

EFFECTS OF NETWORK ORGANIZATION

Exploring network organization in military contexts – effects of flatter structure and more
decentralized processes

Anne Lise Bjørnstad

Norwegian Defence Research Establishment and University of Oslo

Authors' note

Anne Lise Bjørnstad, Information Management Department, Norwegian Defence Research Establishment, and Institute of Psychology, University of Oslo.

The author thanks members of the NATO research group, Human Factors and Medicine (HFM), Research and Technology Group (RTG) – 138 for valuable discussions and contributing to the study 1 data collection. Thanks go to Frederick M. J. Lichacz (Defence R & D Canada, Ottawa) for the study 3 data collection, and to Pål Ulleberg and Knut Inge Fostervold (University of Oslo, Norway) for helpful discussions on analyses and feedback on earlier versions of the manuscript.

Correspondence should be addressed to Anne Lise Bjørnstad, Norwegian Defence Research Establishment (FFI), P. O. Box 25, 2027 Kjeller, Norway; e-mail: anne-lise.bjornstad@ffi.no.

Abstract

Changes in the tasks and responsibilities of military organizations in recent decades have prompted new organizational solutions collectively known as *network* organization. Network organization includes changes to central organizational variables such as structure and processes. The present study explores potential effects of such changes in military contexts – that is, of flattening structure, decentralizing processes, aligning structure and processes, and increasing flexibility. To this end, self-report data were collected in three different military exercise organizations. Results indicate that perceptions of flat structure and decentralized processes both predict organizational effectiveness with almost full mediation by flexibility. No conclusions were drawn pertaining to the direct and moderating effects of alignment. Interpretations and implications for the implementation of network organizational changes in military contexts are discussed.

Keywords: Network organization, effectiveness, flat structure, decentralized processes, alignment, flexibility.

Military organizations have experienced great changes in their tasks and responsibilities in recent decades. Cold war predictability has been replaced by rapidly changing and increasingly complex tasks and environments. These challenges call for changes to traditional military organizational structures and processes (e.g., Alberts & Hayes, 2003). At the same time, developments in information and communication technologies have created new opportunities for collaboration and information sharing, improving the possibilities for more efficient organizational structures and processes (e.g., Alberts & Hayes, 2003; Atkinson & Moffat, 2005; Volberda, 1998).

Network organization

Network organization has been proposed as a solution to address the changes and new challenges in both civilian and military contexts. The ideas and organizational designs associated with network organization emerged in the civilian sector during the 1980s. Their introduction was mainly a result of market changes alongside new technology developments (e.g., DeSanctis & Poole, 1997; Snow, Miles & Coleman, 1992; Tiernan, Flood, Murphy, & Carrol, 2002). By the beginning of the twenty-first century, a military approach to network organization emerged (e.g., Alberts, Garstka, & Stein, 1999; Alberts & Hayes, 2003; Atkinson & Moffat, 2005).

Common to both the civilian and military approaches to network organization is the understanding that network organization represents a move away from traditional bureaucratic types of organization, with a hierarchical structure and centralized, stove-piped authority and decision-making processes, in favor of flatter, more decentralized and flexible types of organization (e.g., Alberts & Hayes, 2003; Atkinson & Moffat, 2005; DeSanctis & Poole, 1997; Snow et al., 1992). Network organization is expected to promote both more adaptable and efficient organizations (e.g., Alberts & Hayes, 2003). Many military organizations, NATO

included, are currently planning for changes to bring military organizations toward network enabled capabilities (e.g., NATO Network Enabled Capabilities [NNEC]; Bartolomasi, et al., 2005). The trend within military organizations to focus mainly on technological networks (e.g., Bartolomasi, et al., 2005) indicates a need for research that focuses on organizational issues.

