FFI-rapport 2008/00312

LTAMC experiments
Assessment of culture and organizational and group processes in a simulated mission

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4 February 2008

FFI-rapport 2008/00312

1084

ISBN 978-82-464-1352-5

Keywords

Organisasjon

Kultur

Gruppeprosesser

NATO Network Enabled Capabilities (NNEC)

Kommunikasjon

Tillit

Språk

Approved by

Hilde Hafnor	Project manager
Vidar S. Andersen	Director

English summary

This report presents the analyses of the data from the NATO HFM RTG – 138 Leader and team adaptability in multinational coalitions (LTAMC) experiments with a focus on organization, group processes, culture, communication, trust and language in a NATO Network Enabled Capabilities (NNEC) context. The experimental set-up was exploratory employing a computer based role-play where the players were connected in a distributed network. Both experimental and survey data was collected.

Results indicated that of the two different measures of national cultural differences employed in this study, the Values Survey Module (VSM) by Hofstede gave most variance, and hence found the most useful for the analyses. When comparing the participating nations' scores on the cultural dimensions, some of them were rather surprising; especially on the Individualism/Collectivism (I/C) dimension. The analyses on group versus individual work strategies in relation to the I/C dimension supported the possibility of there being some problems with the measurement of I/C in military samples. As far as what paid off, group or individual work strategies, it was indicated that the collaborative technological solutions could be what decides what is advantageous. This has implications for developing defense organizations towards NNEC; more team-work may only be advantageous if the collaborative technologies also facilitate this.

There was found higher levels of trust within the national than within the international ad-hoc teams. This result complements and expands on existing research on trust, and suggests a need to invest more time and training in order to build trust within culturally diversified teams in NATO coalitions. This issue becomes increasingly important as the implementation of NNEC advances and collaboration across borders and organizational lines increases. The more culturally different the team composition, the higher will the need be to focus on this.

The amount of communication varied greatly between the teams. Some of the variation was explained by English language capability; the better in English, the more they communicated. This underlines the importance of language proficiency for personnel in NATO operations.

In line with NNEC theories, decentralization and flat organizational structure seemed to be positively related to flexibility, which in turn was related to a positive view of the organization. Surprisingly, in this game environment, respondents also seemed to have a more positive view of the team organization when they experienced it as more hierarchic and centralized. Suggested reasons for this finding were: simple task situation, limited functionality of game communication and information management systems, and military and cultural sample preferences. These findings implicate the importance of having the organization fit both the task and the personnel (both culturally and in terms of training), as well as the information management and collaborative systems being aligned to support the organizational structure and processes. The implementation of NNEC in the Norwegian Defense as well as in NATO makes these issues especially important.

Planning was found to be influenced by English Language ability level as well as by an interaction of two cultural aspects, Power distance (Pd) and Uncertainty avoidance (Ua). There was done the most planning when high Language ability was combined with low Ua and Pd.

Sammendrag

Denne rapporten presenterer analyser av data fra eksperimentene i regi av NATO HFM RTG – 138 Leader and team adaptability in multinational coalitions (LTAMC) med fokus på organisasjon, gruppeprosesser, kultur, kommunikasjon, tillit og språk sett i en Nettverksbasert Forsvar (NbF) kontekst. Det eksperimentelle oppsettet var nybrottsarbeid med bruk av et databasert rollespill med spillere satt sammen i et nettverk. Både eksperimentelle data og survey data ligger til grunn for analysene.

Resultatene viste at av de to målingsinstrumentene på nasjonalkulturelle forskjeller brukt i studien, viste Hofstedes Values Survey Module (VSM) mest varians, og ble derfor foretrukket i analysene. Når vi sammenlignet nasjonenes skårer på de ulike dimensjonene, var det noen overraskelser sammenlignet med tidligere forskning; spesielt på individualisme/kollektivisme (I/C) dimensjonen. Analysene av gruppe versus individuelle arbeidsstrategier opp mot I/C dimensjonen, støttet muligheten for at det kunne være noen problemer med målingene av I/C i militære utvalg. Studien viste videre at hva som lønner seg, å jobbe individuelt eller som team, kan være influert av de teknologiske samhandlingssystemene. Dette har implikasjoner for utviklingen av forsvarsorganisasjoner mot NbF; mer teamsamarbeid er sannsynligvis bare fordelaktig gitt at teknologiene også understøtter dette.

Det ble funnet høyere nivåer av tillit innen de nasjonale enn innen de internasjonale ad-hoc teamene. Dette resultatet komplementerer og viderefører eksisterende forskning på tillit, og indikerer at det er behov for å investere mer tid og samtrening innen kulturelt heterogene enn homogene team i NATO koalisjoner. Dette temaet blir bare viktigere etter hvert som implementeringen av NbF skrider frem og samarbeid på tvers av grenser og organisasjonslinjer øker. Jo mer kulturelt forskjellig teammedlemmene er, jo viktigere vil det bli å fokusere på dette.

Kommunikasjonsmengden varierte mye mellom teamene. Noe av variasjonen ble forklart av forskjeller i engelsk språkkompetanse; jo bedre i engelsk, jo mer kommuniserte de. Dette understreker viktigheten av språkkompetanse for personell i NATO operasjoner.

I tråd med grunnleggende NbF teorier viste dataene at en desentralisert og flat organisasjonsstruktur syntes å være forbundet med fleksibilitet, som videre viste seg å være relatert til et positivt syn på organisasjonen. Men overraskende syntes også våre respondenter å ha et mer positivt inntrykk av teamorganisasjonen i dette spillet hvis de opplevde den som hierarkisk og sentralisert snarere enn flat og desentralisert. Mulige grunner til dette ble foreslått å være: enkle oppgaver, spillets informasjons og kommunikasjonssystemer, og utvalgets preferanse basert på deres militære og kulturelle bakgrunn. Funnene viser hvor viktig det er at organisasjonen er tilpasser både oppgaven og personellet (både i forhold til deres kulturelle bakgrunn og hva de er trent for), samt at informasjons- og samhandlingsverktøyene er tilpasset organisasjonsstruktur og prosess. Implementeringen av NbF i det norske Forsvaret og NATO gjør disse sakene spesielt viktige.

Det ble funnet at planlegging var knyttet til både engelsk språkkompetanse og til en interaksjon mellom to kulturelle aspekter, Power distance (Pd) og Uncertainty avoidance (Ua). Det ble gjort mest planlegging når høy språkkompetanse var kombinert med lav Ua og Pd.

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1 Introduction

FFI projects Collaboration in Networks (SINETT/1084 - current) and Network Based Defense (NBD) in operations (879 - precursor) have contributed to the research conducted in NATO Concept Development & Experimentation (CD&E) project, "Leader and team adaptability in multinational coalitions: Cultural diversity in cognition and teamwork" (LTAMC) / NATO Human Factors and Medicine (HFM) Research and Technology Group (RTG) 138, which has been active in the period 2004-2007. More details on the LTAMC project can be found in FFI travel reports (Bjørnstad, 2007, 2006c, 2004), FFI reports (Bjørnstad, 2005, 2006a, 2006b; Hafnor et al, 2007), FFI note (Bjørnstad, 2006b) and in the LTAMC RTO final report (Sutton et al, 2007).

The LTAMC project members conducted simulated mission experiments using a computer based role play, in the period from April 2006 to May 2007. Cross-cultural cooperation was the main focus in the experiments. Both experimental and survey data was collected.

This report presents the analyses of the data from these experiments on organization, culture, communication, trust, language and group processes. The Norwegian/FFI focus in the LTAMC project has mainly been on organizational and social factors, team cooperation and culture, which aligns with the focus in the FFI projects SINETT and NBD in operations. Analyses and results from the other LTAMC focus areas, alongside some of the results reported here, have been reported in the LTAMC RTO final report (Sutton et al, 2007).

A total of 56 experiments were conducted and 5 nations contributed. The experiments were conducted in Norway (16+6)[1], Sweden (9+6), Bulgaria (8+6), the Netherlands (8+8) and the USA (7+6). 48 experiments (the national experiments) were conducted using local networks while 8 experiments (the international experiments) were conducted on the internet. In Norway, there were conducted a total of 16 Norwegian national experiments, with samples from two different Norwegian military populations, plus 6 international experiments.

[1] The first number in the parenthesis indicate the number of national experiments in each country, with a nationally homogenous subject composition, while the latter number indicate the number of international experiments, with a nationally heterogeneous subject composition, that each country participated in.

2 Problem definition and theoretical background

The issue of culture and organization becomes increasingly important as NATO and Norway aim to implement NATO Network Enabled Capabilities (NNEC) [2] (e.g., NATO HQ SACT, 2004; Forsvarssjefens Forsvarsstudie, 2007). Implementation implicates increased collaboration across borders and organizational lines, augmenting the need to investigate organizational and cultural issues.

Many researchers in the field of cross-cultural psychology have shown how nations vary across different aspects of culture (e.g. Earley, 1997; Hofstede, 1991, 2001; Triandis, 1995; Matsumoto, 2004; Schwartz& Sagiv, 1991). The most well-established and researched theory of cross-cultural differences that we have are Hofstede's dimensions of culturally based values – especially as concerns organizational and work related issues. His work has been corroborated and expanded through numerous other studies, also with military samples (e.g., Adler, 1991; Fernandez et al, 1994; Hoppe, 1998, 1990; Soeters, 1997; Triandis, 1994). The culturally based value-dimensions developed by Hofstede (1991, 2001) are called: Individualism/Collectivism, Power distance, Uncertainty avoidance, Masculinity/Femininity and Long-term/Short-term Orientation. Individualism/Collectivism (I/C) refers to a cultural difference in group as opposed to individual orientation. Group orientation is linked to tight ties between people, whereas individual orientation is linked to loose ties between people. High score indicate individualism (I). Power distance (Pd) is defined as a difference in the actual and experienced distribution of power between people in a hierarchy. High scores indicate high Pd. Uncertainty avoidance (Ua) refers to a difference in need for predictability and rule orientation. High scores indicate high Ua. Masculinity/Femininity (M/F) refers to whether the culture values toughness, assertiveness and a focus on material success as opposed to modesty, concern for others and a focus on the quality of life. High scores indicate masculinity (M). Long-term/ Short-term Orientation (Lt/St) refers to a difference in focus; the present versus distant future. The former indicates a propensity for action whereas the latter indicates a propensity for planning. High scores indicate long-term orientation (Lt).

There are also newer developments in the field, like MeridianGlobal and Matsumoto's six dimensions of culture (MeridianGlobal, 2005), which bare resemblance to Hofstede's dimensions. They have built on existing research in the field and developed the dimensions: Independence/Interdependence, Egalitarian/Status, Risk/Restraint, Direct/Indirect Communication, Task/Relationship, and Short-term/Long-term Orientation.

[2] As NNEC it is the term employed in NATO documents, this is the term that will be term employed in this report. The author does not differentiate between this and the term most often employed in Norway, "Nettverksbasert Forsvar" (NbF).

Two of the many areas culture affects are organizational and team behavior (e.g., Earley, 1997; Hofstede, 1991, 2001; Triandis, 1994). Organization structure as well as national culture, have an impact on team processes. For instance, how is organizational and team structure affecting processes as well as being influenced by culture? Areas of focus here include: hierarchy, centralization, flexibility, cooperative strategies and planning.

As information is crucial to any organization, and especially to an information-heavy environment like an international military organization, we aimed to get a better understanding of how information is shared in a simulated mission. Areas of focus include communication, information sharing and impediments for information-sharing.

Trust is important both for the organizational functioning and the sharing of information. Is the level of trust the same in national and international groups? And does the cultural make-up of personnel influence their level of trust in team-mates, as suggested by the work of Triandis (1995) and Cox et al. (1991) – and if so, how? We aimed to explore such themes in the experiments conducted.

Finally, we wanted to find out more about how and if English language ability affects organizational and cooperative processes. There are ample indications from multinational military settings that language proficiency (English) may be affecting organizational processes as well as information-sharing (see e.g., Bjørnstad 2005, 2006a & b). We wanted to test this, expand our understanding of the effects of language, as well as control for the effects of language, to avoid confusing language proficiency with culture in the analyses.

3 Method

3.1 Participants

There were a total number of 224 subjects participating in the experiments, 4 in each experiment. The experiments were conducted with participants from 5 nations; 48 of the groups were culturally homogenous (i.e. same nationality) while 8 of them were culturally heterogeneous (i.e. different nationalities). All participants were military officers, with the rank of OF-1 to OF-5[3], 117 male and 7 female, aged from 19 to 57[4]. In Norway, there were conducted two series of national experiments, with samples from two different Norwegian military populations (one from a graduate and one from an undergraduate military college). Drawing from two different populations in the Norwegian national experiments will help us control for other group differences than national cultural differences when making the analyses. The organizational

[3] NATO standard. 4,9 % had ranks just below OF-1.
[4] Mean age 31, with a standard deviation of 7,6.

questionnaire was not activated in the Swedish (9), Bulgarian (8) and in 5 of the Dutch national experiments, rendering organizational survey data from 34 experiments[5].

3.2 Materials

In order to study the different issues related to cooperation in multinational teams in a controlled environment, LTAMC chose to employ a computer based role play (NeverWinter Nights, NwN), adapted for our research purposes (Situation Authorable Behavior Research Environment, SABRE), as the main instrument, the method being both explorative and innovative. The SABRE game world is a modern urban environment without magic or violence. There can be 4 players on-line simultaneously in addition to an invisible character, the Dungeon Master (DM). The DM was controlled by the experimenters and was included in order to allow us to monitor the experiments.

There were six computerized surveys distributed before, under and after the experimental game session. Four pre-game computerized surveys were administered on background[6], personality (NEO-PI[7]) and culture (GCS[8] and VSM-94[9]). During the experiment session, the subjects were at three different times in the game interrupted by a prompt to answer questions measuring their Situation awareness (SA). 2 surveys were administered after the experimental game session was over, called debriefing questionnaires 1[10] and 2. These were constructed for the purpose of the LTAMC experiments.

