Assertiveness and Responsiveness in Teams; Essential for Mission Command

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ABSTRACT

Though differences in rank within military teams help to define responsibility, they may hamper necessary bottom up communication, jeopardizing performance and safety. In aviation, lack of bottom up communication was attributed to lack of assertiveness in junior team members, providing them with assertiveness training as a consequence.

However, failing upward communication may not only be related to junior member's characteristics but also to lack of responsiveness of the senior member. It was the purpose of this study to examine the connection between rank, assertiveness, responsiveness and team potency as indicator of effectiveness in teams.

Data were provided by 67 military crews, consisting of pilot and observer, during training-missions in a Naval Helicopter high fidelity simulator. In a post-flight questionnaire, both crewmembers provided ratings of the other member's assertiveness and responsiveness, and gave their own rating of team potency.

Results show a negative impact of pilot's rank on observer's assertiveness, while observer's rank was not related to pilot's assertiveness.

The higher the pilot's rank, the higher the observer's responsiveness, and the lower his own responsiveness, both irrespective of observer's rank. The higher the observer's rank, the more responsive the pilot was, again, irrespective of the pilot's rank.

Both crewmembers' rank was related positively to their own rating of team potency, but not to the rating by the other member.

A consistent positive connection was found between responsiveness and team potency; pilot's responsiveness was related positively to team potency as indicated by the pilot as well as the observer. The same pattern was found for the observer's attributed responsiveness.

These results confirm that responsiveness is essential in multi-rank military teams, with important consequences for Mission Command. Therefore, it is incorporated into existing initial and advanced RNL Navy Crew Resource Management training, to enhance mission readiness in our Navy and Marines.

ABOUT THE AUTHORS

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INTRODUCTION

Teams in a variety of fields (i.e. military, aviation, medicine) consist of team members who differ in status or rank (Jentsch & Smith-Jentsch, 2001; Salas, Wilson, Murphy, King & Salisbury, 2008). These hierarchy differences, besides showing seniority, serve as a means to define responsibility and guide the decision making process. However, a drawback of hierarchy in a team is its negative impact on communication, especially upward communication. Research in different environments like aviation and medicine show that communication failures due to hierarchy differences result in degradation of team performance to the point of unsafe situations (Jentsch & Smith-Jentsch, 2001; Reader, Flin, Mearns & Cuthbertson, 2007, Salas, Wilson, Murphy, King & Salisbury, 2008).
(Upward) communication problems regarding hierarchy are relevant for the Royal Netherlands Navy (RNLN) as the RNLN relies on teams existing of individuals who differ in rank, specialization and seniority. In the RNLN self-managed units, and teams within units operate using Mission Command (MC). In MC, indicating low-level allocation of authority and autonomy, the unit has to perform a certain mission and carries responsibility for its outcome. Often, these small self-managed teams have to perform their tasks under hazardous conditions. The teams consist of individuals with different specializations who work interdependently and autonomously toward a shared objective, thus being adaptive to complex and constantly changing environments (Cohen & Bailey, 1997). To optimize the chance of mission accomplishment, effective and efficient operation, and safety of the team and the operation, open communication in the team is vital.
Investigation of major air carrier accidents by the National Transportation Safety Board (NTSB) showed that in over 80% of these accidents, the first officer failed to monitor and challenge the captain, and therefore, that in many cases accidents could have been prevented if the first officer had acted in a more assertive way. Consequently, assertiveness training for junior members was implemented as part of their basic and advanced training (Jentsch & Smith-Jentsch, 2001). In the RNLN, assertiveness training for junior members was adopted as well. Complementary, closed-loop communication is trained as part of the Standard Operating Procedures (SOPs) to ensure transmission of a message. However, recent incidents indicate that there are still improvements to be made regarding communication.

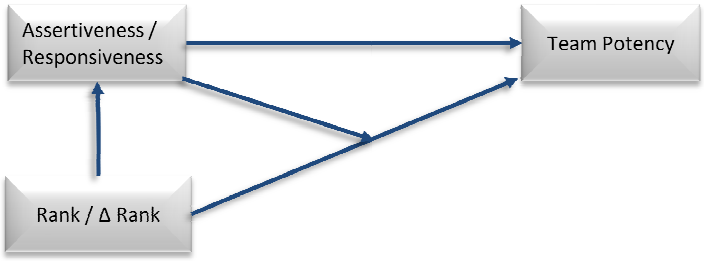

Figure 1 The effect of assertiveness/responsiveness on team potency, and the effect of rank/ Δrank on team potency, moderated by assertiveness/ responsiveness

Communication among team members may not only be dependent on the sender of a message (and/or a challenge), but also on the receiver. In this case (upward) communication in a ranked team may not only be related to junior member's assertive behavior but also to senior member's responsiveness (Richmond & McCroskey, 1990). If the senior does not respond to the challenge made by the junior team member, the junior members' assertiveness may be in vain. When the senior team member, on the contrary, acts in a responsive way, negative effects of differences in rank in a team may be reduced and even be absent. However, not only senior but also junior team members' responsiveness is likely to contribute to team effectiveness.
The purpose of this study is to examine the relative contribution of assertiveness and responsiveness of team members on team potency as a proximate indicator of team effectiveness. We are also interested whether assertiveness and/or responsiveness act as a moderating or intervening variable on the relation between rank/ Δrank

and team potency (Figure 1). Data are provided by two-member naval helicopter crews operating in high fidelity simulated training missions.
The results of this study are intended to support improvement of upward communication, thus enabling MC in self-managed RNLN teams, and, as a consequence, improve team effectiveness and performance.