Flat structure

Formalization, a classic feature of hierarchical organization, has been argued to impede flexibility (e.g., Englehardt & Simmons, 2002; Volberda, 1998; Zammuto & Krakower, 1991). For example, when information must travel through the many levels of a hierarchy, the information becomes increasingly degraded with each level through which it must pass. At the same time, the information-sharing process becomes increasingly time-consuming (Volberda, 1998). In turn, such inefficient processes will affect both the ability to make timely and appropriate decisions and the ability to take action within the time available. This problem is exacerbated when the organization faces new challenges. Volberda (1998) argued, in line with military network theories (e.g., Alberts & Hayes, 2003), that flatter structures provide the foundation for flexibility and faster decision-making procedures. These contentions remain theoretical, however, because little has been done to test them empirically. Hence, it is proposed that (Hypothesis 1) flat organizational structure will influence flexibility and effectiveness positively in military organizations.

In this study, structure (flat/hierarchy) is operationalized as the degree to which the organization is perceived to be flat (as opposed to hierarchical; e.g., Volberda, 1998). In line with the suggestions of Kozlowski & Ilgen (2005), *effectiveness* is operationalized as key team processes (i.e., information sharing, decision making, and organization rating) that have been shown to affect organizational output (e.g., Benbasat & Lim, 1993; Campion, Medsker &

Higgs, 1993; Khanna & New, 2008; Mesmer-Magnus & DeChurch, 2009; Tiernan et al., 2002). The centrality of information quality and amount in military network theories (e.g., Alberts et al., 1999) further motivated the operationalization of information sharing as the perceived quality and amount of information shared. Reflecting commonly used measures of effectiveness (e.g., Benbasat & Lim, 1993; Khanna & New, 2008), decision making is operationalized as the perceived timeliness, quality, and success of decisions. In accordance with past studies (e.g., Khanna & New, 2008; Tiernan et al., 2002) personnel evaluations of the organization represents the operationalization of organizational rating. Finally, based on previous research (e.g., Dennis, 1996), it is expected that the effectiveness measures may be internally related, in terms of information sharing partly mediating some of the effects on decision making and organization rating.

Decentralized processes

Another central feature of network organization is the distribution of power and authority to the lower echelons of the organizational hierarchy (e.g., Alberts & Hayes, 2003; Atkinson & Moffat, 2005; Snow et al., 1992), enabling decentralized processes (e.g., Sheremata, 2000). Decentralization means shorter information-sharing and decision-making loops (e.g., Roman, 1997), and an increased number of individuals who are able to make decisions (e.g., Alberts & Hayes, 2003; Galbraith, 2002). This line of reasoning suggests that decentralized processes enhance both the speed and capacity of the organization to handle large numbers of simultaneous tasks in a dynamic environment, understood to be crucial to achieving flexibility (e.g., Alberts & Hayes, 2003; Englehardt & Simmons, 2002; Galbraith, 2002; Volberda, 1998). Empirical investigations of the link between decentralization and flexibility are sparse from military contexts, though equivocal findings have been demonstrated from different civilian contexts

(e.g., Hatum & Pettigrew, 2006; Zammuto & Krakower, 1991). The present research endeavors to research this issue, and proposes that (Hypothesis 2) decentralized processes will influence flexibility and effectiveness positively in military organizations. In this study, *processes* (decentralization/centralization) is operationalized as the degree to which the organizational processes are perceived as decentralized or centralized by its members.

Flexibility

Flexibility is a central part of network theories, expected to enable increased information sharing and collaboration across hierarchies and services, facilitating high-quality, timely decisions and responses as well as operational efficiency (e.g., Alberts & Hayes, 2003). Although flexibility has been found to increase effectiveness in empirical research (e.g., Campion, et al., 1993; Patterson, et al., 2005), such research is lacking from a military context. From this, it is suggested that (Hypothesis 3) flexibility partially mediates the hypothesized relationships between structure and effectiveness, and between processes and effectiveness. In this study, *flexibility* is operationalized as the perceived ability of the organization to respond adaptively to the demands of the environment (Hatum & Pettigrew, 2006).