Debriefing questionnaire 2 (Db2) is an organization questionnaire containing 36 organization related questions. Questions were reviewed by peers and revised on the basis of feed-back from the subjects in two pilot studies conducted in Norway prior to the first experiments. The Db2 questions were constructed on the basis of the organizational survey previously developed by the author at FFI in relation to the LTAMC work and employed in field studies (AW04[11], BG05[12], MNE4[13]: see Bjørnstad, 2005, 2006a, 2006b). The questions covered topics such as organization (hierarchy, centralization, leader behavior), decision-making, work-load, trust, information-sharing, communication and language. The questionnaire is included in Appendix (A.3).

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[5] N=133, 3 missing values total.
[6] Including demographics (age, gender, education level, rank, etc), language and computer use/knowledge. Questions are included in Appendix (A.1).
[7] Short version of Costa & Mc Crae's NEO Personality Inventory (Costa & Mc Crae, 1989, 1992). As reproduction is prohibited by the Publisher, Psychological Assessment Resources (PAR), Inc, the survey is not included in Appendix.
[8] MeridianGlobal and Matsumoto's Globesmart Commander Survey (MeridianGlobal, 2005).
[9] Hofstede's Values Survey Module (Hofstede, 1991, 2001, 2007).
[10] Debriefing questionnaire 1 is a general survey asking 51 questions from the game. It is included in Appendix (A.1).
[11] NATO Response Force (NRF) exercise; Allied Warrior 2004 (reported in Bjørnstad, 2005, 2006a).
[12] NATO winter exercise in Steinkjer, Norway; Battle Griffin 2005 (reported in Bjørnstad, 2006b).
[13] Multi National Experiment 4 (results not yet reported).

Culture was operationalized as Hofstede's value dimensions, and his tool, The Values Survey Module (VSM) chosen for measurement. VSM is a self-report measure with 20 questions measuring 5 dimensions of culturally determined values (as presented in chapter 2). The current VSM (VSM 94) is the result of many years of continuous research that started with the seminal work of Hofstede in the 1966-73 IBM survey of the work-related values and attitudes of 116 000 IBM employees (Hofstede, 1991, 2001, 2007), and is today the most extensively validated instrument we have to measure cultural differences (e.g., Adler, 1991; Hoppe, 1990, 1998; Triandis, 1994; Soeters, 1997). The VSM survey does not measure culture at an individual level – it has been validated to measure culture at the level of countries or regions. The questionnaire is included in Appendix (A.4).

Additionally, culture was measured through the newly developed instrument; MeridianGlobal and David Matsumoto's Globesmart Commander Survey (GCS), adapted for military samples (www.meridianglobal.com; Matsumoto, 2004; Matsumoto et al, 1997; Strathman et al, 1994). The questionnaires give scores on six dimensions of cultural values and attitudes (as presented in chapter 2). For a more in depth description of the dimensions, validation, comparisons of the Hofstede and the Matsumoto dimensions and scales, please be referred to Bjørnstad (2006a). The GCS is intended to be used on an individual level, but has as of yet not been validated at any level. The questionnaire is included in the Appendix (A.5).

3.3 Procedure

3.3.1 Experimental set-up and execution

The national experiments were conducted within local networks while the international experiments were done over the internet. The experiments were timed to one hour, but subjects were in for 5-6,5 hours on the experiment day, including getting a brief before starting, game learning and planning sessions, completing surveys, and receiving a debrief in the end.

In the experimental set-up for the homogenous/national teams, the 4 subjects in each group were randomly assigned to a computer and a game character. There were 5 computers (laptops) total, four client machines and one server set up in a local network. We (the experimenters) controlled the server. Figure 3.1 shows the technical set-up for the local experiments.

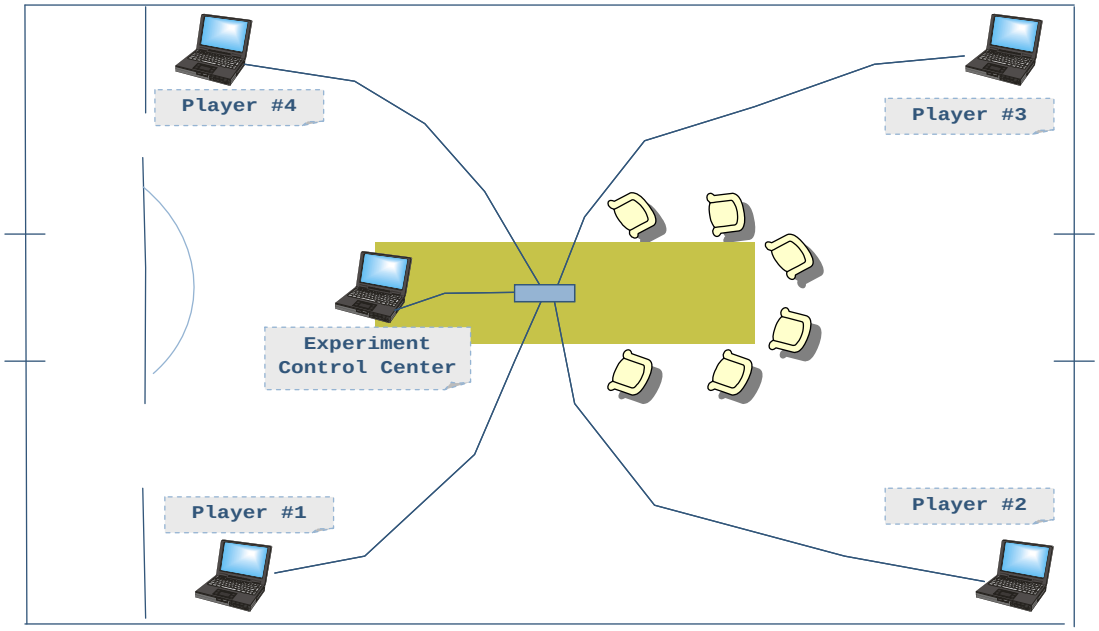


Figure 3.1 Technical set-up of the homogenous/national team experiment (in Norway).

In the experimental set-up for the heterogeneous/international teams, the 4 subjects in each group were randomly assigned to a character in the game. There were 5 computers total, four client machines and one server connected through internet. BBN-technologies controlled the server.

The game started with a tutorial program, aimed at teaching the subjects how to play the game. In the second part of the tutorial session, the players were brought together and taught how to communicate. The subjects would proceed at their own speed in the tutorial session, which made the tutorial last from 1-2 hours, depending on the subjects' own speed. Before the real experimental session started, there was a so-called "planning session" where the players were guided through planning and dividing of equipment by different game instructors. At the end of this, the players entered into the play's experimental scene, at which time the experimental session started - timed to exactly 1 hour.

3.3.2 Game scenario

Every participant/subject controlled a game character throughout the game. In the training session they were simply called Trainee 1-4, whereas in the planning and experimental sessions they were given names (William, Frank, Jacob, and Nathanial). There were no obvious moves in the game (like for instance in chess).

When the subjects started the planning session they were informed that one of them was the team leader. This was randomized.

In the experiment session, the subjects' characters would be in a modern urban environment where their mission was to find weapons hidden in crates ("caches"), which would give the team points (so-called "goodwill points")[14]. There were no individual scores, but when someone gained points everyone was informed when this happened and by whom. In order to do their mission they had a set of tools to help them out. These were scarce, so as to promote cooperation between the players. The distribution of the tools was done by the players.

Communication between the players was limited to chat, there was no voice communication. There were two different chat functions, one short-range and one long-range. With the short-range chat the players could "talk" to all the characters in their closest vicinity whom would all "hear" simultaneously. With the long-range chat the players could only "talk" to one at the time, but were not limited by distance.

4 Results

4.1 Language

English language proficiency level is deemed to affect team processes. It was measured through the average of 4 questions in the background questionnaire. An internal consistency test of these questions showed very good reliability; Cronbach's Alpha = .895. See table 4.1 for details.

Table 4.1 Language ability scale items: Item reliability.

Questions	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Is English your native language?	,754	,886
How would you rate your ability to read and write in English?	,729	,897
How often do you feel that you get more stressed when working in an English-speaking environment rather than in your native language?	,860	,831
How often do you become more reserved about presenting your point of view in English than in your native language?	,842	,836

N=223[15].

[14] The players could both gain and loose points in various degrees depending on their actions.
[15] One missing value.

35 out of 224 subjects were native English speakers, the rest having Norwegian, Swedish, Dutch and Bulgarian as their native languages.

The language ability level of the different groups are shown in the chart below (Figure 4.1)

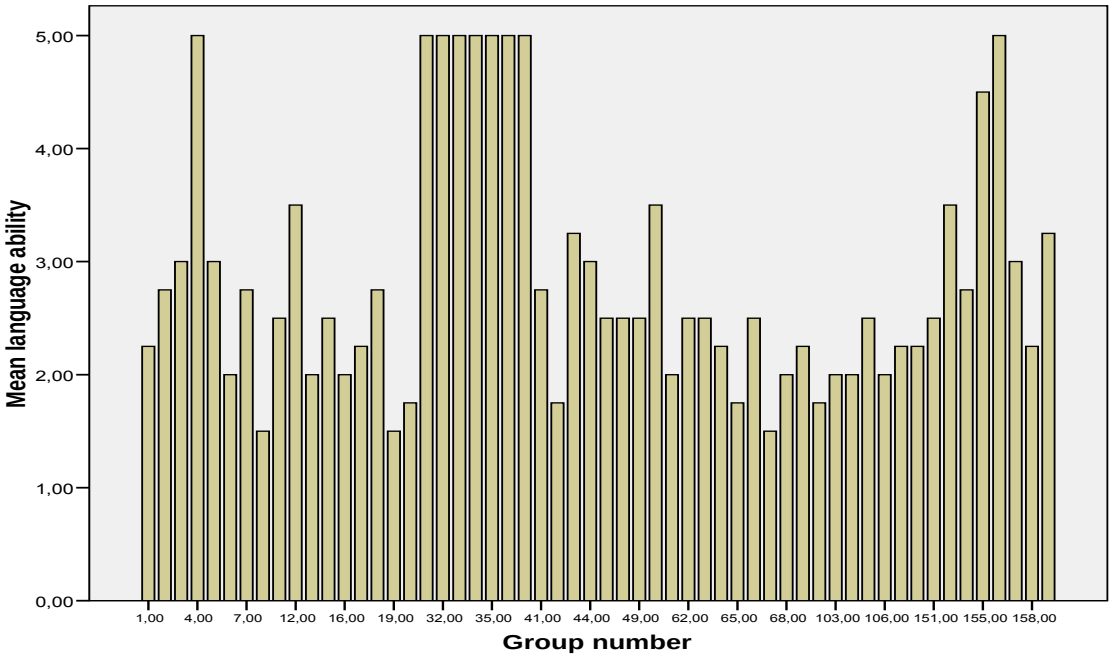


Figure 4.1 Language ability at the group level.

Language ability was expected to have an effect on team cooperation and group processes. We therefore wanted to be able to better understand, as well as control for this, in order to more correctly interpret for instance the effects of culture.

At the individual level of analysis, language ability was found to be negatively related to finding language an obstacle for sharing information (β=-.431, p<.001); Language ability (individual) explaining 19% of the variance in the rating of language as an obstacle. At the group level, language ability explained 31% of the variance in the rating of language as an obstacle for information sharing (β=-.560, p=.001).

Comparing non-native English speakers (NNES) and native English speakers (NES), strengthens this finding; NNES score about 65% higher than the NES, which difference is significant at the .000 level. The difference is portrayed in Figure 4.2. The figure also shows that there was little difference between the national and the international groups.

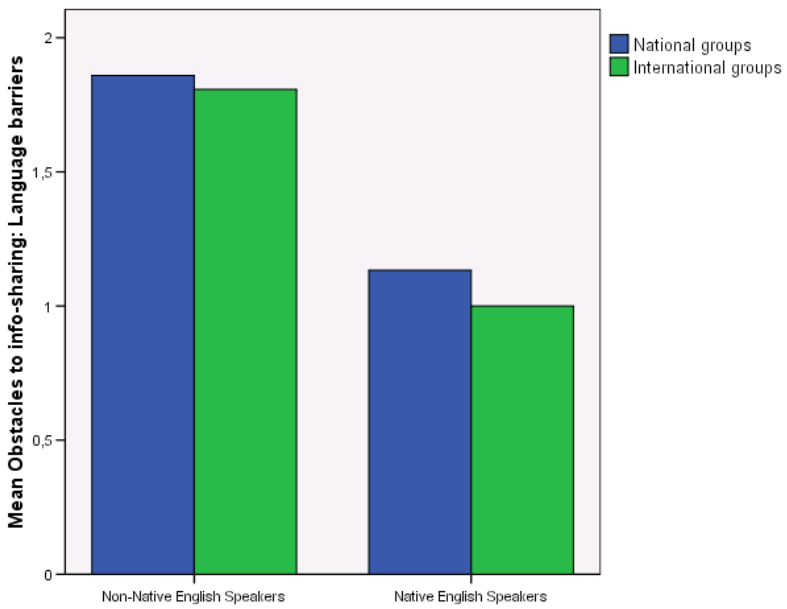


Figure 4.2 NNES and NES rating language as an obstacle for information sharing.

4.2 Culture

As indicated above (chapter 3.2), culture was measured using the VSM (Hofstede) and the GCS (Matsumoto). Figure 4.3 shows the VSM/Hofstede cultural scores by nationality, while 4.4 shows the scores by dimension.

