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“The Evolution of C2”

## Transmission and Reception of Commander’s Intent in a Hierarchical Chain of Command

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### Primary Topic 7 - C2 Approaches and Organization

A study of Commander’s Intent (CI) in a Command and Control (C2) exercise was performed. The study focused on the performance of a brigade battle group. The highest commander and the battle commander, respectively, considered having transmitted CI to the subordinate commander in a distinct and clear manner. The brigade command considered having transmitted CI somewhat less clearly to their subordinate commanders. Both the brigade and battle commanders considered having transmitted CI somewhat more clearly to their subordinate commanders than they considered having received CI from their superior command. This is crucial since commanders at a subordinate level are supposed to act in accordance with mission-type tactics. If CI is not fully understood, or even altered, the risk for misinterpretation of CI at even lower levels is substantial. This study revealed a discrepancy between highest command and subordinate commanders in the formulation of CI during the scenario, where CI changes from an overall understanding of what need to be accomplished to be more focused on the actual situations. This could be problematic since the understanding for goals like initiation of piece agreements might get lost when CI is expressed more like solving the ongoing problems or conflicts.

## BACKGROUND

The concept of Command and Control (C2) builds on two leading principles: good overall understanding and great flexibility. Having a good overall understanding is a precondition for different levels of command, particularly for making it possible for commanders to take own initiatives. In order to achieve a good understanding, well-performed integrated command and early communication are necessary. The foundation for mission-type tactics is a high level of understanding, where the advantages of Network Centric Warfare are brought into play (Försvarsmakten, 2008). Mission-type tactics include commanders who see an opportunity when it occurs and then act fast in high tempo and thereby take responsibility and use the resources as best suited in the situation, even though the orders does not say exactly how to solve a situation.

C2 is often distributed and the commanders have to provide plans and issue their overall view to subordinate commanders. The information distributed is often formulated as an intent, which gives the receivers the possibility to act within certain boundaries given their local perspectives of the environment. If the highest command establishes too much control, it can inhibit the local commanders' initiatives and possibilities to act. On the other hand, if there is no guidance the coordination between several local commanders/units may be more difficult and suboptimal, if not even counterproductive. Shattuck and Woods (2000) investigated communication of intent in military C2 systems and in a simulation they showed that company commanders only matched battalion commanders in thirty-four percent of the thirty-two episodes investigated. This may indicate a need for improvement if commanders at a subordinate level are supposed to act in accordance with mission-type tactics.

Within the Swedish armed forces, commander's intent (CI) shall be described as concise and clear as possible, so the overall purpose of the operation is evident. The purpose shall be formulated by the commander. Even if it is brief, it shall reflect the personality of the commander and his/her leadership style. Furthermore, the purpose shall contain both motivation and guidance. In addition, objectives and desired end-state shall be evident. The purpose is the binding agent between the tasks from the superior commander to his/her subordinate commanders. This is vital for the cooperation between different levels of command and for the possibilities to pursue operations with mission-type tactics (Försvarsmakten, 2008).

The Swedish Armed Forces define CI as:

*“The commander's intent (CI) is the foundation for subordinate commanders' possibilities to take initiatives when unexpected possibilities occur. CI shall be expressed briefly and is mandatory for all orders.”* [from Försvarsmakten, 2008, p.66]

US Army defines CI in a similar but somewhat different way:

*“The commander’s intent is a clear, concise statement of what the force must do and the conditions the force must meet to succeed with respect to the enemy, terrain, and the desired end state.”*

[from Headquarters Department of Army, 1997, 5-14]

Thus, CI is coupled to the mission and shall be used to orient subordinates’ efforts when significant and potentially decisive opportunities appear. It includes tempo and duration, and effects on enemies, friends, and terrain considered crucial for the mission (Headquarters Department of Army, 1997).

Research has shown that subordinates are more likely to share and adapt to CI when it expresses the values by which the action should be selected, and they are less adaptable to unexpected changes when the mission is stated concretely with specific tasks (Winner, Freeman, Cooke, & Goodwin, 2007). Research also supports the finding that statement composition can affect the interpretation of CI (Lindoff, Andersson, Wikberg, Marklund, & Ohlsson, 2006).

## **METHODS**

We investigated different aspects of transmitted and received CI in the chain of command of a C2 exercise performed over several days. The focus of the exercise was on the training and performance of a brigade battle group. Data were collected during the ongoing exercise with regular military activities. It was only possible to use self reports through questionnaires and there was only limited time to discuss CI with the participants. In this field study it was not possible to use expert observers or logging of computers/network because of limited physical space, lack of observers, and security issues. Thus, the possibilities to collect data were somewhat limited. In a simulated setting, this could have been performed differently. However, the choice of a real military setting provides the benefits of field research, for example, high external validity by subjects in their natural environment.