Alignment of structure and processes

Many organizational theories (e.g., Galbraith, 2002; Kotter, 1978) have suggested that alignment of core organizational variables is central to an organization's effectiveness. This view implies that if a fit between variables such as structure and processes is not ensured in organizational development, the organizational changes implemented could result in a decrease rather than an increase in effectiveness. For instance, if the structure is changed from hierarchical to flat at the same time as the decision-making authority is centralized at the top end, the decision-making load on the top management is liable to become too heavy and render the

organization inefficient. This has been exemplified in studies of both civilian (Kvande, 2007) and operational military (Vego, 2003) organizations, suggesting that alignment of structure and processes may influence the effects of structure and processes. Unless controlled for, a lack of alignment would make it difficult to decipher which organizational solutions may be most advantageous. Hence, it is proposed that (Hypothesis 4) alignment between structure and processes moderates the effects of flat structure and decentralized processes, as well as having direct effects on flexibility and effectiveness. In this study, *alignment* is operationalized as the congruence between structure and processes. The conceptual model of the hypotheses is presented in Figure 1.

[Insert Figure 1 about here.]

Method

Participants and procedures

Survey data were collected from three different military exercise organizations at three different points in time: the Allied Warrior (AW04) exercise in 2004 (study 1), the Battle Griffin (BG05) in 2005 (study 2), and the fourth Multinational Experiment exercise (MNE4) in 2006 (study 3). The purpose of the AW04 was to exercise and establish the readiness of the NATO Response Force (NRF), the BG05 purpose was to train NATO forces in extreme cold weather conditions, and the MNE4 purpose was to train NATO multinational coalition and civilian-military collaboration. Personnel at the Combined Joint Operations Center (CJOC) of the Deployed Joint Task Force (DJTF) Head Quarter (HQ) in AW04 was chosen for study 1 as the organizational unit had been changed according to new demands for a more effective organization. A tactical-level army unit in BG05 was chosen for study 2 because this unit represented a new organizational element, aiming to increase organizational effectiveness. The MNE4 exercise organization was chosen for study 3 based on its focus on effectiveness in

coalition and military-civilian collaboration. The AW04 was a command post exercise (CPX, i.e., run by an exercise command), where the activities in the DJTF included premission training, practicing crisis response planning procedures, and establishing the DJTF and command & control (C2) structure in a theatre of operations. The scenario in BG05 included ethical conflicts and asymmetric threats, where the tactical level unit of our focus was charged with collecting, analyzing and distributing information during the exercise. In MNE4, the participants' task was to work together as a distributed coalition to halt a pre-crisis situation from developing into a war by identifying and assessing a variety of military and non-military interventions.

In all studies, the questionnaires were distributed to and completed by the participants onsite near the end of the exercises. In study 1, participants were personnel at the CJOC, where they contributed as a result of self-selection after information about the survey was communicated at a unit brief. In study 2, questionnaires were distributed to the entire unit. In study 3, questionnaires were net-based and distributed to all participants in the exercise. Because the working language in the exercises was English, the questionnaires were presented in English to all participants. Prior to the first data collection, the questionnaire was scrutinized and accepted by the Human Use Committee at the US Army Research Laboratory. Participants volunteered for the studies, and all information rendered was treated with confidentiality. There were a total of 239 participants, but due to missing values on one or more variables, 19 were excluded, bringing the sample to 220 for the analyses (details in Table 1).

[Insert Table 1 about here]

Measures

All measures were developed in-house. The developments were based on previous theory and research (e.g., Alberts et al., 1999; Benbasat & Lim, 1993; Tiernan et al., 2002; Zammuto &

Krakower, 1991) and earlier exploratory studies (e.g., Bjørnstad, 2002). The content validity of the items was established through peer-reviews, supplemented by semistructured pre-interviews (13) conducted with target raters on-site at the first study (AW04 exercise). The latter further served to tighten the questionnaire in terms of inadequate items being removed. The univariate characteristics (M and SD) of all items included in the current study are presented in Table 2.

Organizational structure, processes, flexibility, and alignment (independent and mediating variables)