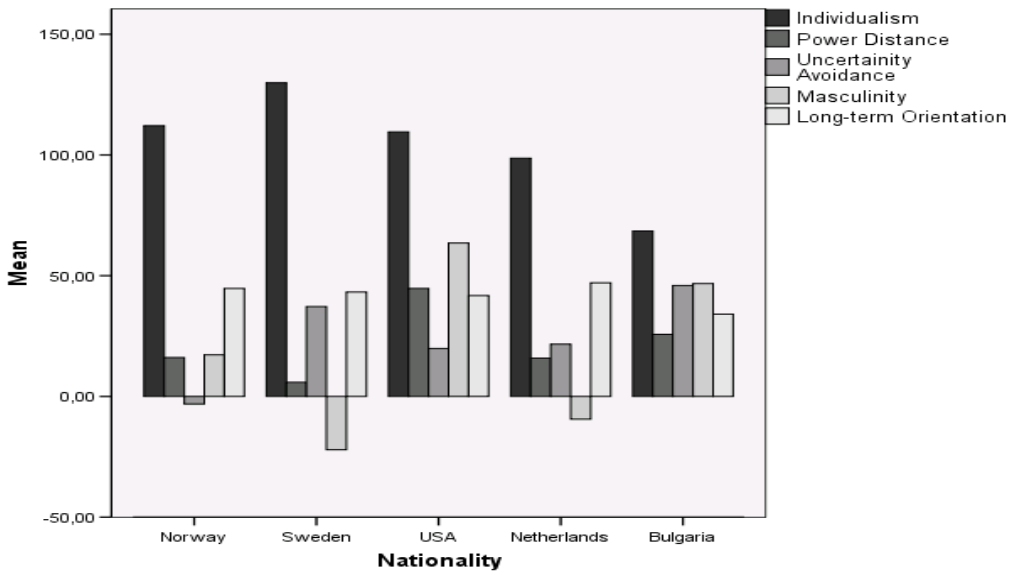


Figure 4.3 Culture scores (Hofstede) by country (N=221).

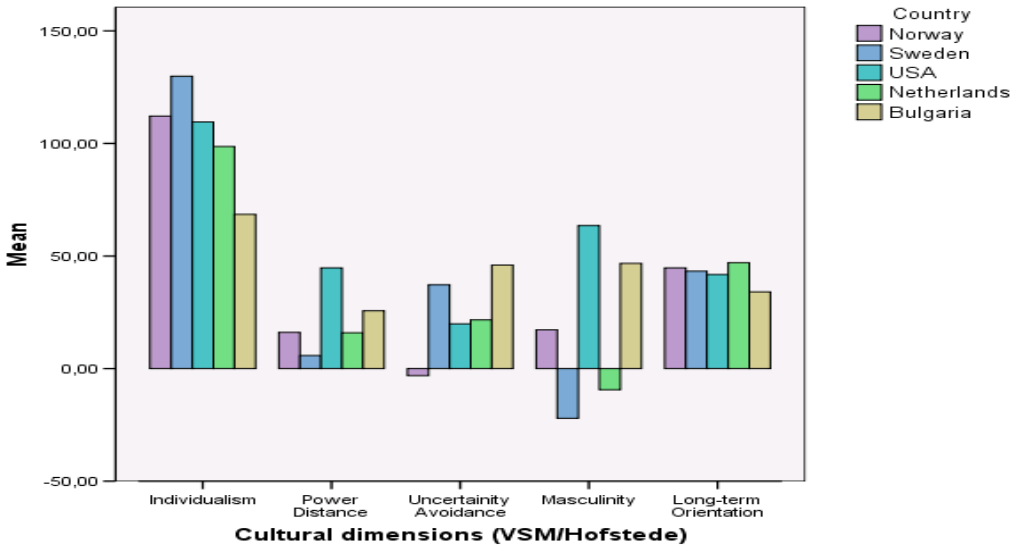


Figure 4.4 Culture scores (VSM/Hofstede) by dimension (N=221).

As anticipated from previous studies, Figures 4.3 and 4.4 indicate some obvious similarities between the cultural make-up of Norway, Sweden and the Netherlands. Bulgaria scores the most different amongst the participating nations.

Figure 4.4 demonstrate that there is the most variance between the countries on the masculinity dimension, while the long-term/short-term orientation dimension has the least variance.

Figure 4.5 below shows the GCS/Matsumoto cultural scores by dimension. It becomes clear when comparing with Figure 4.4 above that the VSM/Hofstede scores demonstrate the most variance between the countries on the dimensions. This should make it more applicable in the subsequent analyses.

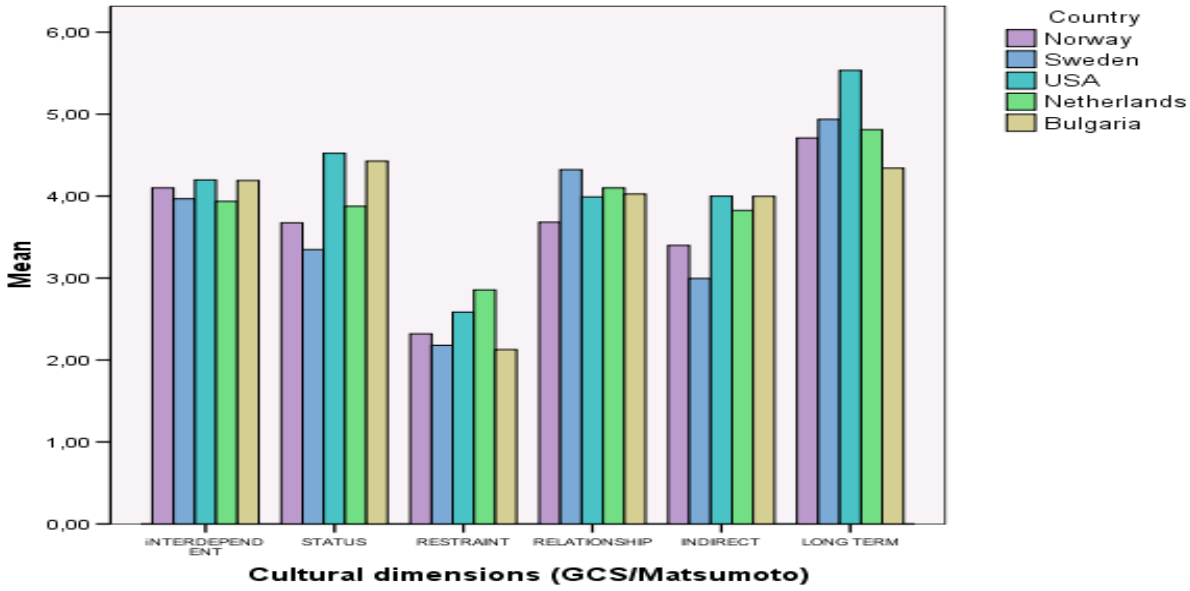


Figure 4.5 Culture scores (Matsumoto) by country (N=221).

As anticipated, due to the low variance in the GCS, there were found no correlations with any of these cultural dimensions and the choice of reward strategy (question from the Debrief 1 questionnaire: Db1). With the VSM, on the other hand, there seemed to be some relationships to culture (Figure 4.6). Surprisingly, persons from nationalities scoring high on individualism tended towards the choice "divide equally" (r=-.212, p=.002). The strengths of the relations are shown in table 4.2.

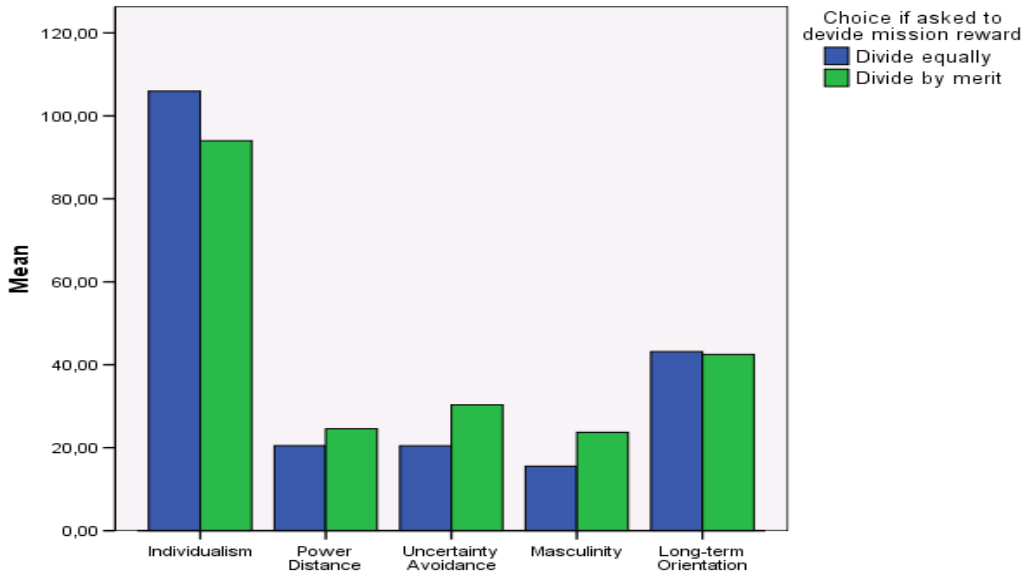


Figure 4.6 Reward strategy by culture (VSM).

Table 4.2 Correlations: Reward strategy with culture (VSM). 1=divide equally, 2=divide by merit.

VSM Dimensions		If you were asked to divide up a mission reward the team was given between the team members, how would you prefer to divide it?
Individualism	Pearson Correlation	-,212(**)
	Sig. (2-tailed)	,002
Power Distance	Pearson Correlation	,123
	Sig. (2-tailed)	,067
Uncertainty Avoidance	Pearson Correlation	,174(**)
	Sig. (2-tailed)	,010
Masculinity	Pearson Correlation	,098
	Sig. (2-tailed)	,146
Long-term Orientation	Pearson Correlation	-,199(**)
	Sig. (2-tailed)	,003

** Correlation is significant at the 0.01 level (2-tailed). N=222.

We also wanted to see if the choice of words, like the pronouns “I” and “we” would be related to I/C, in terms of Individualism being related to the use of “I” and Collectivism related to the use of “we”. The relationship found was in the opposite direction, rather weak and only almost significant (further presented in chapter 4.6). There was also found links between choice of pronouns (I/we) and work strategy (also presented in chapter 4.6).

4.3 Trust

Trust, defined as task related confidence in team-members, was expected to affect team processes, and possibly also be linked to culture. Team trust was measured through 3 questions in the Debrief 2 questionnaire (Db2) [16]. Internal consistency test shows satisfactory reliability of the measure; Cronbach's Alpha = .714. See table 4.3 for details; mean score was computed on the basis of the items listed.

[16]As the Db 2 questionnaire had failed to be activated in the Bulgarian, Swedish and approximately half of the Dutch national experiments, we lack data on the measurements of trust from these. Therefore, N=133.

Table 4.3 Team trust: Items and reliability of measure. N=133.

Items	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
How confident were you that team members would assist you if you needed help?	,548	,610
How confident were you that team members would fulfill their responsibilities?	,490	,676
How confident were you that your team members would share important information with you?	,569	,579

Answer categories: 5-point scale from very confident to very doubtful.

Figure 4.7 below shows the distribution of answers on trust in all the experiments while Figure 4.8 shows the distribution of answers on trust split in national and international experiments. The latter indicates higher trust within the national than within the international groups. The difference in mean scores was 0.7 on a five-point scale, p<.001. The lack of answers from all countries in the national experiments was controlled for[17].

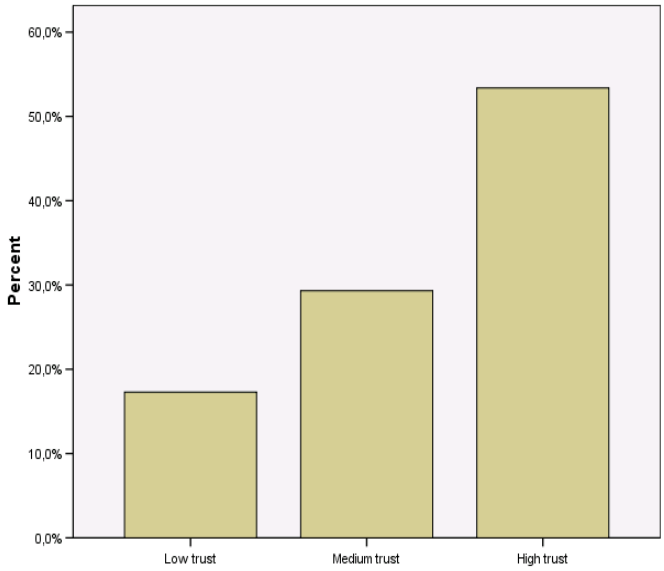


Figure 4.7 Distribution of answers on team trust in all experiments. N=133.

[17] As we had no data on trust from the Bulgarian and Swedish national experiments, the data from the Bulgarian and Swedish participants in the international experiments were excluded when comparing the national and international groups, in order to have matched samples for comparison purposes. Therefore, N=121.

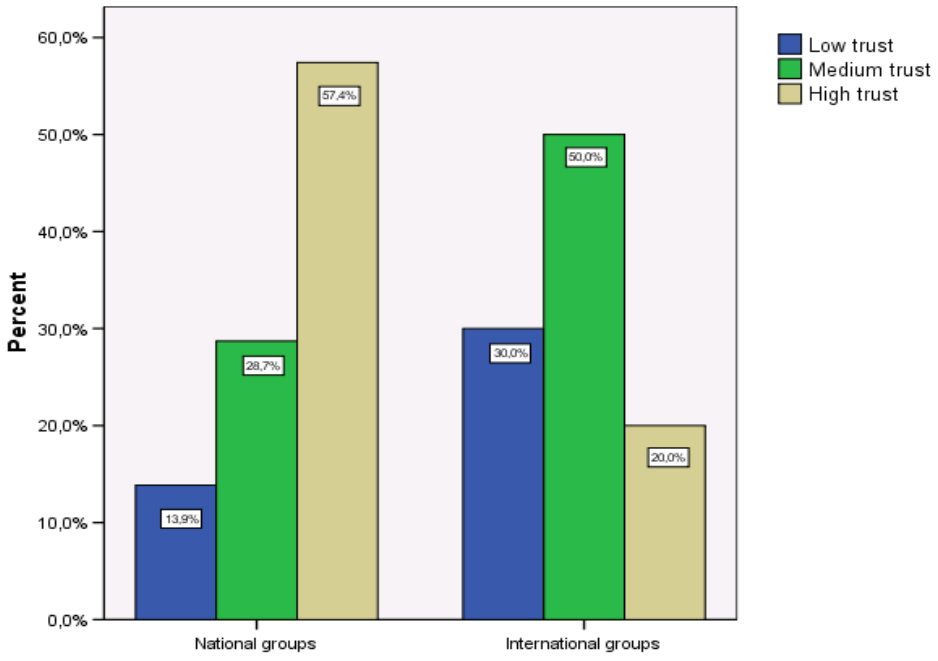


Figure 4.8 Trust within nationally homogenous groups and nationally heterogeneous groups. N=121.