Assertiveness and responsiveness in relation to team effectiveness

Research indicates that the benefits of extraversion on team performance may lie primarily in the sub dimension of assertiveness (Barry & Stewart, 1997). Assertiveness has been defined as the capacity to effectively communicate in interpersonal encounters by sharing ideas clearly and directly (Wolpe & Lazarus, 1966; in Pearsall & Ellis, 2006). Dispositional assertiveness is closely tied to effective communication of ideas (Costa & Widiger, 1994; in Pearsall & Ellis, 2006). Assertive individuals show decisive, outspoken, forceful, and direct behavior (Bakan, 1966; Deluga, 1988) and share their ideas and information in a clear, confident manner (Hayes, 1991; in Pearsall & Ellis, 2006).
According to Richmond and McCroskey (1990) assertiveness includes: defends own beliefs, independent, forceful, has a strong personality, willing to take a stand, acts as a leader, aggressive, and competitive. Teacher assertiveness has found to be positively related to a relaxed, content, animated, dramatic and dominant communicator style (DiClemente, Ditrinco, Gibbons & Myers, 2013). Teacher and supervisor assertiveness correlated positively with student and employee motivation (McCroskey, Richmond & Bennett, 2006; Teven, McCroskey & Richmond, 2006). Supervisor trustworthiness, competence and employee attitude towards supervisor are related positively to assertiveness (Teven et al., 2006).
Research in a command-and-control simulation indicates that critical team member dispositional assertiveness positively affects team performance (Pearsall & Ellis, 2006). A critical team member is the person with the most influence on team performance due to his/her specialization and/or access to vital information needed by the other team members to perform their task. For non-critical team members, dispositional assertiveness was not correlated to team performance. Pearsall and Ellis (2006) indicate that noncritical team members remain on the receiving end, relying on the critical team member for information and expertise. Though no results are known, this may indicate that noncritical team members have to be responsive in order to receive the information provided by the critical team member.
Responsiveness includes: helpful, responsive to others, sympathetic, compassionate, sensitive to the need of others, sincere, gentle, warm, tender, and friendly (Richmond & McCroskey, 1990; Anderson, Martin, Zhong & West 1997). Teacher responsiveness was positively related to a friendly, attentive and open communicator style (DiClemente et al., 2013). Teacher and supervisor responsiveness correlated positively with student and employee motivation (McCroskey, Richmond & Bennett, 2006; Teven et al., 2006) and with job satisfaction (Diclemente et al, 2013; Teven et al, 2006). Supervisor trustworthiness, competence, legitimacy and expertise are related positively to responsiveness as well as employee attitude towards supervisor (Teven et al., 2006). Though there are no other results regarding performance (e.g. increased student grades, supervisor motivation), this indicates that responsiveness, in addition to assertiveness may contribute in improving (upward) communication, and team effectiveness.

Assertiveness, responsiveness and rank; consequences for performance

Status or hierarchy differences in a team, whether these differences are caused by differences in seniority, specialization, rank or experience, can hamper team performance due to influence differences related to status (Torrance, 1954; Berger & Zelditch, 1993, Smith-Jentsch, Salas & Baker, 1996; Lee & Ofsche, 1981). These influence differences may be the reason that upward communication in hierarchical teams (e.g. aviation and medical teams) has an improved chance of failing, causing critical incidents and accidents (Jentsch & Smith-Jentsch, 2001; Salas, Wilson, Murphy, King & Salisbury, 2008), especially when the critical person in a team is not the highest ranked person (Pearsall & Ellis, 2006). As an individual's assertiveness can improve his/her influence in a team (Smith-Jentsch, Salas & Baker, 1996), assertiveness training has been implemented in a variety of fields (Salas et al., 2008; Lin, Shiah, Chang, Lai, Wang, Chou, 2004). Training results regarding team performance are mixed (Salas et al., 2008; Pearsall & Ellis, 2006), indicating that while the critical person's assertiveness is important, responsiveness of the other team members may be equally important.

Status and influence in a team
Hierarchy is the way in which an organization or team is employed to handle exceptions. In a complex dynamic task environment with high uncertainty and frequent exceptions, information processing of the hierarchy can quickly

overload, resulting in degradation of team performance (Lambert , Kunz & Levitt, 2001). In the military functionality of rank lies in the decision making process when the team finds itself in critical situations (Hunt & Callaghan, 2008).
Accident reports have indicated that a junior officer failing to challenge the senior officer resulted in some (in)famous accidents in a variety of fields, e.g. the PANAM-KLM airplane collision on Tenerife in 1977 and, more recently, the collision and capsizing of the Costa Concordia cruise vessel in 2012. Milanovich, Driskell, Stout and Salas (1998) conducted research on cockpit dynamics, and more specifically, on the reason why too often, "captains fail to listen and first officers fail to speak" (p155). They concluded that the pattern of authority relations between captain and first officer can be seen as status differences, which is of major influence on the communication problems. Status or (military) rank is related to influence: a person higher in military rank exerts more influence than a lower-ranked team member (Berger & Zelditch, 1993; Torrance, 1954). Besides rank, an individual's skills and abilities needed for mission-goal attainment (specialization) and an individual's assertiveness are related to influence (Smith-Jentsch, Salas & Baker, 1996; Berger & Zelditch, 1993; Lee & Ofsche, 1981). Assertive team members are more persuasive to others, facilitating the communication process in team contexts (Marks, Zaccaro & Mathieu, 2000). Therefore, a lower-ranked assertive, specialized team member might level rank-related influence of the higher-ranked member.