Organizational structure, processes, and flexibility were each measured by one-item 5-point bipolar measurement scales. The lead stem was “In the following questions we ask you to compare this exercise-organization with the organization you normally work in. How would you describe...”. Organizational *structure (hierarchy/flat)* was assessed by the item “the level of hierarchy here?”. The response choices were *much more hierarchical (1)*, *a bit more hierarchical (2)*, *no difference (3)*, *a bit flatter (4)*, and *much flatter (5)*. Akin to the measure employed by Zammuto and Krakower (1991), organizational *processes (centralization/decentralization)* was assessed by the item “the level of centralization/decentralization (self-organization) here? ”. The response choices were *much more centralized (1)*, *a bit more centralized (2)*, *no difference (3)*, *bit more decentralized (4)*, and *much more decentralized (5)*. Organizational *flexibility* was assessed by the item “the flexibility here?”. The response choices were *much less flexible (1)*, *a bit less flexible (2)*, *no difference (3)*, *bit more flexible (4)*, and *much more flexible (5)*. *Alignment* was an estimate of the level of congruence between structure and processes, represented by a 5-point scale. Low scores indicate low congruence - that is, opposite scores on structure and processes (e.g., structure = 1 and

processes = 5), and high scores indicate high congruence; that is, identical scores on the two measures (e.g., structure = 1 and processes = 1).

Information sharing, decision making, and organizational rating (dependent variables)

Information sharing was assessed by two items, each with a unique 5-point bipolar measurement scale, measuring the perceived amount (item 1) and contentment (item 2) of the information. The lead stem was “Pertaining to this exercise...”. The wording of item 1 was “do you feel like you get too much or too little information in order to make decisions?”. The response choices were *too much* (1) *somewhat more than I need* (2) *appropriate amount* (3), *somewhat less than I need* (4), and *too little* (5). For the second item, worded “how content are you with the information you receive?”, response choices were *very content* (1), *somewhat content* (2), *neutral* (3), *somewhat discontent* (4), and *very discontent* (5). Item 1 was recoded into a 3-point scale so that high (3) signifies appropriate amount of information, and item 2 was recoded so that high (5) indicates very content with information. The Cronbach's alpha (based on standardized items) for the information sharing measure was .67.

Decision making was assessed by three items, each with a unique 5-point bipolar measurement scale, measuring the perceived timeliness (item 1), quality (item 2), and success (item 3) of decisions. The lead stem was “Pertaining to this exercise...”. The wording of item 1 was “in your opinion, are decisions made too slow, too fast, or just right in your environment? ”. The response choices were *too slow* (1) *a bit slow* (2) *just right* (3), *a bit fast* (4), and *too fast* (5). Another sample item was “how would you rate decision quality in your environment?” (item 2). Response choices for this item were *very good* (1), *good* (2), *neutral* (3), *poor* (4), and *very poor* (5). Response choices for item 3 ranged from *very successful* (1) to *not at all successful* (5). Item 1 was recoded into a 3-point scale where high (3) signifies very good timeliness (answer

category *just right*), item 2 was recoded so that high (5) indicates very good quality, and item 3 was recoded so that high (5) indicates very successful. The Cronbach's alpha (based on standardized items) for the decision making measure was .70.

Organizational rating was assessed with one item, following the same lead stem as used for the measurement of structure, processes, and flexibility. The wording of the item was “rate this organization compared to what you are used to?”. The response choices were *much poorer* (1), *somewhat poorer* (2), *no difference* (3), *somewhat better* (4), and *much better* (5).

Results

To examine the relationships between the variables, a correlational analysis was conducted (Table 2). The assumptions of linearity, univariate and multivariate normality necessary for more advanced analyses were evaluated, indicating that all measures had acceptable values. However, alignment was found to be only marginally acceptable in terms of normality, being somewhat negatively skewed (-1.077).

[Insert Table 2 about here]

Path analysis: Structural equation modeling

The hypothesized relationships between the variables (model 1, Figure 1) was tested in a path analysis using structural equation modeling (SEM) conducted in AMOS 16.0 (maximum likelihood estimation). To test the moderating effects of alignment, the alignment, structure and processes variables were first mean centered, after which two interaction terms were calculated.

The results demonstrated that the overall fit of model 1 was satisfactory; the chi-square-to-degrees of freedom ratio was below 2 ($\chi^2/df = 40.9/29$), the Comparative Fit Index (CFI = .985) was above the accepted criteria of .95 (Hu & Bentler, 1999), and the Root Mean Square

Error of Approximation (RMSEA = .043) was below the limit of .05 for a close fit (Browne & Cudeck, 1993).