### **Participants**

In all, approximately one-hundred officers participated in a C2 training exercise. Of these, 11 participated in the study of CI: one in the highest command (HC), one in the brigade command (BrC), six in the battle command (BaC), and three in the battalion command (BtC). The staff in this exercise is trained to command 6000 soldiers, and to be part of the European Union group of 60000 soldiers. The battalion is about 800 soldiers.

### **Materials**

The study was performed in the Swedish Armed Forces Joint Development Center in Enköping. They work with command and control, information processes and resulting effects. Development of next generation of C2 concepts are also made that includes testing during different exercises.

Each of the four levels that were studied, highest-, brigade-, battle-, and battalion command was housed in separate staff rooms (an example is shown in Figure 1). They communicated with each other by phone, mail, computer network area, and various C2 systems (including the new system called Stridsledningssystem Bataljon (SLB)).



**Figure 1.** G3 Battle Command with brigade commander visiting to discuss tactics.

Four versions of a CI questionnaire were used, one version adapted for each type of investigated level of command. The questionnaires asked for the following aspects of CI:

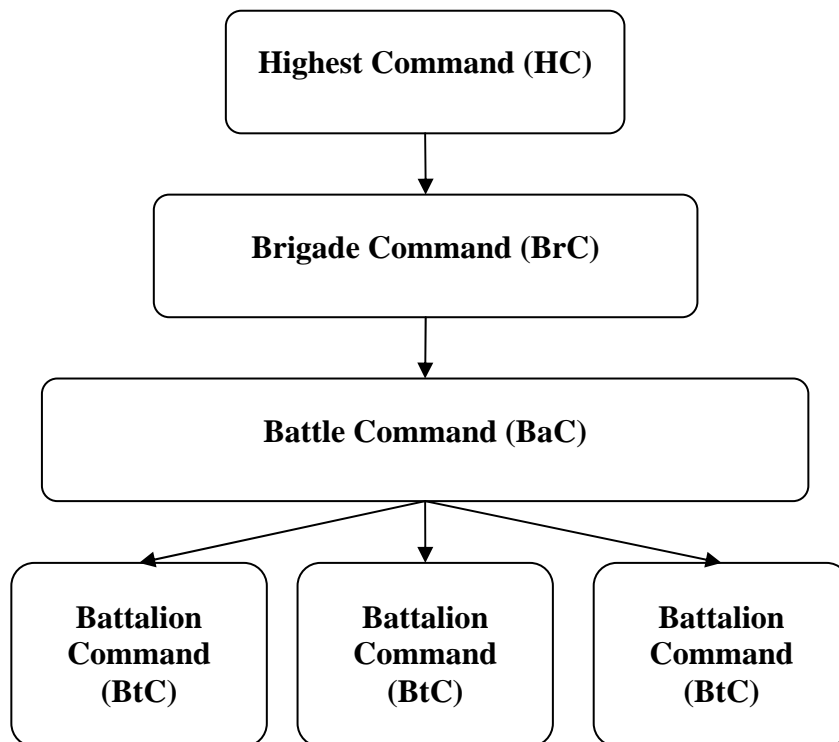
- the most important content of CI during the scenario
- transmission and reception of CI
- changes in CI after feedback from subordinates

The questionnaire consisted of 7-points rating scales, and open questions. In the open questions, the participants could define the most important content of CI in the scenario, justify their different viewpoints and provide other comments. Because of time limitations, CI was only one of several activities performed during the exercise. Thus, the number of open questions was limited.

### **Procedure and design**

The task for the brigade battle group was to conduct a defensive operation with the purpose of enforcing a peace plan. In consultation with the exercise command, the information flow of the hierarchical command as depicted in Figure 2 was chosen for the present study. The focus of the study was to determine what the participants considered to be the most important parts of CI during the scenario and the clearness of transmission and reception of CI in this

hierarchical chain of command. A comparison was made between how clear the brigade and battle command considered having transmitted CI and how clear their subordinate commanders considered having received CI.



**Figure 2.** Levels of command with highest, brigade, battle and battalion command in the C2 exercise.

We also investigated if CI was changed as a result of discussion with subordinate commanders, and to which degree the superior command level considered that their subordinates had followed CI. These are important issues, since both the battle command and battalion commanders execute orders from the highest command, and in a highly dynamic context, they primarily have to act in accordance with CI and not exclusively on direct orders.