Trust was not found to be related to choice of reward strategy ("divide by merit/equal"). It was expected that trust may be related to the Individualism/Collectivism (I/C) dimension of culture, but there was found no such relationship in our data. In the analyses it was checked for correlations in the sample both as a whole, as well as within the national (homogenous) and international (heterogeneous) groups separately. We also expected that there might be a difference in trust in leader and team-mates depending on Pd. There was only found a relationship between trust in team and high Pd (r=.253, p=.003), which was rather contrary to our expectations. We therefore split the file into leaders and team-mates (non-leaders) and found that this effect was only found for team-mates (non-leaders) (r=.283, p=.004). We also checked for a relationship between Pd and trust in subordinates (i.e. leaders' trust in team-mates); there was found no relationship. There was also checked for any relations between trust and the GSM measures on the Independence/Interdependence and the Equality/Status dimensions, but no relations were found. In sum, what was found in relation to culture was a tendency for subordinates, but not leaders, from high Pd cultures to show higher trust in peers than those from low Pd cultures.

4.4 Communication

Team-members communicated through chat. This was also the main tool for information-sharing. The total number of chat messages written per group varied greatly. This is shown in Figure 4.9 below.

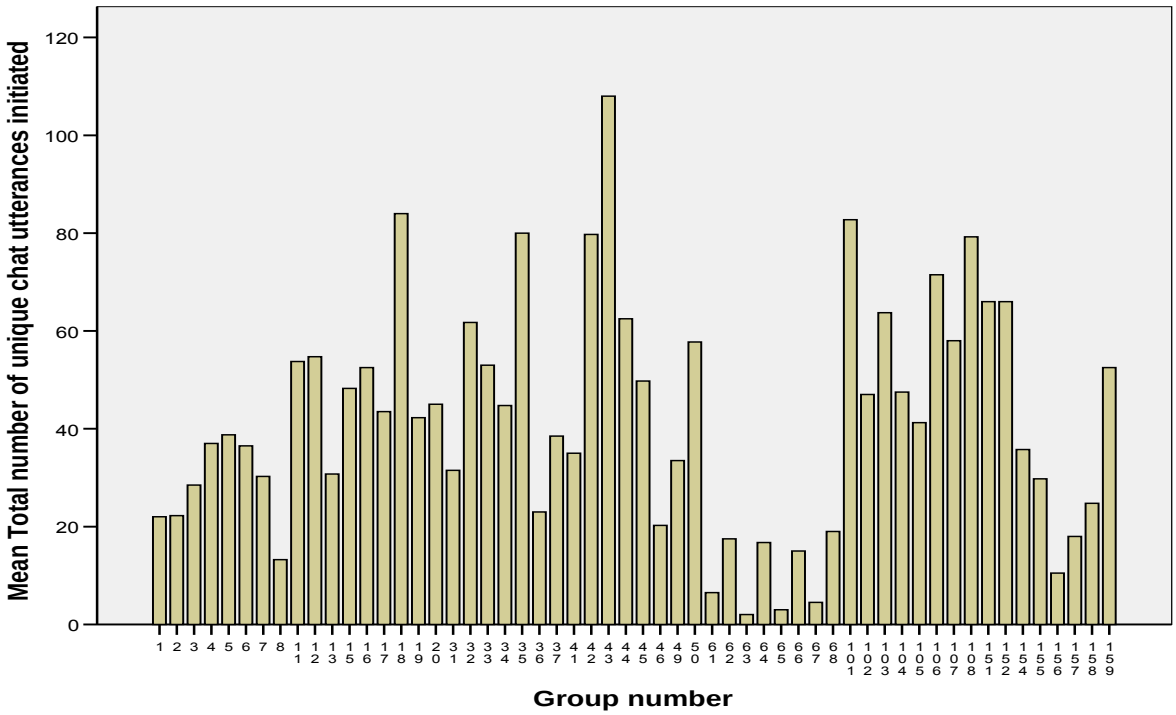


Figure 4.9 Group-wise mean number of chat messages written. National groups (No 1-8 & 101-108; Se 11-20; US 31-37; Ne 41-50; Bu 61-68): 1-108 (48 groups), International groups 151-159 (8 groups).

The table below, 4.4, shows the relationship between language ability and chat messages written. As expected, language ability did influence the number of chat messages written, but explains only just over 3% of the variance at the individual level of analysis. This relationship was weaker and non significant at the group level, due to the within group variance being quite important.

Table 4.4 Correlations: Language ability and chat messages written.

	Average Language ability
Total number of chat messages	,180(**)
Sig. (2-tailed)	,007

** Correlation is significant at the 0.01 level (2-tailed). N=223.

It was expected that numbers of chat messages written would be related to the general computer proficiency level[18] as well as to how much the subjects usually spent playing multiplayer computer games such as this one used in our experiments. It turned out that chat was related to both computer proficiency in general (r=.170, p=.011) and more specifically to game playing (r=.275, p<.001). Game playing explained about 8% of the variance in chat. The same relations showed up also at the group level.

At group level of analysis only there was found a significant correlation between amount of communication (chat) and the number of transactions made in the game (i.e. actions causing both gains and losses of game points) (r=-.445, p=.001), between chat and the average game points pr transaction (r=.395, p=.003). This may indicate that chat takes up time so that less points transactions are made, but that the transactions made are done with better judgment/information available (i.e. better decisions), hence giving more plus-points and less minus.

It was also expected that communication, operationalized as chat, would be related to culture. It was found that chat was significantly correlated with Individualism (I/C: r=.328, p<.001), Uncertainty avoidance (Ua: r=-246, p<.001), and Masculinity (M/F: r=-.185, p=.006) at the individual level of analysis. At group level the relations were stronger for I/C (r=.434, p=.002), and M/F (r=-.366, p=.006). These findings indicate that subjects from cultures high on individualism, low on Ua and feminine, were likely to communicate more.

4.5 Organization (hierarchy, centralization, leader behavior)

In the Debrief 2 questionnaire, we asked questions on perceived structure (hierarchy) and centralized/decentralized processes. Figure 4.10 and 4.11 show the distribution of answers to these questions from all groups[19]. As can be seen from these figures, a majority of subjects found the team structure to be flat and the team processes to be decentralized.

[18] Computer proficiency level is an index score based on the average of 9 questions relating to different types of computer use. (Cronbach's Alpha = .603). However, as the questions are not meant to reflect a latent variable, but rather to comprise a formative scale, the relatively low α does not pose a problem.
[19] As previously indicated, we were lacking data on the Debrief 2 questionnaire from Sweden and Bulgaria on the national experiments; hence, N=133.

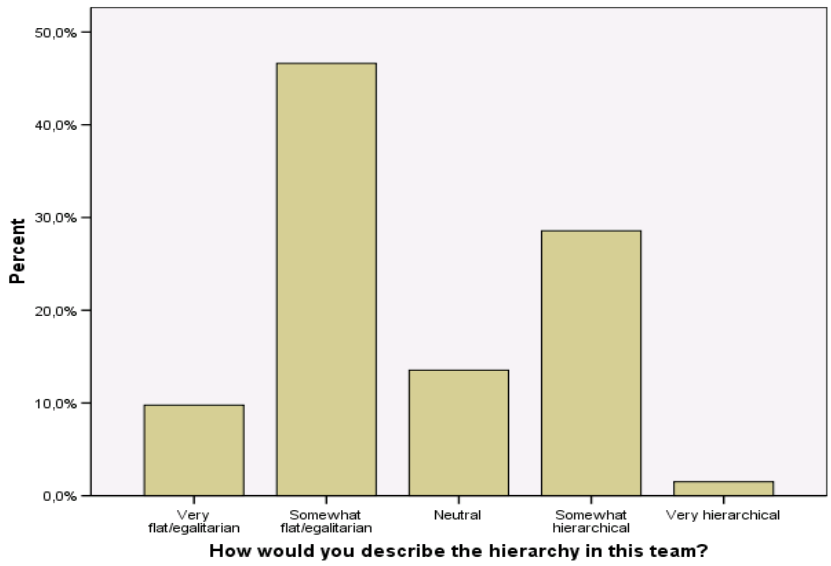


Figure 4.10 Perceptions of hierarchy in national and international groups. N=133.

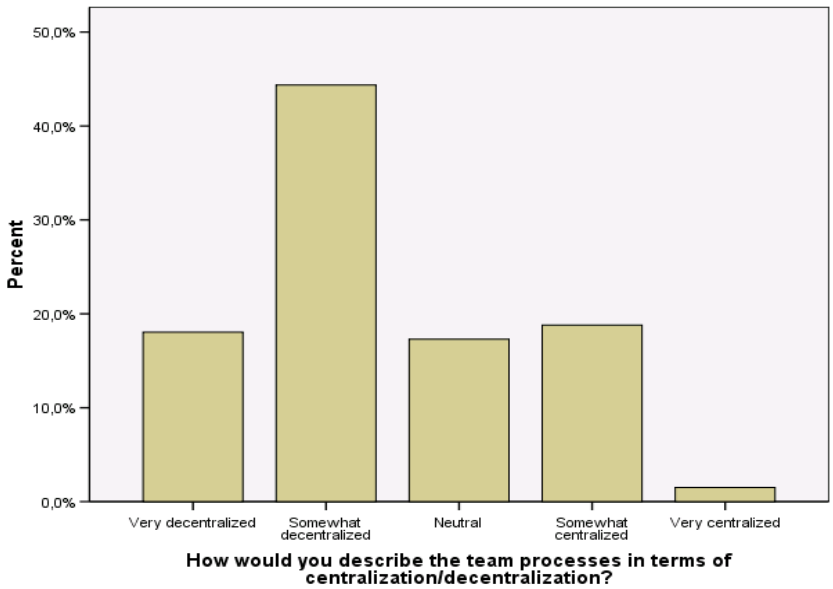


Figure 4.11 Perceptions of centralization/decentralization in national and international groups. N=133.

There were found significant correlations between perceptions of hierarchy, centralization, rating the organization, and Pd, including both national and international groups (N=133)[20]. Flat structure & decentralization was positively related (r=.454, p<.001). In turn, flat structure & decentralization were each related to flexibility (flat structure & flexibility: r=.230, p=.008; decentralization & flexibility: r=.247, p=.004). Doing a regression analysis gave the following model (Figure 4.12), explaining 8% of the variance in flexibility (p=.005)[21]. The same

[20] Looking at the same for the international groups only, gave the same relations, just a bit stronger.
[21] Each of the independent variables' beta values were only almost significant (p_1=.119, p_2=.060).

relationships turned up when the analyses were done at the group level; the relationships were even somewhat stronger while not significant at the .05 level (flat structure & flexibility, β=.190; decentralization & flexibility, β=.293, R^2=.151, p=.078, N=34).

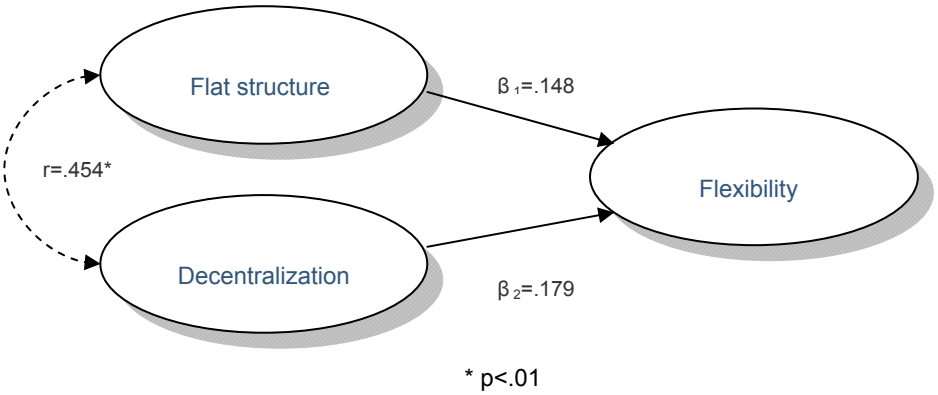


Figure 4.12 Model: predicting flexibility through the organizational variables flat structure and decentralization

Flat structure as well as decentralization were, however, negatively related to rating the organization positively in our experiments (r=-.368, p<.001; r=-.389, p<.001). In other words, respondents seemed to have a more positive view of the team organization when they experienced it as more hierarchic and centralized[22]. The same tendency was found both for those who had previously spent a lot of time playing computer games as well as for those that had played little or nothing. But the correlations were somewhat stronger for those who had played more games.
A regression analyses was also performed, as visualized in Figure 4.13. The model explains 20% of the variance in rating (p<.001).

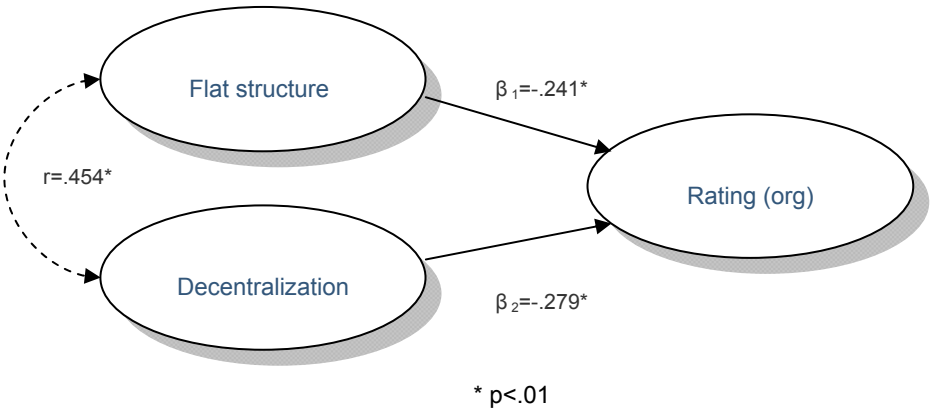


Figure 4.13 Model: predicting organizational rating through the organizational variables flat structure and decentralization.