No interaction effects were evident; all paths originating from the two interaction terms were near zero and nonsignificant. This finding suggested post hoc modifications to develop a more parsimonious model. The interaction terms were thus removed. Because it is suitable for comparing nonnested models (Tabachnick & Fidell, 2007), the Akaike Information Criterion (AIC) was used to compare the model without the interaction terms (model 2) with the hypothesized model (model 1). The AIC indicated that model 2 was better fitting and more parsimonious than model 1 (i.e., AIC dropped from 162.875 to 117.193). The other model fit measures (CFI = .976, RMSEA = .045) were virtually unchanged.

To refine model 2 further, the remaining nonsignificant paths were removed. When all nonsignificant paths had been removed, a final χ^2 difference test was conducted to compare this final model with model 2. The test did not indicate any significant deterioration of the model, $\chi^2_{diff}(8) = 2.373, p = .967$. On the contrary, the other fit measures (CFI = .989, RMSEA = .026, AIC = 103.6) demonstrated that the final model was both better fitting and more parsimonious than its predecessor. Because post hoc modifications were performed, a correlation was calculated between the hypothesized model (model 1) parameter estimates and the final model parameter estimates. Results indicated that the parameter estimates were practically unaffected despite modifications of the model, $r = .999, p < .001$.

[Insert Figure 2 about here]

The final model (Figure 2) shows that flat organizational structure influences effectiveness positively, as measured by information sharing, decision making, and organizational rating. Only one direct effect of flat structure was observed (on decision making),

with most effects mediated by flexibility. These results denote partial support for Hypotheses 1 and 3. The model further indicates that the effects of decentralized processes on effectiveness are positive and fully mediated by flexibility. This finding partially supports Hypotheses 2 and 3. In turn, the effectiveness measures were also found to be interrelated; the analysis demonstrated partial mediation by information sharing of the effects on decision making and organizational rating. Finally, the model shows that alignment has a positive effect on one of the effectiveness measures; that is, on organizational rating. No support was found for any other effects of alignment. These latter findings offer limited support to Hypothesis 4.

Cross-validation of the final path model

As the study's three sub-samples (studies 1, 2, and 3) originated from three different organizational settings, multiple-group SEM was used to examine whether the final path model was generalizable across the sub-samples. Cross-validity of the final path model was tested by comparing the fit of a constrained model (meaning that all factor loadings, path coefficients, and the one covariance was set to be identical in all of the three sub-samples) with an unconstrained model (i.e., a model where all of the these parameter values could vary freely within the three samples). The results showed no significant difference between the two models [$\chi^2_{diff}(24) = 29.5, p = .20$]. A nonsignificant difference in χ^2 value between these two models indicates that the parameter values displayed in Figure 2 are generalizable across the three sub-samples (e.g., Tabachnick & Fidell, 2007). The same procedure also showed no significant difference between civilian personnel (19% of the total sample) and military personnel [$\chi^2_{diff}(16) = 15.9, p = .60$]. These results suggested that the final path model was generalizable across the three organizational settings, as well as across the civilian-military divide.

Discussion

The purpose of the present study was to research the effects of central network organizational variables in military contexts. The results of the SEM analyses supported the propositions that flat organizational structure and decentralized processes have positive effects on both flexibility and effectiveness (effectiveness measured by information sharing, decision making, and organizational rating). The links to effectiveness were, however, almost fully mediated by flexibility; there was found only one direct effect; that is, of structure on decision making. Hence, there was found very little support for the proposed direct effects of structure and processes. The results provided only limited support for the proposition that alignment has both moderator and direct effects. Moreover, the degree of alignment between structure and processes was found to have a significant effect on organizational rating only. No support was found for the proposed moderating effects of alignment. As the literature suggested (e.g., Dennis, 1996), the effectiveness measures were also found to be interrelated.

Theoretical and practical implications

The finding of flexibility and information sharing mediating the effects of flat structure and decentralized processes, provide empirical evidence of the purported centrality of both flexibility and information sharing in the network organization literature (e.g., Alberts & Hayes, 2003). In fact, because there were found less direct effects than expected, the centrality of flexibility in the present results are understood to be even stronger than anticipated from the network literature. The present results also contribute to research beyond network theory by adding empirical evidence from military organizational contexts to the literature on both the structure and flexibility and the processes and flexibility links (e.g., Hatum & Pettigrew, 2006; Volberda, 1998; Zammuto & Krakower, 1991). Because the empirical evidence was equivocal

pertaining to the processes-flexibility link (e.g., Hatum & Pettigrew, 2006; Zammuto & Krakower, 1991), the present results also serve to clarify this link in relation to military contexts.