Results of implementation of assertiveness training for lower-ranked members
Research in the field of medicine indicates that, although assertiveness training for junior team members has been adopted, status related upward communication failures are still responsible for critical incidents and accidents (Salas et al., 2008). Therefore, Salas (et al., 2008) advise to use closed-loop communication as a means to overcome the status-related upward communication failures.
Participants in this study are all military personnel. Closed-loop communication is trained as part of their SOPs. However, there are still incident and accident reports regarding failing upward communication. There is anecdotic evidence that verbally repeating a message can become an automated response. Therefore, closed-loop communication does not necessarily guarantee that the content of the message is properly received, processed and understood. Responsiveness might be the answer to this problem, as well as to the problem of failing upward communication.

Team potency as a proxy measure of team performance

Team effectiveness refers to the team capability to perform under real-world conditions (Flay, 1986), while team potency refers to broader perceptions of the team regarding tasks and situations under various conditions (Campion, Papper & Medsker, 1996; Gully, Joshi, Incalcaterra & Beaubien, 2002). Team potency is related positively to team performance (Gully et al., 2002). In this study, 2-member teams are observed while they are operating in a Westland Lynx helicopter simulator designed to replicate real-world conditions as closely as possible. Flight hours in this simulator are regarded as real-world flight hours. Therefore, post-mission team potency can be used as a proximate indicator for team effectiveness.

Study Approach

In this study we examine the effect of assertiveness and responsiveness on team potency (Figure 1). We expect that both assertiveness and responsiveness are related positively to team potency.
Additionally, we will examine the effect of rank and difference in rank (Δrank) on assertiveness and responsiveness. We expect a positive effect of rank on assertiveness and a negative effect of rank on responsiveness, regardless of the other members' rank. For the lower-ranked team member, we expect a negative relation between Δrank and assertiveness and a positive relation between Δrank and responsiveness. For the higher-ranked team member, we expect a positive relation between Δrank and assertiveness and a negative relation between Δrank and responsiveness (Figure 1). This rank-effect on assertiveness and responsiveness could be due to the effect of an individuals' rank on the other person's rank, which would indicate an interaction effect for rank. The effect could also be dependent on the difference in rank (Δrank) between the two members instead of on the interaction between ranks. In this study we will examine both options.
Finally, we will examine the effect of rank and Δrank on team potency. We expect a direct negative relationship between rank/ Δrank and team potency. We expect that responsiveness, in addition to assertiveness, will be an intervening variable in this relation, decreasing the negative effect of rank on team potency (Figure 1).

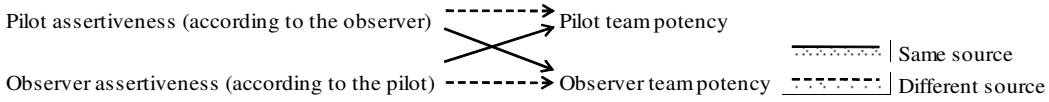

Figure 2 Same-source and multi-informant approach in data collection

To minimize common method biases, a multi-informant approach is used to examine the connection between assertiveness, responsiveness, and team potency. This indicates that, in 2-member helicopter crews, when presenting data concerning the relation between e.g. pilot assertiveness and pilot team potency, the data for each variable comes from different sources. When we present data regarding e.g. the effect of observer assertiveness on pilot team potency, the information comes from the same source (Figure 2). The same approach is used for responsiveness.

Study Context

The RNLN has s long history of operations across the globe in a variety of fields. The line-of-command, allocation of authority and means and structure of communication have evolved into the way communication and command are handled today. Mission Command (MC) is a philosophy regarding the allocation of autonomy and authority. Mission outcome relies heavily on communication within RNLN self-managed teams as they operate in a flexible, uncertain and hazardous environment. To optimize mission readiness, the RNLN has trained their teams on technical as well as non-technical (i.e. human factor related) skills. This study is a result of the intention to improve (upward) communication as part of team skills regarding human factors based on recent incidents and accidents.

Mission Command in the RNLN

For 526 years, the RNLN has practiced MC in various degrees throughout the organisation (Van Egmond & Van Willigenburg, 2013). "MC is a command approach based upon the exercise of local initiative within the framework of commander's intent. This is enabled by an appropriate delegation of authority and responsibility that allows subordinate commanders the latitude to plan and conduct operations based upon their understanding of the local situation" (Stewart, 2010; p1). In the 1980s the US Marine Corps (USMC) realised that in order to use the Manoeuvre Warfare approach (fast flexible operations in order to attack vulnerable enemy elements), MC was needed. Since 1989, the changing perspective of the global political situation forced the RNLN to restructure its tasks, and allocation of authority shifted within the organisation as well. Former so called Blue-water operations shifted to Brown-water operations and the emphasis shifted from long term to fast and flexible operations. Development of shared information and tracking devices further influenced the way units and teams communicated and operated. The Netherlands Defence Doctrine (2005) states that "increasing variability of situation needs delegation of authority and responsibility to low level command".

In the distant past, when there were no means of communication between RNLN headquarters and fleet, the commanding officer of a warship had both the autonomy and authority to act as he thought was necessary regarding the ship and her crew. Nowadays, though there are more means of communication, a commanding officer of a Royal Netherlands Naval Unit (fleet, marines or air arm) still has this level of authority (Van Egmond & Van Willigenburg, 2013).

Communication training in the RNLN

The RNLN air arm collaborates with the US Naval air arm and introduced Crew Resource Management (CRM) Training as part of its basic training as provided by the US Navy in 1993. CRM was designed to promote human factors skills in addition to technical skills trained in basic and advanced military training and education. Since 2008, all RNLN midshipmen received CRM training. In 2012, in close collaboration with the CRM team of the Naval Aviation Schools Command of the US Navy, CRM was incorporated into marines and fleet basic and operational readiness training.