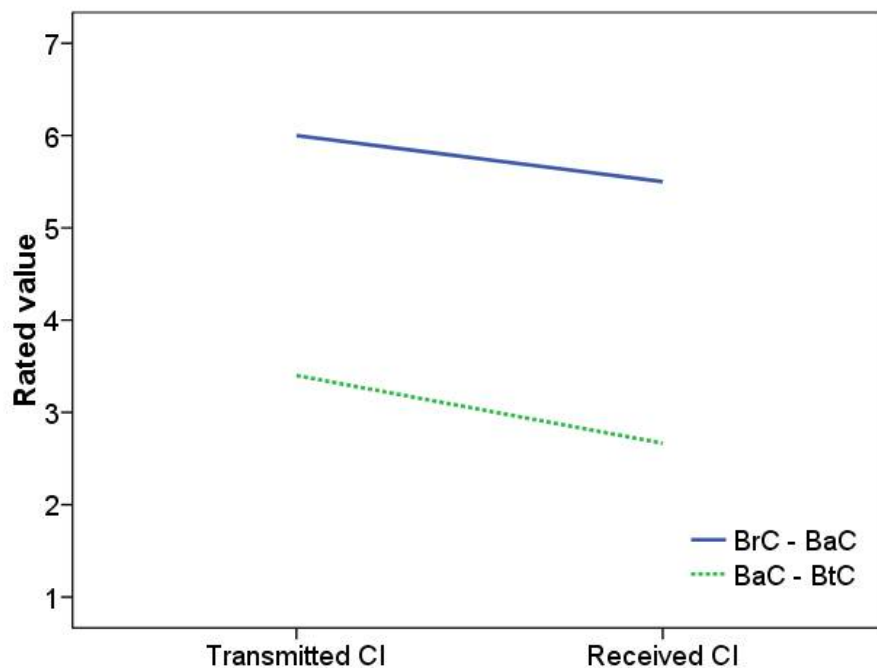
Since the study was performed during a real C2 exercise, it was by necessity performed according to a quasi-experimental design paradigm (see e.g., Cook & Campbell, 1979). Furthermore, since the number of studied commanders was small, the assumptions of inferential statistics were not met. Thus, only trends and qualitative data are reported.

## **RESULTS**

The answers to the open questions show that the HC decided that CI in the scenario was to create a safe and secure environment, implement peace agreements, neutralize irregular troops, implement a control zone-of-separation, and to provide the local authorities the possibility to act. The BrC

(hierarchically one level below HC) then altered CI to handle problems in different areas, prepare for a possible hostile attack, and finalize the operation. This is different from the CI formulated by HC, in a more abstract overall manner. The BaC view of CI correlates well with the BrC view, and somewhat less with the HC more overall and abstract view. At the lowest level in the chain explored, the CI of the BtC is on a pragmatic operational level and explained with less detail than on superior levels (BrC and BaC). One battalion commander also expressed some concern about the overall goals of the operation, which was not the case at any other level.

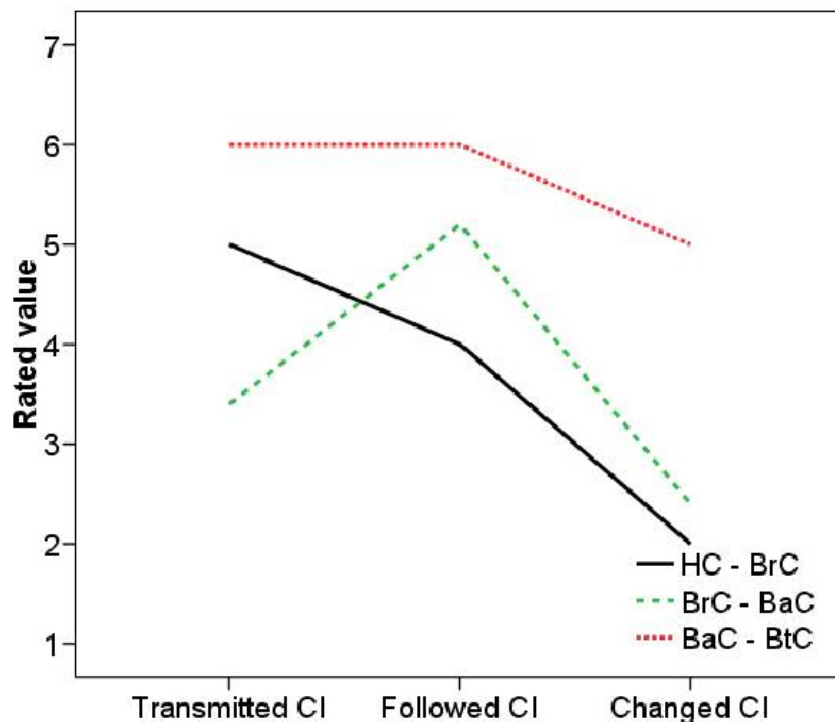
There were markedly higher ratings of clearness of both transmission and reception of CI between the Brigade and Battle commanders than between the Battle and battalion commanders. Overall, there is a slight tendency that the superior commanders considered having transmitted CI somewhat clearer than what the subordinate commanders considered having received CI (BrC-BaC: 6.0 – 5.5; BaC-BtC: 3.4 – 2.7) (Figure 3).