[22] These analyses proved to give almost the same numbers when done at the group level.

It was also checked if organizational structure and process was related to output, in terms of game points. There was found a significant correlation at group level only: game points pr transaction was positively related to hierarchy (r=.371, p=.031), indicating that a hierarchic organization paid off in the game.

Qualitative and quantitative data indicated that the game may have had an influence on the team-processes. Figure 4.14 shows that almost all respondents indicated that the game tools did influence group processes.

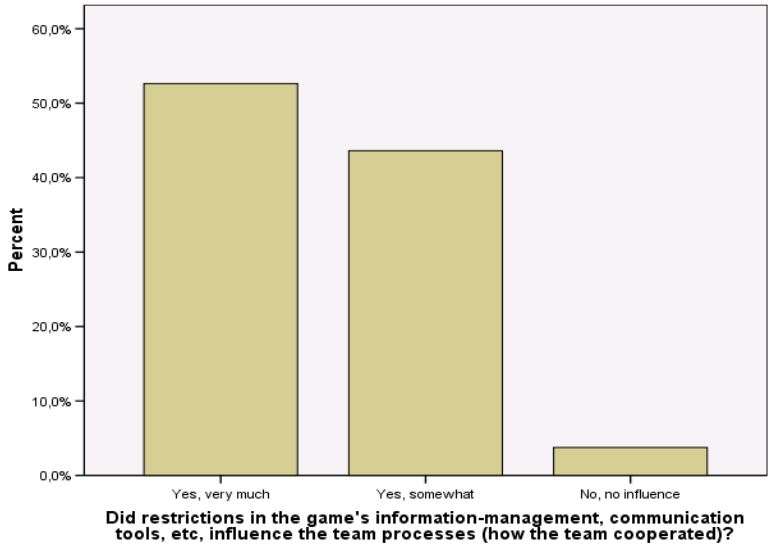


Figure 4.14 Game influence on group processes. N=133.

Communication could for instance only take place to all other players at the same time if they were standing in each others vicinity in the game, otherwise they would have to type the same message repeatedly to all.

The quantitative data were very mixed when it came to *how* the game affected the process. As Figure 4.15 shows, there were no overweight of subjects finding the game to induce more centralized processes.

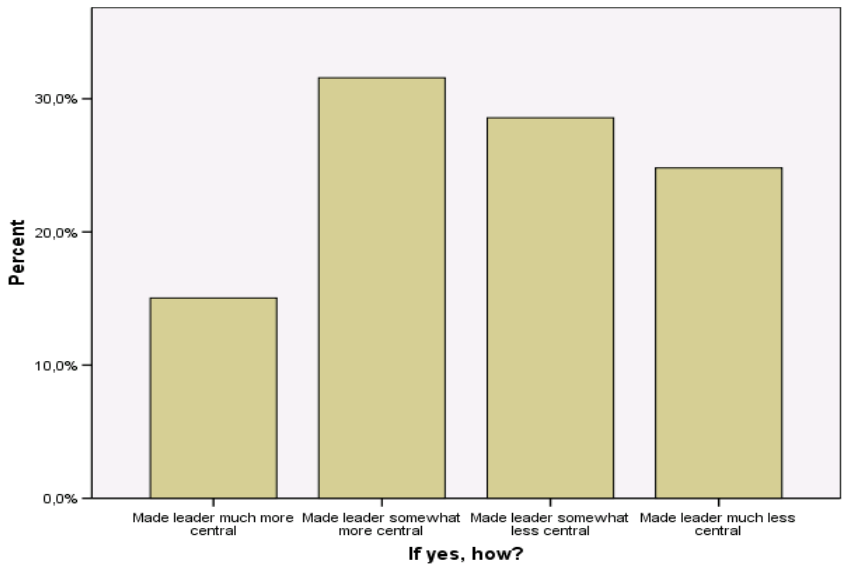


Figure 4.15 Game influence on group processes and its effect on leadership. N=133.

However, looking at the answers to what constituted the greatest obstacles for sharing information, "technical difficulties/game interface" is rated the highest. This variable ("Obstacles infoshare: technical") is significantly positively related to "Game influence on team processes" (r=.199, p<.021), meaning "Obstacles infoshare: technical" may be understood as explaining about 4 % of the variance in "Game influence on group processes".

Furthermore, "Game influence on team processes" was positively related to the variable indicating whether the information management and distribution tools influenced whom the players communicated with, "Tool influence on communication" (r=.312, p<.001); explaining about 10% of the variance.

Regression analysis showed that 14 % of the variance in "Game influence on team processes" can be explained by the two variables, "Obstacles infoshare: technical" and "Tool influence on communication" together (R^2 = .144, β_1=.216, p_1=.003, β_2=.323, p_2<.001[23]). The analyses show that the two independent variables, "Obstacles infoshare: technical" and "Tool influence on communication" were not correlated. These analyses indicate that team members experience team processes, including both communicational patterns and sharing information, to be influenced by the technological solutions in the game.

Qualitative comments indicate that subjects often found the communication through chat and the information management system to be cumbersome and take too much time: "*Not being able to*

[23] Individual level of analysis.

communicate with everybody at the same time while not within range of sight slowed things down." and "*The information management system was difficult* (..).".

Subjects also pointed to that there was some confusion: "*Without clear tasks, I was not sure who to send the information too, or request help from.*" and "*Information overload and poor communication/planning made everyone run around solving individual tasks with no clear plan*.". But finally, many indicated that it was advantageous to have hierarchic/centralized organization in the game: "*Power goes up because the game implicates having a leader*", "*It was cumbersome to cooperate decentralized in the game (...) it favors hierarchy*." and "*Command and control was needed, but not present*.".

The comments suggest that playing may have been more time efficient, as well as less chaotic and confusing if the team organization was more hierarchic and centralized. The very last comment could also indicate that our subjects interpreted the game organization in light of what they are used to in their military organization.

In terms of relationship to culture, it was expected that perceptions of hierarchy, centralization, and rating the organization might be related to Power distance (Pd). There were found correlations only between Pd and rating the organization: r=-.193 and p=.026. This means that there was a small tendency for subjects from high Pd cultures to rate the team organization more positively than those from low Pd cultures. It was expected that Pd may interact with hierarchy and centralization on how subjects rated the organization. This was not found.

There was not found any significant relationship between rating the organization and Uncertainty avoidance (Ua) (r=-.151, p=-.084).

It was also checked whether the Globesmart measures on the dimension Egalitarian/Status would yield any relationship to the rating of organization; this was not found. Even though the Globesmart measure should be better suited than the VSM measure due to it (in theory at least) being adapted for the use of individual scores in the analyses, there is a lack of variance in the scores that makes it difficult to use in the analyses.

Additionally, there was checked for a relationship between micromanagement and Pd. It was expected that high Pd would increase the probability for micromanagement. Micromanagement was measured through three questions relating to degree of leading, taking over responsibilities and increasing supervision (questions 10, 15 and 16 in the Db2 questionnaire; see appendix, A.3). The first question was left out as it gave a better reliability score with the latter two questions only (Chronbachs Alpha = .70). There was only found a weak non-significant relationship at the individual level between Pd and Micromanagement. As one should expect that it is primarily the Pd of the leader that will influence micromanagement and Pd of the subordinates that will

influence how the subordinates interpret the micromanagement, the relationship between Pd leader and Micromanagement, controlled for Pd subordinate, was computed. Regression analysis gave no significant results. Because in the national groups, leader and subordinate Pd would be the same (Pd is measured at the national level), the analyses was also conducted with international groups only (N=24). None of the analyses gave significant results. Hence, no link was found between micromanagement and Pd.

4.6 Work strategy, performance and culture (I/C)

Location (co-location/individual) and culture (I/C)
In the game, the players could choose different strategies for solving the task they were given; they could move around and work alone (1+1+1+1), or together in any constellation (4, 2+2) or a mix between working alone and together (3+1, 2+1+1). We expected that the choice of independent or cooperative strategies would be affected by culture on the I/C dimension. Collectivism describes a culture where people are more used to thinking and working in groups while Individualism describes a culture where people are more used to thinking and working individually (Hofstede, 2001).

In the experiments we measured work strategy mainly through location; in which degree the team members were moving around alone or together (co-location) in the game. Co-location turned out to be significantly related to individualism both at the individual level ($r=.244$, $p<.001$) and almost significant at group level of analysis ($r=.259$, $p=.054$), indicating that the subjects from individualist cultures tended to work more together in teams than subjects from collectivist cultures. This was contrary to our expectations.

Location and performance (Game points achieved)
There was found a significant negative relationship between location (co-location) and performance, measured by game points achieved at the group level of analysis ($r=-.271$, $p=.044$). Location (co-location) was furthermore significantly related to the number of game points transactions made in the game at both individual ($r=-.280$, $p<.001$) and group ($r=-.544$, $p<.001$) levels of analysis. At the group level, location explained 7% of the variance in performance and 30% of the variance in transactions. The results indicate that the individuals and teams having chosen a more individual work strategy were more active in terms of both gaining and loosing points in general, in turn also ending up with higher net team game points scores.

Regression analysis was performed in order to see whether there was an interaction effect between individualism and work strategy (co-location) in relation to performance. There was found no such relationship. The analysis only showed a direct effect of work strategy upon performance. However, individualism was, as presented above, found to influence work strategy (co-location), and this suggest an indirect effect of individualism on performance through work strategy, as presented in Figure 4.16.

Figure 4.16 Model of relationship between I/C, work strategy/co-location and Performance.

Location and chat

The choice of location (co-location) was significantly positively related to the number of chat messages written at both individual (r=.478, p<.001) and group (r=.592, p<.001) levels of analysis. More specifically, co-location was significantly and strongly positively related to "talk" (message sent collectively to everyone in the vicinity) at both individual (r=.694, p<.001) and group (r=.803, p<.001) levels of analysis, while quite a bit weaker and negatively related to "tell" (one to one, long distance) (ind level: r=-.158, p=.018, group level: r=-.210, p=.121). This means that subjects staying together as a group communicated more, especially through "talk", compared to those operating alone in the game, as well as most probably also working together more as a group. The finding that choice of communication tool and communication pattern follows suit with location supports our interpretation of co-location as indicative of a collective work strategy.

Location, choice of words ("I" vs "we") and culture (I/C)

We also wanted to see if the choice of pronouns, "I" versus "we", would be related to location. As expected, the groups that worked more collectively (measured by degree of co-location), also employed the pronoun "we" significantly more than "I" (individual level: r=.304, p<.001; group level: r=.414, p=.002). The use of "we" in conjunction with co-location further supports the interpretation of co-location as collective work strategy.

We also wanted to see if the choice of words, "I" and "we", would be related to I/C. We found an almost significant but rather weak correlation at the individual level of analysis (r=.121, p=.077) and a non-significant weak correlation at the group level of analysis (r=.149,p=.274) between the relative use of the pronoun "we" as opposed to "I" and Individualism. Although not significant, the tendency is for more individualist cultures to use the pronoun "we" more often than "I". This was contrary to our expectations.

Degree of helpfulness and culture (I/C)

In order to decide the degree to which the group members tended to be helpful towards each other, we performed a qualitative analysis and categorization of the content of the chat-log. Based

on the definition and understanding of the I/C dimension, it was expected that helpfulness would correlate negatively with individualism and positively with collectivism. We found the opposite: individualism was significantly positively correlated with helpfulness at both individual and group levels of analysis (respectively: r=.298, p<.001; r=.354, p=.008). Degree of helpfulness was positively, but not significantly related to co-location.

Cooperative climate and culture (I/C)

We also performed a qualitative categorization of the content of the chat-log, in terms of communicational climate within the teams. Similar to helpfulness, we suspected that a good cooperative climate would be related to collectivism, if at all. It turned out that also this variable was rather positively related to individualism (individual level: r=.197, p=.003; group level: r=.228, p=.091). Cooperative climate had a weak positive, non-significant correlation with co-location.

Work strategy and culture I/C

The above variables related to location and seen as indications of work strategy (collective/individual) were expected to correlate with the I/C dimension. The correlation matrix below sums up the correlations with I/C at the individual and group levels of analysis (table 4.5). The results presented show that there, contrary to expectations, were *positive* correlations between the different direct measures of collective strategies and Individualism.

Table 4.5 Correlations at the individual and group levels of analysis: individualism and measures of collective strategy.

	Individualism	
	Group level of analysis N=56	Individual level of analysis N=224
Co-location	,259	,244(**)
Sig. (2-tailed)	,054	,000
Percentage of the word "we" compared to the word "I"	,149	,121
Sig. (2-tailed)	,274	,077
Total number of unique talk utterances initiated	,312(*)	,257(**)
Sig. (2-tailed)	,019	,000
Degree of helpfulness between team members	,354(**)	,298(**)
Sig. (2-tailed)	,008	,000
Communication tone/climate (positive)	,228	,197(**)
Sig. (2-tailed)	,091	,003
Collective reward strategy	,222	,212(**)
Sig. (2-tailed)	,101	,002

* Correlation is significant at the 0.05 level (2-tailed).
** Correlation is significant at the 0.01 level (2-tailed).
Pearson correlation.

4.7 Planning and culture (Ua)

It was expected that Ua would affect to what degree the teams and individuals planned how they would cooperate in the game session (planning) as well as whether they would follow through with the strategy they had planned (adherence to plans). We had a direct measure of planning. The plans that the teams made were recorded and these qualitative data were in turn coded and quantified for further analysis. Adherence to plans was the discrepancy between a team's plans and their actual behavior in the game. When checking for correlations, there were only found a weak but significant relationship between Ua and Adherence to plans (none to Planning) at the individual level of analysis (r=-.159, p=.017).

Two subjects clearly gave outlier values, being of a different nationality than the national groups they partook in[24]. These two were therefore excluded in the subsequent analyses. Controlling for Pd as well as for the possible interaction between Pd and Ua in a regression analysis, had no significant effect on Adherence to plans. A model of the relationship found between Ua and adherence to plans (omitting the outliers) is portrayed in Figure 4.17. The model explains 4% of the variance in the dependent variable (Adherence to plans). It shows that low Ua gives more adherence to plans than high Ua.