Assertiveness training, as part of communication training, is integrated in both CRM training and leadership training for fleet, marines and air arm. These trainings are mandatory in basic training and return in advanced courses during operational readiness training. Closed-loop communication is trained as part of the SOPs. Assertiveness is treated as a means to challenge other team members: 'speaking up when necessary'.

Leadership coaches / trainers working with RNLN operational teams observed that, although (senior) team members thought they listened when challenged by another (junior) team member, this was not always experienced by the challenger. When team members were willing to monitor as well as challenge each other (based on their specialization and regardless of rank) they experienced openness of (upward) communication, and a reduction of the constrains caused by hierarchy differences.

METHOD

Participants and setting

The study was conducted at Naval Air Station De Kooy in Den Helder, the Netherlands. Flight crewmembers of the Westland Lynx Helicopter community of the Dutch (7(NL)SQN and 860(NL)SQN), German and Danish Navy and the Portuguese and Norwegian Air force participated in this research. The data used to test the hypotheses is part of a larger data collection effort.

All examined teams were 2-person military helicopter crews, both participants seated in the cockpit. The seating in the cockpit corresponds with the function, tasks and responsibilities during the flight. The pilot is always in the right seat (RS). In each crew the pilot is responsible for (a) flying the helicopter (b) the safety and status of the helicopter and (c) communication regarding the helicopter (i.e. with air traffic control). In the left seat (LS) is a tactical co-ordinator (tacco), a co-pilot, or an instructor. The LS is responsible for (a) navigation, (b) procedure handling, (c) tactical communication, and (d) the mission. Overall, while the pilot controls the aircraft, the observer controls the operation. Mission goal achievement requires crewmembers to operate interdependently, with the amount of dependency varying according to the scenario.

All teams participating in this study are ad-hoc teams. As the data were collected during regular training (both initial and recurrent), preparation for mission readiness, and testing, all crewmembers had extensive interaction before and after the data collection.

This study includes data from 66 military officers, 31 pilots (RS) and 35 LS members, flying a total of 67 missions. In 38 flights, the LS was a tacco, in 22 flights a co-pilot and in 7 flights an instructor. 64 male and 2 female crew members participated with an average age of: RS 35 years (SD = 8.11)/LS 32 years (SD = 5.30). Rank ranged from ensign to commander. Crew composition changed every flight.

Measures

Data were collected in an eight month period during regular training and testing of both individuals and crews. Apart from rank, all data were collected using questionnaires. The participants carried out the questionnaires directly after the flight prior to the debriefing. Interaction between the team members was not allowed. All questionnaire items were presented in English, as English is the international standard language in aviation. All items are scored on a 6-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree) with 0 (not applicable).

Status

All participants were military officers. Ranks ranged from Ensign to Commander. To examine whether the difference in rank is important Δrank (RSrank – LSrank) was computed. ΔRank ranged from -5 to 2. When we had to split the data on seniority, low ranked officers are junior officers (ensign, lieutenant jg, and lieutenant), high ranked officers are senior officers (lieutenant-commander, and commander).

Assertiveness and responsiveness

Assertiveness and responsiveness were measured using 6 items from Richmond & McCroskey's Assertiveness Responsiveness Measure (ARM, 1990). It consists of two separate dimensions: assertiveness and responsiveness. Assertiveness and responsiveness were found to be internally reliable and uncorrelated factors of self-reported personality style (Richmond & McCroskey, 1990; Teven et al., 2006; DiClemente, Ditrinco, Gibbons & Myers, 2013). We adapted the items so the questions were about the other member's behavior.

The 3 assertiveness items included "My colleague was independent", 'My colleague was willing to take a stand", and "My colleague was assertive". The 3 responsiveness items included "My colleague was helpful", "My colleague was responsive to me", and "My colleague was sensitive to my needs".

Team potency

3 Items developed by Campion, Papper & Medsker (1996) were used to measure team potency. The items were adapted in to the situation and included "Our crew shared a lot of team spirit","Our crew was able to effectively solve deviations from standard flight plan", and "I felt that our crew had great confidence in their ability to perform".

Analysis

In order to examine the direct relations between variables, we computed Pearson correlations. To minimize common method biases, both same-method as a multi-informant approach were used to examine the connection between

assertiveness, responsiveness and team potency in the other (Figure 2). Though team potency ratings of the RS and LS correlated (r = .49, $p < .01$), we used them separately in order to avoid same-source bias.
To investigate whether there was a interaction effect of rank and Δrank on assertiveness and responsiveness and to examine the moderating effect of assertiveness and responsiveness on the relation between rank/ Δrank on team potency we used a hierarchical multiple regression analysis with all the related variables in the first step and the product of the possible moderating variables in the second step.

RESULTS

Table 1 provides the descriptive statistics, correlations and scale reliabilities for the study variables. The mean of RS rank and LS rank shows that overall, the LS was higher in rank than the RS. Difference in rank (Δrank) is computed (RS Rank – LS Rank). Therefore, when the LS is the senior and RS is the junior Δrank will be negative, thus a negative correlation exists between LS rank and Δrank ($r = -.53$), and a positive correlation exists between RS rank and Δrank ($r = .60$).