**Figure 3.** Ratings of how clear the superior commanders considered have transmitted CI and how clear their subordinate commanders considered have received CI.

HC rated his transmission of CI to his subordinate commander BrC as relatively distinct and clear, but considered that BrC only had followed CI at an intermediate level. BrC rated his transmission of CI to his subordinate commanders BaC as low, but still considered that BaC had followed CI relatively well. BaC rated their transmissions of CI to their subordinate commanders (BtC) as distinct and clear, and they also had the view that BtC had followed CI relatively well. Neither HC nor BrC changed CI as a result of discussions with their subordinate commanders. However, BaC changed CI as a

result of feedback from BtC. The reason, and thereby the full understanding, for this change of CI is somewhat unclear. Moreover, there were no indications that BaC communicated this change to BrC and HC. Thus, these results show that CI was changed at the lower command levels, and that the transmission and reception of CI between the levels of command were not communicated as expected. In this context it is interesting that BaC changed CI because of the communication with their subordinate commanders, BtC, but still considered that BtC had followed CI well. Obviously, this change of CI must have been communicated. It may be a problem that BrC rated his transmission of CI to BaC as less clear and distinct, but still considered that BaC had followed CI relatively well.



**Figure 4.** Ratings of superior commanders: clearness in their own transmission of CI to their subordinate commanders; how well their subordinate commanders had followed CI; and if they had changed CI because of feedback from their subordinate commander;

## DISCUSSION

The study shows that the lower part of the chain of command (battle command – battalion command) had markedly lower ratings of clearness of both transmission and reception of CI. Furthermore, CI was changed at the BaC level. This is crucial since commanders at a subordinate level are supposed to act in accordance with mission-type tactics (Försvarmakten, 2005). If CI is not fully understood, or potentially even worse altered at the battalion level, the risk increases for misinterpretation of CI at the lower levels, e.g. by a company commander in the field. Potential consequences can be that commanders' act according to what they (erroneously) believe is the intent of the HC, which might lead to unwanted results. Another risk is that commanders may only act

on direct orders, with consequences of slower decision making and lost “windows of opportunities” regarding important tactical actions.

The ratings of the clearness of the commanders’ own transmission of CI to their subordinate commanders were somewhat higher than the ratings of clearness of received CI from their superior commanders. This discrepancy, even if small, indicates that there is a risk that superior commanders believe that their subordinate commanders understand more of the overall intent of the operation than they actually do.

The HC only rated the BrCs following of CI at an intermediate level. This may indicate a problematic break in the distribution of CI of the hierarchical chain of command. It is especially problematic, that this indication of a break occurred already in the top of the chain. Furthermore, BaC changed CI as a result of their discussions with subordinate commanders, and did not communicate this to the BrC. In a real situation this could have severe consequences. For example, that commanders at lower levels, e.g. company commanders, take initiatives in what they think is the CI of the HC. In this study, it is interesting that there was a change in focus of CI from the highest command to the lower levels. CI changed from an overall understanding of what need to be accomplished in the scenario to be more focused on the actual situations, and thereby became more like an overall order to solve a problematic geographic area or a specific part of the conflict. One important goal can be to initiate peace agreements in a conflict area through discussions. In that situation it can be crucial not to use actual military force since it can escalate to more violence. Commanders at all levels must then understand the major goal of peace agreements, and not act in a way that may jeopardize the initiated peace agreement.

One important question for future research is how to implement CI in a new C2 system, to ensure that CI is made clear at different levels of command. Bolstad and Endsley (2000) have shown that certain types of shared displays can enhance team performance. Among other things, displays in a C2 system need to better fit the different levels of command and time frames for the execution of actions, and even non-execution of actions, directly and indirectly included by the CI. The quality of the commanders’ ideas is of outmost value and is a critical factor for the functionality of the C2 system. The C2 system may not be able to compensate for commanders with poor intentions (Builder, Bankes, & Nordin, 1999). The data fed in to the C2 system must be of good quality, but at the same time the system must meet Human Factors considerations (user friendly, relevant information, workload etc.), function with the data fed into it, and in accordance with how CI need to be distributed in the network.

SLB is a new Swedish C2 system (partly implemented in the Armed Forces), where information can be distributed both by text, pictures and map overlays (map with superimposed symbols). CI should be used both with text and overlays, but the method for how this should be done and distributed in the network is not fully developed. Furthermore, questions like how the text part of



CI should be formulated, if overlays always should be used, and how distribution should be done, are of interest for further studies.

In the present study, CI was somewhat altered when transmitted from BaC to BtC, and also rated markedly clearer on a higher level than on the lower levels. This is very important since it indicates that the lower levels of command did not fully understand the highest commands intention of the mission. Thus, the major conclusion is that transmission and reception of Commanders Intent can be problematic in a military staff.

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