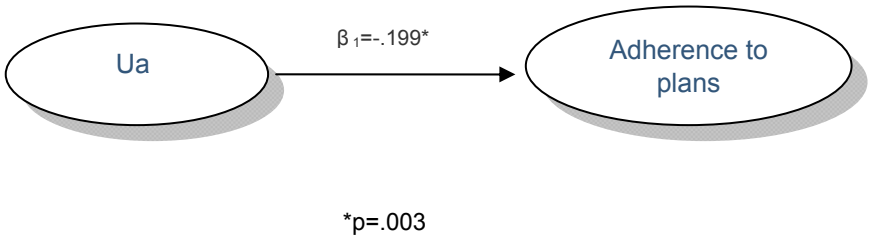
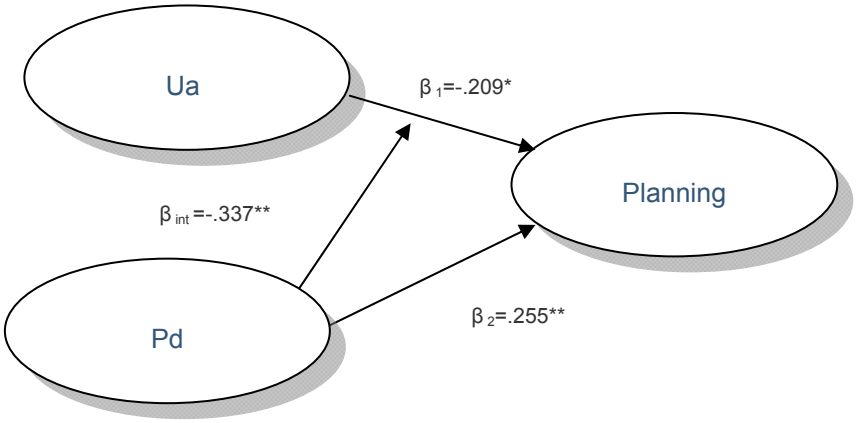


Figure 4.17 Model: predicting the effects of Ua on Adherence to plans.

When more thoroughly checking for a relationship between Ua and Planning, controlling for Pd as well as for the interaction between Pd and Ua in a regression analysis, centering the variables in order to avoid the problem of colinearity, it was shown that both Ua and Pd had significant effect on planning (β_{Ua}=-.209, p=.006; β_{Pd}=.255, p<.001; interaction β_{int}=-.337, p<.001). The model explains 11% of the variance in planning. The R^2 change when including the interaction term in the model was significant at the .001 level. This model is portrayed in Figure 4.18 Computing for national/homogenous groups only, we found the same relations, but stronger (R^2=.152; β_{Ua}=-.291, p<.001; β_{Pd}=.279, p<.001; interaction β_{int}=-.429, p<.001).

[24] These two subjects were both originally from Rumania; one partook in a Bulgarian group and the other partook in a US group.

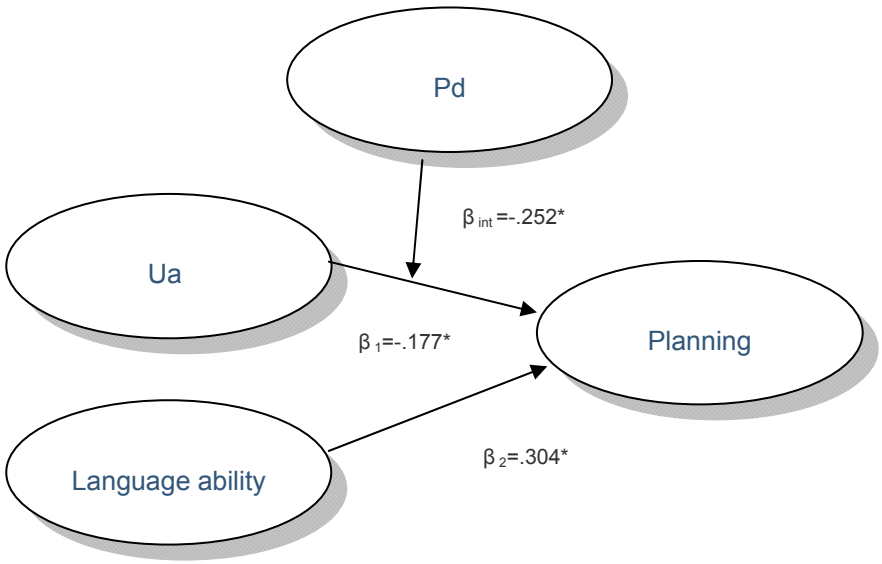


*p=.01, ** p<.001

Figure 4.18 Model: predicting the effects of Ua and Pd on planning.

The model shows that high Ua contributes to a lower degree of planning, while high Pd contributes to a higher degree of planning. However, the negative sign of the interaction term between Ua and Pd actually means that the (negative) effect of high Ua on planning is stronger when Pd is high. In other words, the combination of high Ua and high Pd gives the lowest degree of planning. The combination of low Ua and low Pd produces the most planning.

As planning was measured through written plans, it made us suspect language ability may have confused the results. Including language ability gave the following model (R^2=.175, p=.009)[25]: Figure 4.19.



*p<.05

Figure 4.19 Model: predicting the effects of Ua, Pd and language ability on planning.

[25] Based on national groups only, and the two outliers excluded.

Figure 4.19 shows that controlling for the effects of language ability eliminated the direct effect of Pd. This means that we have the highest degree of planning when Language ability is high, and both Ua and Pd are low, and the lowest degree of planning when Language ability is low, and both Ua and Pd are high.

5 Discussion

5.1 Language

Language ability level was measured through four questions showing very good reliability. It was found that language ability explained almost one third of the variance in the rating of language as an obstacle for information sharing at the group level. As we expected, this connection was stronger at the group than at the individual level. When cooperating in a group, the subjects did not only notice and report on the effect of their own ability level on information sharing, but also the level of the other persons in the group. A comparison of non-native English speakers (NNES) with native English speakers (NES) on the same variable, yielded the same results; NNES found language to be a much more important obstacle than did the NES.

5.2 Culture

It was shown that the VSM/Hofstede measurement of culture gave more variance between national cultures than the GCS/Matsumoto measurement, hence the VSM was found the most useful choice for the analyses and therefore employed in the following.

When comparing the participating nations' scores on the cultural dimensions, some of them were rather surprising compared to previous research on this. One of the reasons for the somewhat different scores is that the VSM-94 that we used is a revised version of the questionnaire Hofstede used in his IBM-study. However, as Hofstede indicates, even though the numbers may not be directly comparable, the relative relationship between the countries (i.e. rank order) on how they score should largely be maintained (Hofstede, 2001).

Some of the most interesting scores were found on the Individualism/Collectivism dimension; the current scores on this dimension as well as the rank order were quite different from what Hofstede found in his original IBM study. In general, the scores are all higher than Hofstede's original scores, and with the exception of Bulgaria, the rank order seems to have shifted between the countries. In the current study, Sweden and Norway scored the most individualistic, while the USA and the Netherlands scored the most collectivistic (i.e. when not counting Bulgaria). In the original study, on the other hand, the USA and the Netherlands scored the most individualistic, while Sweden and Norway scored the most collectivistic.

There could be many reasons for this. One possible explanation is the samples. Military officers may have chosen this occupation for different reasons in the various countries, given societal differences in opportunities, educational system, etc, and hence constitute a source of systematic differences in the selection. The same could of course be said for any matched samples across nations, also the IBM study; there are probably always some differences across countries as to why people have chosen the same job[26]. A study by Netland (2004) comparing women's reasons for joining the army in the US and Norway supports this explanation. In addition to pointing at societal differences in education and health care as possible motivators, it indicated that women in the Norwegian army may be more inclined to join in a search for challenge than women in the US army. If this is true also for our predominantly male sample, this could mean that one of the questions measuring the I/C dimension, regarding the importance of having an element of variety and adventure in the job, could make the Norwegians score relatively more individualist and the US score relatively more collectivist than found in previous studies. The data seem to support this explanation in some degree: Norway score over average while the US score under average on this question. Furthermore, a replication study by Soeters (1997), also with a military population, found the same rank order as we did. However, as he was using the original IBM-survey, the scores are generally lower.

Another possibility is that the national cultures simply have evolved in different directions since Hofstede's original study. Hofstede found the I/C dimension to correlate positively with a country's GNP (gross national product); i.e., individualism correlates with high GNP. Since the IBM study, there has been a relative increase in GNP in Norway compared to the other countries in the study, which could explain a shift in an individualist direction.

However, as individualism means being more individually rather than group oriented, we would have expected this to show in a question the subjects answered on how they would divide a reward within their group (from the Db1 questionnaire). As shown in the results section, this relationship was quite the opposite of what was expected; individualism was negatively correlated with the individualist strategy (dividing by merit) while positively correlated with the collectivist strategy (dividing equally). This finding supports the first explanation of sample differences, but also indicates that there may be a problem with at least one question on the I/C dimension when using the VSM on military samples. Indeed, several other results relating to work strategy (see chapters 4.6 & 5.6) show that Individualism (rather than Collectivism) is positively related to collective work strategies, hence, further supporting the interpretation that the current VSM-measurement of I/C has a problem when used on military samples.

[26] The USA is also a culturally heterogeneous country, where there may be different subgroups represented in the IBM as opposed to the military. Such subgroups have been shown to potentially have different cultural values (Triandis, 1994).

5.3 Trust

It was indicated in the results section that there were quite large and significantly higher levels of trust within the national than within the international teams. This supports the findings from Allied Warrior 2004 (AW04), reported in Bjørnstad (2006a), as well as previous research (Boyle & Bonacich, 1970; Gavrieli & Scott, 2005; Ibarra, 1993), indicating that it is harder to build trust in heterogeneous than in homogeneous groups. This was, however, the first time culture has been researched as the element of heterogeneity in relation to trust, hence adding new insight into the fields of cross-cultural group processes and trust.

The lesson from these studies is that one needs to invest more time and training together in order to build trust in international work groups, like NATO coalitions, as compared to national work groups, and the more culturally diversified at the outset, the more time will be needed. NNEC includes increased cooperation, also between countries, which indicates that this will be an important lesson to include in order to succeed with the implementation of NNEC.

It was expected that trust may be related to culture, especially to individualism/collectivism (I/C). Research indicate that the cultural dimension of I/C may affect people's tendency to trust people (Cox et al., 1991; Triandis, 1995). However, there was found no significant links between the I/C dimension of culture and trust; neither in the whole sample, nor for nationally and internationally composed groups when analyzed separately. There was also no relationship found between choice of reward strategy and trust.

The anticipated difference between subjects from high and low Power distance (Pd) cultures in relation to trust was also not found (based on Hofstede, 1991, 2001); subordinates from high Pd cultures did not demonstrate more trust in leaders than did subordinates from low Pd cultures and leaders from high Pd cultures did not demonstrate less trust in team-mates than did leaders from low Pd cultures. What we found, was that team-mates (non-leaders) from high Pd cultures, tended to trust their team-mates more than did those from low Pd cultures. This represents an interesting finding, but there is, however, no theoretical basis from which we would have expected this.

5.4 Communication

There was found great variation between the groups in terms of how much they communicated. This was also found to be linked to English language capability; the better in English, the more they communicated. Even though the relationship was not very strong, this underlines the importance of language proficiency in cooperative situations, and supports findings from AW04, reported in Bjørnstad (2005, 2006a).

It was expected and also found, that communication, operationalized as chat, would be related to culture. Individualism (I/C) was positively related to chat, indicating that subjects from

individualist cultures tended to communicate more. This was the opposite relationship of what we expected, further supporting the discussion in 5.2 & 5.6, questioning the usability of the I/C scale in military samples. Uncertainty avoidance (Ua) and Masculinity (M/F) were both negatively related to chat, indicating that subjects from cultures high in Ua and masculinity communicated less. This makes more sense; ambiguity or confusion in the game or in relations to other players could explain why high Ua would lead to persons becoming more reserved, while femininity has been linked to social values, negotiation and compromise (e.g., Hofstede, 2001).

5.5 Organization

There were found significant relationships between the subjects' perceptions of hierarchy, centralization, rating of the organization, and their Pd score. The finding that flat structure is related to flexibility supports the results from Battle Griffin 2005 (BG05, reported in Bjørnstad, 2006b), and the finding that decentralization is related to flexibility supports the results from both AW04 (reported in Bjørnstad, 2005, 2006a) and BG05. In other words, the current results indicated that there is a link between both flat structure and flexibility and decentralization and flexibility, which supports one of the most basic hypotheses onto which the ideas of NNEC has been built (e.g., Alberts & Hayes, 2003; NATO HQ SACT, 2004). Indeed, the data supports a model of flat structure and decentralization being predictors of an organization's flexibility. This was found both at the individual and at group levels of analysis. The connection between the variables was even stronger at the group level, lending further support to the interpretation at the organizational level.

Contrary to what was found in the AW04 and BG05 analyses, respondents seemed to have a more positive view of the team organization when they experienced it as more hierarchic and centralized. The question is why this is so. We know already from ample research on organization and problem-solving (e.g., Brown, 1988; Shaw, 1964) that simple tasks tend to make a centralized organization advantageous. Could this be the reason also in this case; that the experiment situation could be deemed a simple task situation? Certainly, a military operative organization is both more complex and deals with more complex issues than what a small controlled lab experiment can be. Nevertheless, qualitative data indicated that many subjects experienced the game as a complex environment, and possibly more so the subjects with less experience playing computer games. But as indicated in the results chapter, even though the correlations were somewhat stronger for the gamers, the same relationships were found for both gamers and non-gamers.

Technical solutions in the game, such as communication and information management tools, were found to influence the group processes, including restricting information-sharing and influencing the communication processes (who communicates with whom, etc). This finding underlines the importance of understanding the effect that collaborative technologies have on the collaborative

processes in an organization, and is important to keep in mind also when interpreting the other results.