Main effects of assertiveness and responsiveness

The first hypotheses suggested that there is a positive relationship between assertiveness and team potency and that there is a positive relationship between responsiveness and team potency. Results from the correlations show that pilot assertiveness is significantly correlated to observer team potency ($r = .26$, $p < .05$). Data regarding this relation are provided by the same source (the observer) (Table 1).

Table 1 Descriptive statistics and correlations

	Variable	1	2	3	4	5	6	7	8	9	m	sd	N
1	RS Rank	-									7.313	1.003	67
2	LS Rank	.245**	-								7.836	0.828	67
3	Difference in rank	.603***	-.530***	-							-0.582	1.257	67
4	RS Assertiveness	-.082	-.124	.046	(.69)						3.739	0.644	67
5	LS Assertiveness	-.242**	-.102	-.146	.246**	(.73)					3.763	0.645	66
6	RS Responsiveness	-.155	.175*	-.225**	.165*	.014	(.73)				4.152	0.523	67
7	LS Responsiveness	.184*	.130	.091	.017	.083	.072	(.77)			4.242	0.420	66
8	RS Team potency	.254**	.126	.128	.111	-.097	.205**	.356***	(.81)		4.061	0.506	66
9	LS Team potency	.167*	.179*	.016	.261**	.002	.448***	.295***	.487***	(.67)	4.002	0.447	67

Note. Scale reliabilities (Cronbach's alphas) appear on the diagonal

*. Correlation is significant at the 0.1 level (1-tailed).

**. Correlation is significant at the 0.05 level (1-tailed).

***. Correlation is significant at the 0.01 level (1-tailed).

Table 1 shows that responsiveness and team potency are correlated positively, both same source (RS $r = .45$, $p < .01$; LS $r = .36$, $p < .01$) and different source (LS-RS $r = .21$, $p < .05$; RS-LS $r = .30$, $p < .01$) (Table 1).
A positive relation between pilot assertiveness and observer assertiveness has been found ($r = .25$, $p < .05$). A positive relation has been found between pilot assertiveness and pilot responsiveness ($r = .17$, $p < .10$). No relation between observer assertiveness and observer responsiveness was found ($r = .08$, ns).

Main effects of rank and Δrank

The next hypotheses suggested a positive effect of rank on assertiveness and a negative effect of rank on responsiveness. Table 1 shows that there is no direct relation between rank and assertiveness (RS $r = -.08$ ns; LS $r = -.10$ ns). A cross effect of rank on assertiveness is found for the relation between RS rank and LS assertiveness ($r = -.24$, $p < .05$). Table 1 shows there is no direct relation between rank and responsiveness (RS $r = -.16$ ns; LS $r = .13$ ns). A moderate cross effect of rank on responsiveness is found for both the relation between RS rank and LS responsiveness ($r = .18$, $p < .10$), and the relation between LS rank and RS responsiveness ($r = .18$, $p < .10$).
As shown in Table 1, a relation is found between Δrank and RS responsiveness ($r = -.23$, $p < .05$). To examine whether this effect has to be treated as a separate variable or an interaction effect between the RS and the LS, we conducted a multiple regression analysis with RS rank and LS rank in the first step, either Δrank or RS_rank*LS_rank in the second step and RS/LS responsiveness as dependent variable (ns). Table 1 shows the direct relation between rank and team potency. There is a positive relation between RS rank and RS team potency ($r = .25$, $p < .05$) and LS team potency ($r = .17$, $p < .10$). There is a positive relation between LS rank and LS team potency ($r = .18$, $p < .10$).