As presented in the results chapter, in the game, long distance communication was restricted to sending messages to only one other player at the time, and represents a technological solution that did indeed influence the communicational pattern. This meant that it would take more time to communicate and share information with all in a decentralized manner than in a centralized manner if the team was dispersed. This could explain why the subjects seemed to prefer a hierarchic and centralized organization. It simply saved time and effort in the game. Qualitative data also indicated that playing may have been more time efficient, as well as less chaotic and confusing for the subjects, if the team organization was more hierarchic and centralized. Some comments also indicated that our subjects interpreted the game organization in light of what they were familiar with in their jobs in a military organization. In other words, if the organization was less hierarchic and centralized in the game than in the teams subjects were used to working in, they could interpret this as being the problem if there was confusion. What we know is that people work most efficiently in systems to which they are accustomed. (For a discussion on this topic, see Bjørnstad, 2005.)

The finding that subjects from high Pd cultures tended to rate the team organization more positively than those from low Pd cultures, could mean that the organization and/or game solutions for communication and information sharing were supporting more hierarchic and/or centralized organization and processes than what our respondents from low Pd cultures were accustomed to and/or preferred. This strengthens the above assumptions of the game having communication and information sharing solutions favoring centralized communication. Since organizations in low Pd cultures typically are flatter and more decentralized, subjects from these cultures may have been more frustrated having to work more centralized than those from high Pd cultures.

Indeed, it was also found that hierarchy tended to pay off in the game, in terms of more hierarchically structured teams tending to get higher game points per transaction than flatter structured teams. This could simply mean that this structure paid off in this game, and could hence be one of the reasons why this structure was more preferred among the players.

There were found no significant relationship between rating the team organization and Uncertainty avoidance (Ua). However, the tendency of the relationship was in the opposite direction of what we expected. Considering that there were reports of confusion and ambiguity in the game, which in theory people from low Ua cultures would handle better than people from high Ua cultures (Hofstede, 1991, 2001), we expected high Ua to be related to rating the team organization lower and not higher, as the data tended towards.

The Globesmart measures on the dimension Egalitarian/Status was also analyzed for any possible relationship to the organizational findings. There seems, however, to be a problem with the Globesmart measure in terms of low of variance. This makes us ask whether the Globesmart tool of cultural measurement may need some improvements before using it further in cross-cultural research.

It was expected that high Pd would increase the probability for micromanagement. More specifically, it was expected that high leader Pd would give more micromanagement, but that the subordinate would rate the micromanagement lower when the person was from a high Pd culture than when from a low Pd culture. Both the culture of the leader as well as the culture of the subordinate him/herself should affect how the subordinate describes the behavior of the leader; the former influencing the actual behavior of the leader, the latter influencing the subordinate's interpretation of that behavior. This was our expectations, but the results were very weak and far from significant. The reasons for this could be both low numbers in the international experiments (subordinates: N=24) as well as there possibly being a too small difference between the participating nations in Pd. This could be closely related to micromanagement as such; there is a possibility that this will primarily manifest itself in cultures with higher Pd than those present in our sample. Furthermore, the nature of the experiment could be such that it did not manage to manifest this behavior in our subjects, even if this behavior really is linked to Pd.

In sum, the organizational findings implicate the importance of having the organization fit both the task and the personnel (both in terms of their cultural make-up and what they are trained for), as well as the information management and collaborative systems being aligned to support the organizational structure and processes. This underlines the interconnectivity of technology and organization, at the core of the SINETT project, and the importance of thinking holistically in the development towards NNEC in both NATO and in the Norwegian Defense.

5.6 Work strategies

Relating to the choice of work strategies in the game, the location (co-location/individual) measure, was deemed the most important in our attempt to measure collective versus individual work strategies. It was found that co-location was related to lower performance scores as well as lower activity in terms of points' transactions. This was contrary to expectations based on group research on team work on disjunctive[27] tasks and performance (e.g., Hill, 1982; Shaw 1932). It seems that this tendency can be turned around in a game environment such as the NwN/SABRE used in our experiments. It implies that there are environments, at least simulated, in which team work is not optimal. Even though there was information that needed to be shared in the game in order to perform well, the game could simply be such that working alone played off. As shown in

[27] Disjunctive tasks are tasks where the contributions of team-members are not simply additive, but typically of a problem-solving type.

the result chapter on organization (4.5), the technological solutions for information-sharing and communication were less than optimal for dispersed team-work (i.e. one-to-one only). Hence, in order for team-work to yield better performance than individual work, the information and communicational systems must support team communicational processes.

The implication of this finding for the Norwegian Defense is a need to be keenly aware of this dependency in the development towards NNEC; if the organization is reorganized towards more team-work, the information and communicational systems must support team-work in order not to create an organization where less of the potential is taken out than in the current organization. These results stress the importance of technology and organization be developed in conjunction with each other.

It was furthermore found that the work strategy as measured by co-location was not only exerting an influence on performance, it was in itself influenced by culture (I/C). The cultural dimension of I/C seems to influence the choice of strategy, which in turn influences performance (game points). In other words, I/C was found to have an indirect effect on performance, through the choice of work strategy. However, the effect was in the opposite direction of what we expected based on previous research (e.g., Hofstede, 1991, 2002; Triandis 1995); individualism, rather than collectivism, was linked to choosing a collective work strategy.

As indicated above, location (co-location/individual), was the primary measure of collective as opposed to individual work strategies. The results chapter did, however, show that five other variables were related to the location variable; chat type "talk", the relative use of the pronoun "we" (as opposed to I), helpfulness and choice of reward strategy. It seemed that these variables could be understood as different aspects of work strategy, hence supporting the initial operationalization of work strategy as degree of co-location. In other words, being co-located in the game, employing the chat type "talk", using the pronoun "we" (as opposed to I), helpfulness towards other team-members and a collective choice of reward strategy all seem to indicate a collective rather than individual work strategy in the game.

As individualism has been closely tied to a preference for individual and more independent working arrangements (e.g., Hofstede, 1991, 2002; Triandis 1995), it was expected that the variables indicating a collective work strategy would be negatively related to individualism. The opposite was rather found: there were found positive relationships between the different measures of collective work strategy and Individualism. This strongly supports the discussion in chapter 5.2, of there possibly existing a problem when using the VSM as a tool of measurement of I/C in military samples. The fact that these were all but one observed or direct measures of behavior, and not just self-report measures, gives extra credibility to the current results.

5.7 Planning

Due to Ua having been linked to rule orientation and dislike for ambiguity (Hofstede, 1991, 2001), it was thought that Ua would affect planning positively in two ways. As compared to low Ua, high Ua was expected to give a tendency for more planning as well as increase the tendency to follow plans through (adherence to plans). This was not found. There was found a significant relationship between Ua and adherence to plans, but in the opposite direction of what was expected; low Ua had a weak link to adherence to plans. Since Hofstede (1991, 2001) indicated that a combination of high Pd and high Ua gave a culture with many rules but not necessarily a respect for the rules, a combination of low Pd and high Ua giving many rules *and* high respect of the rules, while a combination of low Pd and low Ua gave few rules but respect for the rules, we also wanted to control for Pd in relation to planning. Controlling for Pd as well as for the interaction effect of Pd and Ua, it did not give any significant changes in explained variance in relation to Adherence to plans. However, checking the same in relation to degree of planning, gave significant results; the model explained 11% of the variance in planning. It was shown that low Ua gave the highest degree of planning when also Pd was low, but still moderately high when Ua was low and Pd high. High Ua and Pd would mean the lowest degree of planning while high Ua and low Pd would mean a more moderately low degree of planning.

Adding Language ability to the model added significantly to the model's explanatory value; the model now explained 18% of the variance. Controlling for the effects of language ability also eliminated the direct effect of Pd but did not change the directions of the cultural interpretations. The model indicated that we have the highest degree of planning when Language ability is high, and both Ua and Pd are low, and the lowest degree of planning when Language ability is low, and both Ua and PD are high.

To sum up the relations between plans and culture: low Ua alone seems to give a propensity for following through with plans made, and the combination of low Ua and low Pd seemed to give the highest probability for making plans. The combination of high Ua and high Pd gave the least planning in our experiments. These results are not in line with the expectations based on Hofstede's findings on rule orientations and rule following presented above (Hofstede, 1991, 2001), indeed they seem to be in the opposite direction. The discrepancy could of course be due to plans not being sufficiently comparable to rules. Also, it could be related to the small number of cultures in our study (5), or it could be due to the effect of other confounding factors, for instance related to the nature of the computer game employed in our experiments or to games in general. There is also the possibility of a measurement problem, in terms of the VSM being less than suited for a military population. However, even though we found problems with the I/C dimension, there has been no other indications of such problems with the Ua and Pd dimensions.

6 Conclusion

This experimental study of cultural, organizational and team variables, has provided analyses of team processes in the experimental setting of a simulated mission. The analyses have supported as well as expanded on existing theories and research on some issues, but have on other issues also identified discrepancies that inspire future research.

The study was highly explorative in methodological terms. It showed how a computer game simulated mission successfully can be used to explore issues of cooperation in an international military context. It was the use of this game environment with distributed collaboration that made the cross-cultural experiments possible, but as the results here also indicate, there is a need to be aware of the limitations of such studies in terms of generalizations; certain processes risk being influenced by the research tool. What we saw in these experiments, employing a relatively simple game with limited communicational possibilities, is that both scenario and collaborative solutions can influence organizational processes. The current experiences should be an aid in the future creation of good simulated environments for research in both cross-cultural as well as other human factor research. New development in the field of serious gaming and virtual worlds also show good promise for the future of using games in human factor research. The closer the virtual world can be made the one we wish to study, the better it is. However, we should always be aware that experimental human factor research from any synthetic environment should be interpreted with care and preferably also be triangulated with context rich field research.

The study has given increased knowledge about organizational processes linked to cooperation and culture in a controlled environment, adding new insights to the former analyses from operational environments (AW04 and BG05), reported in Bjørnstad (2005, 2006a & b). The results clearly show both how culture and organizational structure and processes are interrelated as well as being influenced by the information and communicational technologies available. There is a need to be sensitive to these issues in order to create an increase in output rather than a decrease when introducing new technologies and organizational concepts in the development of both NATO and the Norwegian Defense towards NNEC.

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Abbreviations

SINETT – Collaboration in networks
LTAMC – Leader and team adaptability in multinational coalitions: Cultural diversity in cognition and teamwork
CD&E – Concept Development & Experimentation
HFM – Human Factors and Medicine
RTG – Research and Technology Group
NBD – Network Based Defense
NbF – Nettversbasert Forsvar
NNEC – NATO Network Enabled Capabilities
I/C – Individualism/Collectivism
Pd – Power distance
Ua – Uncertainty avoidance
M/F – Masculinity/Femininity
Lt/St – Long-term/Short-term Orientation
NwN – NeverWinter Nights
SABRE – Situation Authorable Behavior Research Environment
NEO-PI – NEO Personality Inventory
GCS – Globesmart Commander Survey
VSM – Values Survey Module
Db – Debriefing questionnaire
SA – Situation awareness
AW04 – Allied Warrior 2004
BG05 – Battle Griffin 2005
MMNE4 – Multi National Experiment 4

Appendix

A.1 Background Survey

The background questionnaire is a is a pre-game survey. Included below is a complete list of the questions and answer choices.

Age

Sex
Male
Female

What is your nationality?
Norwegian
Swedish
Canadian
American
Dutch
British
Other
If Other, please specify.

How many years have you lived in this country?

How many languages do you speak?

List the languages you speak.

What is the highest degree you have completed?
High School or equivalent
Associate Degree or 2 years after high school
Bachelor's Degree or equivalent
Master's Degree or equivalent
PhD or doctorate equivalent

What is your current military rank (NATO standard)?
OR
OF-1
OF-2
OF-3
OF-4
OF-5
OF-6
OF-7
OF-8
OF-9

Is English your native language
Yes
No

How would you rate your ability to read and write in English?
Very Poor
Poor
Functional
Fluent
Very Fluent

Even though you may have a very good command of the English language, how often do you:

feel that you get more easily stressed when working in an English-speaking environment rather than in your native language?
Not Applicable
Never
Seldom
Sometimes
Often
Very Often

become more reserved about presenting your point of view in English than in your native language?
Not Applicable
Never
Seldom
Sometimes
Often
Very Often

Computer and Game Experience

What is your overall level of computer expertise
Low : Seldom use computers
Medium : Use computers often and are comfortable with them
High : Use computers a lot and feel very comfortable about my abilities

Do you own a computer?
Yes
No

Have you ever used any of the following collaboration tools (check all that apply)
Email
Daily
Weekly
Monthly
Yearly
Don't use

Web Browsers
Daily
Weekly
Monthly
Yearly
Don't use

Video Teleconferencing
Daily
Weekly
Monthly
Yearly
Don't use

Instant Messaging/Chat
Daily
Weekly
Monthly
Yearly
Don't use

Netmeeting/WebEx
Daily
Weekly
Monthly
Yearly
Don't use

Do you own or use often any of the following game consoles (check all that apply)?
Playstation 1 or 2
Xbox
Gamecube
Personal Computer

Approximately how many hours per week, if any, do you spend playing computer games?

Approximately how many hours per week, if any, do you spend playing multi-player computer games?

Have you ever played the game Neverwinter Nights?
Yes
No

What computer games, if any, do you most often play?

Have you ever developed any mods for games?
Yes
No

If yes, please list the games:

A.2 ”Debriefing questionnaire 1” (general)

The debriefing questionnaire 1 is a post-game survey. Included below is a complete list of the questions and answer choices.

How familiar were you with your teammates before today?

Not at all 1
2
3
4
5
6
Very familiar 7

How important was it to you to know who was playing which character?

Not At All Important 1
2
3
4
5
6
Very Important 7

Did you find out who was playing:

a. Frank
Yes
No

b. Jacob
Yes
No

c. Nathaniel
Yes
No

d. William
Yes
No

Communication

In your opinion, to what extent did team members provide relevant information to another team member, in a pro-active way, without that team member having to ask for it?

Not At All 1
2
3
4
5
6
Always 7

In your opinion, to what extent were failures caused by inadequate communication among team members?

Not At All 1
2
3
4
5
6
To a large extent 7

Would you have preferred more or less information sharing from your teammates?

Much less 1
2
3
4
5
6
Much more 7

Monitoring

In your opinion, to what extent did team members alert each other to impending decisions and actions?