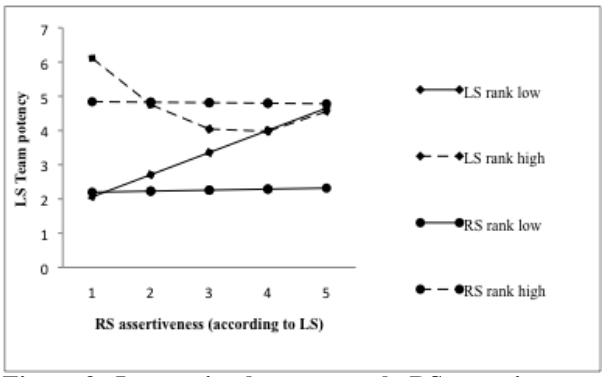

Figure 3a Interaction between rank, RS assertiveness and LS team potency

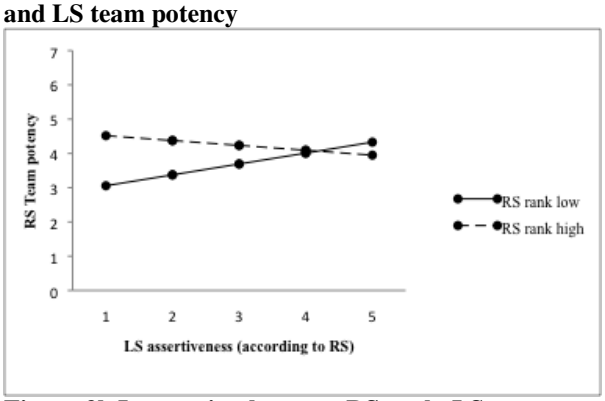

Figure 3b Interaction between RS rank, LS assertiveness and RS team potency

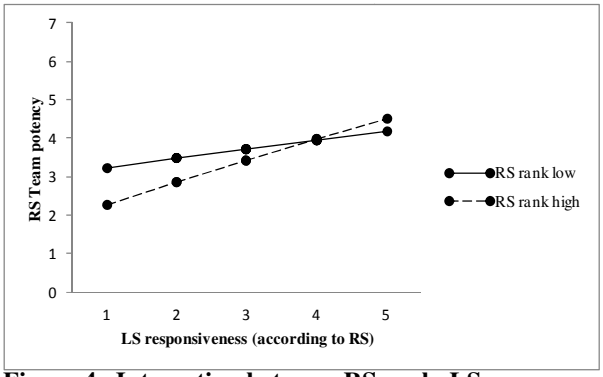

Figure 4a Interaction between RS rank, LS responsiveness and RS team potency

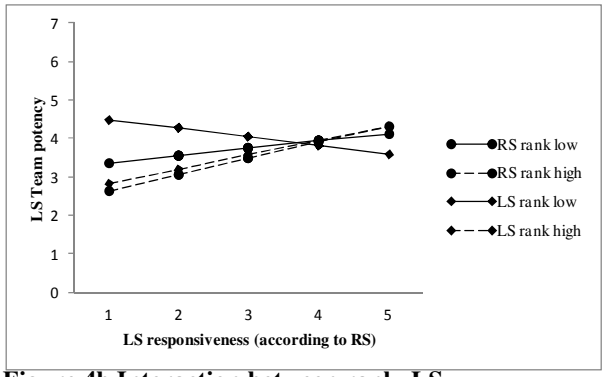

Figure 4b Interaction between rank, LS responsiveness and LS team potency

Results indicated that neither Δrank nor the interaction between RS rank and LS rank has an additional contribution on the individual effects of RS rank/LS rank on responsiveness.

Interaction effect of rank and assertiveness on team potency

Literature and practice indicate that there is a negative relationship between the interaction of rank*assertiveness on team potency. To examine this possible interaction we conducted a multiple regression analysis with rank and assertiveness in the first step, the product in the second step and team potency as dependent variable. A negative moderating effect of RS assertiveness (according to LS) is found on the relation between RS rank and LS team potency ($\Delta R^2 = .10$, $p < .01$). Figure 3a shows the difference in contribution of pilot assertiveness on observer rank when the pilot rank is taken into account. As can be seen, the observer values pilot assertiveness more of senior pilots ($F = 3.00$, $p < .10$) then of junior pilots ($F = 26.36$, $p < .01$).

Results show a negative moderating effect of RS assertiveness on the relation between LS rank and LS team potency ($\Delta R^2 = .08$, $p < .05$) as well. As Figure 3a shows, the way the observer experiences pilot assertiveness is dependent on observer seniority. For junior observers, increased pilot assertiveness improves team potency ($F = 25.44$, $p < .01$). When the observer is a senior officer, this relation is quadratic ($F = 7.20$, $p < .01$) instead of linear ($F = .19$, ns). Results show a negative moderating effect of LS assertiveness on the relation between RS rank and RS team potency ($\Delta R^2 = .05$, $p < .10$; Figure 3b). Junior pilots experience increasing team potency with increasing observer assertiveness ($F = 4.05$, $p < .05$). For senior pilots, no significant relation between observer assertiveness and pilot team potency was found ($F = .93$, ns).

Interaction effect of rank and responsiveness on team potency

Practice indicates there may be a moderating effect of responsiveness on the relation between rank and team potency. Therefore, we conducted a multiple regression analysis with rank and responsiveness the first step, the product in the second step and team potency as dependent variable. A positive moderating effect was found of LS responsiveness (according to RS) on the relation between RS rank and RS team potency ($\Delta R^2 = .06$, $p < .01$). Figure 4a shows this interaction. For junior pilots, no relation between observer responsiveness and pilot team potency was found ($F = 2.13$, ns). For senior pilots, a positive relation was found between observer responsiveness and pilot team potency ($F = 5,06$, $p < .05$).

A positive moderating effect of LS responsiveness on

the relation between RS rank and LS team potency ($\Delta R^2 = .04$, $p < .10$) as well as on the relation between LS rank and LS team potency ($\Delta R^2 = .04$, $p < .10$) was found. Figure 4b shows these interaction effects. For RS rank low ($F = .89$, ns) no relation between LS responsiveness and LS team potency was found. A positive relation between LS responsiveness and LS team potency was found for RS rank high ($F = 2.23$, $p < .05$). For LS rank low no relation between LS responsiveness and LS team potency was found ($F = .45$, ns). For LS rank high, LS responsiveness and LS team potency are related positively ($F = 7.89$, $p < .01$).

Cross-level moderating effect of assertiveness and responsiveness

As literature and practice indicate that assertiveness may moderate the effect of difference in rank on team potency, we conducted a multiple regression analysis with Δrank and RS/LS assertiveness in the first step, the product in the second step and team potency as dependent variable. Results show no moderating effects of assertiveness on the relationship between Δrank and team potency. We also did a 3-step multiple regression analysis to examine whether assertiveness may have a moderating effect on the interaction between RS rank and LS rank and team potency. Results show no relationship between RS_rank*LS_rank and team potency.

We were specifically interested in whether there is a moderating effect of responsiveness on the relation between difference in rank and team potency. Therefore, we conducted a multiple regression analysis as described above. The only significant moderating effect of LS responsiveness (according to the RS) is found on the relationship between Δrank and RS team potency ($\Delta R^2 = .05$, $p < .10$). To analyze whether Δrank had an additional value above the moderating effect of LS responsiveness on the relationship between RS rank and RS team potency, we conducted a multiple regression with RS rank*LS responsiveness in the first step and Δrank*LS responsiveness in the second step. The second step ($\Delta R^2 = .00$, ns) did not add anything to the first step ($\Delta R^2 = .22$, $p < .01$), thus the effect of Δrank is completely due to the effect of RS rank.