Not At All 1
2
3
4
5
6
To a large extent 7

Back-up Tasks

In your opinion, how much did team members help each other without being asked?
Not At All 1
2
3
4
5
6
To a large extent 7

In your opinion, did the team members adjust individual task responsibilities to prevent overload?
Not At All 1
2
3
4
5
6
To a large extent 7

Coordination Tasks

In your opinion, to what extent was the team's behavior coordinated?
Not At All 1
2
3
4
5
6
To a large extent 7

Team Orientation

In your opinion, how similar were the leader's and the other team members' understanding of the mission?
Not At All 1
2
3
4
5
6
In complete agreement 7

What was the goal of the mission?

Situation Awareness

How good would you rate your overall situation awareness during the mission?

Very Poor 1
2
3
4
5
6
Very Good 7

Leadership

Was there a leader in today's session?

Yes
No

If so, who was the leader?

Frank
Jacob
Nathaniel
William
No one was the leader

How effective was the leader?

Not at all 1
2
3
4
5
6
Very Effective 7

Did the leader change over time?

Yes
No

If so, please describe:

How important is a leader for this task?

Not At All Important 1
2
3
4
5
6
Very Important 7

Performance

Prior to entering the equipment room, did your team arrive at a clear plan for distributing the equipment?

Not At All 1
2
3
4
5
6
To a large extent 7

How effective was your plan for distributing the equipment?

Not At All 1
2
3
4
5
6
To a large extent 7

Prior to starting the mission, did your team have a clear plan for finding the weapons caches?

Not At All 1
2
3
4
5
6
To a large extent7

How effective was your plan for finding weapons caches?

Not At All 1
2
3
4
5
6
To a large extent 7

What was your personal search strategy during the task?

Was your search strategy different from the team's strategy?

Yes
No

If so, how?

How important were the subquests during the mission?
Not At All Important 1
2
3
4
5
6
Very Important 7

How much were you aware of Frank's activities?
Not At All 1
2
3
4
5
6
To a large extent 7

How much did Frank contribute to the team?
Not At All 1
2
3
4
5
6
To a large extent 7

How much were you aware of Jacob's activities?
Not At All 1
2
3
4
5
6
To a large extent 7

How much did Jacob contribute to the team?
Not At All 1
2
3
4
5
6
To a large extent 7

How much were you aware of Nathaniel's activities?
Not At All 1
2
3
4
5
6
To a large extent 7

How much did Nathaniel contribute to the team?
Not At All 1
2
3
4
5
6
To a large extent 7

How much were you aware of William's activities?
Not At All 1
2
3
4
5
6
To a large extent 7

How much did William contribute to the team?
Not At All 1
2
3
4
5
6
To a large extent 7

What was your team's final goodwill score?

What percentage of the score did you contribute?

**If you were asked to divide up a mission reward the team was given between
 the team members, how would you prefer to divide it?**
Divide Equally
Divide By Merit

If your team was rewarded with 1,000 dollars and you had to divide it by merit, how much would you give each team player?
Frank
Jacob
Nathaniel
William

How would you grade your team's performance?
Very Poor 1
2
3
4
5
6
Very Good 7

What, if anything, do you think your team should have done differently during the task?

Familiarization

How suitable was the familiarization session in preparing you for your task?
Very Poor 1
2
3
4
5
6
Very Good 7

What was the best part about the familiarization session?

What part of the game were you least prepared for after the familiarization session?

Miscellaneous

Was this game fun?
Not at all 1
2
3
4
5
6 Very Much 7

A.3 ”Debriefing questionnaire 2” (organization)

The second debriefing questionnaire was a post-game survey. Included below is a complete list of the questions and answer choices.

ORGANIZATION AND TEAM PROCESSES

How would you rate the amount of work that you had to do in your role in this game?
Too much
Somewhat too much
About right
Somewhat too little
Too little

How included were you in the team processes (decision-making, information handling, etc)?
Very included
A bit included
Not at all included

How would you rate the team organization in general?
Very good
Somewhat good
Neutral
Somewhat poor
Very poor

How would you describe the hierarchy in this team?
Very flat/egalitarian
Somewhat flat/egalitarian
Neutral
Somewhat hierarchic/vertical
Very hierarchic/vertical

How would you describe the team processes in terms of centralization/decentralization?
Very decentralized
Somewhat decentralized
Neutral
Somewhat centralized
Very centralized

How would you describe the flexibility of the team (e.g. between centralized and decentralized processes)?
Very flexible
Somewhat flexible
Neutral
Somewhat rigid
Very rigid

Did restrictions in the game's information-management, communication tools, etc, influence the team processes (how the team cooperated)?
Yes, very much
Yes, somewhat
No, no influence

If yes, how?
Made leader much more central
Made leader somewhat more central
Made leader somewhat less central
Made leader much less central
If other, please describe.

Was the team leader leading (i.e. making decisions, giving directions, etc) too much or too little compared to what you would prefer?
Too much
Somewhat too much
About right
Somewhat too little
Too little

How confident were you that the leader would assist you if you needed help?
Not applicable, I was the leader
Very confident
Somewhat confident
Neutral
Somewhat doubtful
Very doubtful

How confident were you that team members would assist you if you needed help?
Very confident
Somewhat confident
Neutral
Somewhat doubtful
Very doubtful

How confident were you that the leader would fulfill his responsibilities?
Very confident
Somewhat confident
Neutral
Somewhat doubtful
Very doubtful

How confident were you that team members would fulfill their responsibilities?
Very confident
Somewhat confident
Neutral
Somewhat doubtful
Very doubtful

DECISION-MAKING

Did you experience that the team leader made decisions that were within other team members' area of responsibility?
Very often
Often
Sometimes
Rarely
Never

Did you experience that the team leader increased supervision (e.g. to make sure things were done properly)?
Very often
Often
Sometimes
Rarely
Never

Who made most decisions in your team?
Frank
Jacob
Nathaniel
William
No difference

In your opinion, how was the speed of decision making in the team?
Too slow
Somewhat slow
Just right
Somewhat fast
Too fast

How would you rate the quality of decisions made by the team.
Very good
Good
Neutral
Poor
Very poor

How successful was the outcome of decisions made by the team?
Very successful
Somewhat successful
Neutral
Somewhat unsuccessful
Very unsuccessful

INFORMATION-SHARING

Did you receive too much or too little information in order to make decisions in this game?
Too much
Somewhat more than need
Appropriate amount
Somewhat less than need
Too little

How satisfied were you with the information you received from the other players (in terms of making you more able to make decisions and complete your tasks)?
Very satisfied
Somewhat satisfied
Neutral
Somewhat unsatisfied
Very unsatisfied

How confident were you that the leader would share important information with you?
Not applicable, I was the leader
Very confident
Somewhat confident
Neutral
Somewhat doubtful
Very doubtful

How confident were you that your team members would share important information with you?
Very confident
Somewhat confident
Neutral
Somewhat doubtful
Very doubtful

In your opinion, what were the greatest obstacles (hindrances) for you to share information with the team? Please rate each from 1 to 5, 1 = lowest (no hinder), 5 = highest (great hinder). Mark only one box for each obstacle.

Technical difficulties/game interface:
1 (lowest)
2
3
4
5 (highest)

Language barriers:
1 (lowest)
2
3
4
5 (highest)

Time constraints:
1 (lowest)
2
3
4
5 (highest)

Lack of knowledge about who needed information:
1 (lowest)
2
3
4
5 (highest)

Did the information distribution and management tools influence whom you communicated with on the team?
Yes, very much
Yes, somewhat
No, no influence

With whom did you communicate the most?
Frank
Jacob
Nathaniel
William
No difference

With whom did you share information the most?
Frank
Jacob
Nathaniel
William
No difference

From whom did you most frequently request information?
Frank
Jacob
Nathaniel
William
No difference

Who requested information most frequently from you?
Frank
Jacob
Nathaniel
William
No difference

LANGUAGE

Did you experience that it was harder to persuade your team mates using English than your native language?
Never
Seldom
Sometimes
Often
Very often

Did you experience that it took longer time to read English than your native language?
Never
Seldom
Sometimes
Often
Very often

Did you experience your team-mates having problems using English?
Never
Seldom
Sometimes
Often
Very often

A.4 Values Survey Module 1994 (VSM – 94)

The Hofstede Values Survey is a pre-game survey. Unlike the other questionnaires, this survey is not validated for scoring individuals, and should only be used to score the national cultural factors of groups of people. It is a pre-game survey. Included below is a complete list of the questions and answer choices (www.geerthofstede.com; as indicated at Hofstede's website, permission is given by the author to be freely use the VSM-94 survey for research purposes).

Please think of an ideal job, disregarding your present job, if you have one. In choosing an ideal job, how important would it be to you to ...

have sufficient time for your personal or family life
Of Utmost Importance
Very Important
Of Moderate Importance
Of Little Importance
Of Very Little or No Importance

have good physical working conditions (good ventilation and lighting, adequate work space, etc.)
Of Utmost Importance
Very Important
Of Moderate Importance
Of Little Importance
Of Very Little or No Importance

have a good working relationship with your direct supervisor
Of Utmost Importance
Very Important
Of Moderate Importance
Of Little Importance
Of Very Little or No Importance

have security of employment
Of Utmost Importance
Very Important
Of Moderate Importance
Of Little Importance
Of Very Little or No Importance

work with people who cooperate well with one another
Of Utmost Importance
Very Important
Of Moderate Importance
Of Little Importance
Of Very Little or No Importance

be consulted by your direct superior in his/her decisions
Of Utmost Importance
Very Important
Of Moderate Importance
Of Little Importance
Of Very Little or No Importance

have an opportunity for advancement to higher level jobs
Of Utmost Importance
Very Important
Of Moderate Importance
Of Little Importance
Of Very Little or No Importance

have an element of variety and adventure in the job
Of Utmost Importance
Very Important
Of Moderate Importance
Of Little Importance
Of Very Little or No Importance

In your private life, how important is each of the following to you?
Personal Steadiness and stability
Of Utmost Importance
Very Important
Of Moderate Importance
Of Little Importance
Of Very Little or No Importance

Thrift
Of Utmost Importance
Very Important
Of Moderate Importance
Of Little Importance
Of Very Little or No Importance

Persistence (perseverance)
Of Utmost Importance
Very Important
Of Moderate Importance
Of Little Importance
Of Very Little or No Importance

Respect for tradition
Of Utmost Importance
Very Important
Of Moderate Importance
Of Little Importance
Of Very Little or No Importance

How often do you feel nervous or tense at work?
never
seldom
sometimes
usually
always

How frequently, in your experience, are subordinates afraid to express disagreement with their superiors?
very seldom
seldom
sometimes
frequently
very frequently

To what extent do you agree or disagree with each of the following statements?:
Most people can be trusted
Strongly Agree
Agree
Undecided
Disagree
Strongly Disagree

One can be a good manager without having precise answers to most questions that subordinates may raise about their work
Strongly Agree
Agree
Undecided
Disagree
Strongly Disagree

An organization structure in which certain subordinates have two bosses should be avoided at all costs
Strongly Agree
Agree
Undecided
Disagree
Strongly Disagree

Competition between employees usually does more harm than good
Strongly Agree
Agree
Undecided
Disagree
Strongly Disagree

A company's or organization's rules should not be broken - not even when the employee thinks it is in the company's best interest
Strongly Agree
Agree
Undecided
Disagree
Strongly Disagree

When people have failed in life it is often their own fault
Strongly Agree
Agree
Undecided
Disagree
Strongly Disagree

A.5 Globesmart Commander Survey (GCS)

The GlobeSmart Commander questionnaire is a pre-game survey. Included below is a complete list of the questions and answer choices. (Permission was obtained by the authors, Matsumoto/MeridianGlobal, to use the GCS in our research, and permission should be secured before any future use.)

Forever Faithful describes my attitude towards my unit whether I am a Marine or not.

Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

There is no bond as strong as those formed when belonging to elite organizations like Rangers, SF, SEALS, etc.

Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

If a mission succeeds because of my efforts, I try and share the credit with everyone in my unit.

Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

It is important for the military to constantly transform and acquire new ways of thinking.

Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

I often find the routine of military life a little boring and wish for some excitement.
Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
AgreeStrongly Agree
Not Applicable

It is fine for me to question my orders if I think they could be improved.
Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

As a leader, I should be able to give advice to subordinates about their personal lives even if they do not ask for it.
Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

It is appropriate for me to raise my voice if the behavior of a subordinate angers me.
Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

I should be able to sit back and relax when interacting with my superiors.
Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

When I am speaking with a subordinate, it is natural that I should control the conversation.
Strongly Disagree
Disagree
Somewhat Disagree Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

Regulations restricting socializing between officers and enlisted personnel should be relaxed.
Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

When conversing with a superior officer I use more formal language than when talking with my peers.
Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

I like having the responsibility for the success of a mission depend entirely on me.
Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

It is important to know how my performance compares to others of similar rank.
Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

I enjoy taking on new challenges whether I am certain I can handle them or not. Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

I am good at making quick decisions in ambiguous situations.
Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

If my assignment was made more demanding I am sure I could handle it.
Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

I am uncomfortable adapting the plan during a mission.
Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

I cannot stay angry with another officer once I know what motivated him or her to act in a particular way.
Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

It is very important to me that my fellow officers recognize my abilities and achievements.
Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

I prefer to lead rather than to follow.
Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

I don't like small talk during briefings.
Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

Getting along with members of my unit is more important to me than career advancement.
Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

The officer or NCO in charge of any group should make sure that all the unit members are socially acquainted.
Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

When my superior gives an order I do not understand, I usually ask a peer what I should do rather than asking the officer.
Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

When someone says something, I try to figure out what they really mean.
Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

How someone says something is often more important than what they say.
Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

I speak my mind even if I disagree with my superiors.
Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

When I disagree with someone, I think it is better to talk about it with a third person in order to avoid an open conflict.
Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

I am good at saving money.
Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

The future is too uncertain to make long term plans.
Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable

The present is all I think about, and the future can take care of itself.
Strongly Disagree
Disagree
Somewhat Disagree
Neither Agree Nor Disagree
Somewhat Agree
Agree
Strongly Agree
Not Applicable