CONCLUSION

The expected direct positive relation between assertiveness and team potency was only found in one (of four) relations: when the observer experiences pilot assertiveness, s/he evaluates the team as more potent. No other direct results regarding assertiveness are found. The expected positive relation between responsiveness and team potency was found consistently for all possible relations (Table 1). We did not find the expected effect of Δrank on assertiveness and responsiveness. The expected negative effect of rank on team potency was not found. On the contrary: when the pilot is high ranked, both the pilot and the observer experience the team as more potent than when the pilot is low ranked. When the observer rank is high, s/he experiences the team as more potent than a lower ranked observer. No effect of Δrank on team potency was found.

We did not find the expected relationship between rank and assertiveness. However we found that the higher the pilot's rank, the lower observer assertive s/he experiences, regardless of observer rank (Table 1). As a consequence we did not find an effect of Δrank on assertiveness.

Low ranked pilots experience increasing team potency with increasing observer assertiveness. For high ranked pilots, no significant relation between observer assertiveness and pilot team potency was found (Figure 3b).

Overall, observers value pilot assertiveness more of high ranked pilots then of low ranked pilots, regardless of observer rank. The amount of assertiveness the pilot shows does not seem to be related to observer team potency, only pilot rank.

However, the way the observer experiences pilot assertiveness (regardless of pilot rank) is dependent on observer seniority. For junior observers, increased pilot assertiveness improves team potency. For senior observers, when the pilot shows increased assertiveness (according to the observer), until a certain degree the observer experiences less team potency. When the pilot shows assertiveness over this threshold, the team potency according to the senior observer increases, but it does not get to the degree of potency the senior observer experiences when the pilot is not assertive. Again this is not related to pilot rank (Figure 3a).

Assertiveness does not have a moderating effect on the relation between either difference in pilot and observer rank and team potency, nor on the relation between the interaction of pilot and observer rank on team potency.

We did not find the expected negative relation between rank and responsiveness. Instead, we found that rank and responsiveness are not related, i.e. all ranks show an equal amount of responsiveness (Table 1). But when the pilot is high in rank, s/he experiences the observer as more responsive then a low ranked pilot, regardless of observer rank (Table 1). For the observer, the amount of experienced pilot responsiveness is dependent on the difference between ranks: when the observer is higher in rank than the pilot, the pilot is more responsive (according to the observer) than when the pilot and observer are the same rank or when the pilot is higher in rank than the observer (Table 1). We did not find an effect of Δrank on responsiveness.

For teams featuring a low ranked pilot, observer responsiveness is not related to either pilot or observer team potency, regardless of observer rank. For high ranked pilots, a positive relation is found between observer responsiveness and pilot team potency, regardless of observer rank (Figure 4a). When the observer is accompanied by a high ranked pilot, increasing observer responsiveness results in increasing observer team potency, regardless of observer rank (Figure 4b).
Low ranked observer responsiveness (according to the pilot) is not related to observer team potency, but high ranked observer responsiveness has a positive effect on observer team potency (Figure 4b).

DISCUSSION

Optimal (upward) communication in self-managed military teams is essential for Mission Command. This study was conducted to get insight into the role of assertiveness and responsiveness in (upward) communication in military teams in order to support and enhance RNLN training and coaching related to Mission Command. The goal in this study was to examine the effect of rank (status), assertiveness and responsiveness on team potency as a proximate measure for team effectiveness. In this study, we found no direct relation between assertiveness and team potency, but we did find results when combining assertiveness and rank. While junior officers experience improvement of team potency due to team member assertiveness, senior officers experience degradation of team potency. It may be that junior officers feel that challenges from team members keep them sharp, therefore optimizing team potency, while senior officers interpret the challenge as 'something is going amiss', and therefore, perceived senior team potency decreases when the senior is challenged during the mission. Note that a negative senior officers relation between team members' assertiveness and team potency does not implicate that the senior officer does not listen or act on the challenges made.
In previous studies, the relation between responsiveness and team potency was not examined. In this study, we found a consistent direct positive relation between responsiveness and team potency. When examining the effect of rank on this relation it was found that senior officers experience increasing team members' responsiveness as positive on team potency, regardless of their team members' rank. For junior officers, we found no direction in the relation between responsiveness and team potency. We have no data regarding deciding and acting of the responsive team member on the challenge of the junior officer; responsiveness only gives an indication of the message being perceived. More research regarding this junior officers and responsiveness is needed to explain this specific result. Overall, the positive relation between responsiveness and team effectiveness confirm observations from practice in the RNLN. In MC the importance of responsiveness should be stressed, and when time-criticality curtails responsiveness, debriefing or feedback should be used to address the issue and continue support for responsiveness in a team.
The last effect we examined was the effect of difference in rank and interaction between ranks on assertiveness, responsiveness and team potency. Contradictory to what we expected due to accident reports and RNLN anecdotes, we found no results regarding the interaction between ranks; only individual rank was related to showing assertive and responsive behavior, and valuing it regarding team effectiveness.
It should be stressed that no enlisted personnel were part of this study and future research should address this issue more specifically before final conclusions regarding MC can be made.
Since February 2014, the preliminary results of this study regarding responsiveness were introduced as a pilot in CRM training/ coaching of RNLN operational fleet and marine teams. The teams and trainer/coaches experienced improvement of the communication, the decision-making process and team effectiveness. Therefore the RNLN is now introducing the final results of this study in all operational readiness training by Marine Training Command and Sea Training Command. In the future, the results will be incorporated into existing CRM basic and advanced training for fleet and marines. In this way, implementation of communication regarding MC will be trained in all stages of education and training of fleet and marine teams, and optimize mission readiness in our Navy and Marines.

REFERENCES

Anderson, C.M., Martin, M.M., Zhong, M. & West, D. (1997). Reliability, separation of factors, and sex differences on the assertiveness-responsiveness measure: a Chinese sample. *Communication Research Reports*, 14 (1), p 58-64
Bakan, D. (1966). The test of significance in psychological research. *Psychological Bulletin*, 66 (6), p 423-437
Berger, J. & Zelditch, J. (1993). *Theoretical Research Programs*. Stanford, CA: Stanford University Press
Berry, B. & Stewart, G.L. (1997). Composition, process, and performance in self-managed groups; the role of personality. *Journal of Applied Psychology*, 82 (1), p 62-78

Campion, M.A., Papper, E.M. & Medsker, G.J. (1996). Relations between work team characteristics and effectiveness: a replication and extension. *Personnel Psychology*, 49, p 429-452

Cohen S.G. & Bailey, D.E. (1997). What makes teams work: group effectiveness research from the shop floor to the executive suite. *Journal of Management*, 23 (3), p. 239-290

Deluga, R.J. (1988). The politics of leadership: the relationship between task-people leadership and subordinate influence. *Journal of Organizational Behavior*, 9 (4), p 359-366

DiClemente, R.K., Ditrinco, E.A., Gibbons, K.E. & Myers, S.A. (2013) The Relationship Between Instructor Job Satisfaction and Communicator Style and Socio-Communicative Orientation, *Communication Research Reports*, 30(4), p 347-351

Flay, B.R. (1986). Efficacy and Effectiveness trials (and other phases of research) in the development of health promotion programs. *Preventive medicine*, 15 (5), p 451-474

Jentsch, F.& Smith-Jentsch, K.A. (2001). Assertiveness and Team Performance: More Than "Just Say No". In E. Salas, C.A. Bowers & E. Edens (Eds.), *Improving Teamwork in Organizations: Applications of Resource Management Training* (p 73-94). Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Gully, S.M., Joshi, A., Incalcaterra, K.A. & Beaubien, J.M. (2002). A meta-analysis of team efficacy, potency, and performance: interdependence and level of analysis as moderators of observed relationships. *Journal of Applied Psychology*, 87 (5), p 819-832

Hunt, G. J. F. & Callaghan, K. S. N. (2008) Comparative issues in aviation and surgical crew resource management: Are we too solution focused? *ANZ Journal of Surgery*, 78, 690–693

Lambert, M.H., Kunz, J. & Levitt, R.E. (2001). Hierarchies and Transactive Memory Systems: Crafting a Model of Flexible Exception Handling. *Proceedings of CASOS 2001 Conference*

Lee, M.T. & Ofsche, R. (1981). The impact of behavioural style and status characteristics on social influence: a test of two competing theories. *Social Psychology Quarterly*, 44 (2), p 73-82

Lin, Y-R, Shiah, I-S, Chang, Y-C, Lai, T-J, Wang, K-Y & Chou, K-R (2004). Evaluation of an assertiveness training program nursing and medical students' assertiveness, self-esteem, and interpersonal communication satisfaction, *Nurse Education Today*, 24, p 656-665

Marks, M.A., Zaccaro, S.J. & Mathieu, J.E. (2000). Performance implications of leader briefings and team-interaction training for team adaptation to novel environments. *Journal of Applied Psychology*, 85 (6), p 971-986

McCroskey, J.C., Richmond, V.P. & Bennett, V.E. (2006). The relationships of student end-of-class motivation with teacher communication behaviours and instructional outcomes. *Communication Education*, 55 (4), 403-414

Milanovich, D.M., Driskell, J.E., Stout, R.J. & Salas, E. (1998). Status and cockpit dynamics: a review and empirical study. *Group dynamics: theory, research, and practice*, 2 (3), p 155-167

Pearsall, M.J. & Ellis, P.J. (2006). The effects of critical team member assertiveness on team performance and satisfaction, *Journal of Management*, 32, p 575-594

Reader, T.W., Flin, R., Mearns, K. & Cuthbertson, B.H. (2007). Interdisciplinary communication in the intensive care unit, *British Journal of Anaesthesia*, 98 (3), p 347-352

Richmond V.P. & McCroskey J.C. (1990). Reliability and separation of factors on the assertiveness-responsiveness measure, *Psychological reports*, 67, p 449-450

Salas, E., Wilson, K.A., Murphy, C.E., King, H. & Salisbury, M. (2008). Communicating, Coordinating, and Cooperating when lives depend on it: tips for Teamwork, *The Joint Commission Journal on Quality and Patient Safety*, 34 (6), p 333-341

Smith-Jentsch, K.A., Salas, E. & Baker, D.P. (1996). Training team performance-related assertiveness. *Personnel Psychology*, 49 (4), p 909-936

Stewart, K.G. (2010). The Evolution of Command Approach. *15th International Command and Control Research and Technology Symposium (ICCRTS)*. CCRP Publications, Department of Defense

Teven, J.J., McCroskey, J.C. & Richmond, V.P. (2006). Communication correlates of perceived Machiavellianism of supervisors: communication orientations and outcomes. *Communication Quarterly, 54(2)*, p 127-142

Torrance, E.P. (1954). The behavior of small groups under stress of conditions of "survival". *American Sociological Review*, 19, p 751-755

Van Egmond, C. & Van Willigenburg, A. (2013). Opdrachtgerichte commandovoering of Mission Command: meer dan een mindset. *Marineblad*, 9-13, p 4-7