The current results propose that military, traditionally bureaucratic organizations, may benefit from flatter hierarchy and more decentralization in order to reach their goal of increased flexibility and effectiveness – quite in line with network theories (e.g., Alberts & Hayes, 2003; Snow et al., 1992). The present work thus brings the theoretical foundation of network theories further towards implementation in military organizations as empirical material on these propositions of network theories largely have been missing.

However, military organizations are not the only organizations that have maintained a bureaucratic organizational type. Indeed, after a long period of forecasting as well as describing the demise of the bureaucratic organization (e.g., Tiernan et al., 2002), recent empirical research has started to gather evidence for the persistence of bureaucratic organization (e.g., Graetz & Smith, 2007; Walton, 2005). Simultaneously, there have emerged advocates for more hybrid forms of organization, which ideally maintains the stabilizing effects of a traditional organization while also implementing changes to achieve the dynamism of the network organization (e.g., Graetz & Smith, 2007; Volberda, 1998). However, little is known as to what may be the optimal blend of traditional bureaucratic and newer network organizational characteristics. In fact, hybrid forms of organization may be conceived to involve a great risk of misalignment; rather than combining the advantages of the two organizational archetypes, a hybrid form could potentially promote the disadvantages of both. The present research used theories of organizational alignment (e.g., Galbraith, 2002; Kotter, 1978) to develop an understanding of a need for alignment between central network organizational variables in order to realize their expected potential. The results, however, provided only limited support for the proposition that

organizational structures and processes need to be aligned for the organization to be efficient. The shortcomings may be explained by a lack of misalignment issues in the data studied. On closer inspection, the alignment variable revealed a very high mean (4.21), indicating that the respondents' perceptions of the organizational structure and processes were well aligned. The results nevertheless supported the proposition that flatter structure and decentralized processes provide increased flexibility and effectiveness in organizations where the structure and processes are well-aligned. Interpreted alongside past theory and research (Galbraith, 2002; Kotter, 1978; Kvande, 2007; Vego, 2003), the present findings may still be understood to advocate an awareness of the internal alignment of organizational components in organizational change implementation. Adding a focus on the alignment of focal organizational components in future studies could also help researchers to better discern which organizational solutions are superior, thereby lessening the conflicting findings not uncommon to the literature on organizational variables (e.g., Hatum & Pettigrew, 2006; Richardson, Vandenberg, Blum, & Roman, 2002; Zammuto & Krakower, 1991). Indeed, it may be that the findings of Hatum and Pettigrew (2006) were contrary to those of Zammuto & Krakower (1991) and network theory in general, due to an alignment issue. The shortcomings described in the present study nevertheless indicate a need to study the effects of alignment further in future research.

Limitations and future directions

Caution is advised regarding the interpretation that decentralization, flat structure, and alignment *predict* information sharing, decision making, and organizational rating. Because the present study relies on cross-sectional data, the relationships found are not necessarily causal relationships. The research on which this study is founded nevertheless advocates such an interpretation (e.g., Alberts & Hayes, 2003; Volberda, 1998; Zammuto & Krakower, 1991).

Having employed several single-item measures in this study may be considered a weakness (e.g., Gosling, Rentfrow, & Swann, 2003). However, the focus on perceptions of organizational attributes rather than on underlying psychological constructs should allow for short, straightforward measurements (e.g., Rossiter, 2002), which have the advantage of minimizing item redundancy, time for completion, and participant fatigue (Gardner, Cummings, Dunham, & Pierce, 1998). These were all important concerns in the present study, as the items were part of a larger survey battery and the respondents were under considerable task pressure during the exercises. Wanous, Reichers, and Hudy (1997) successfully tested and employed a single-item measure of job satisfaction, demonstrating that the use of single-item measures should not be considered a fatal flaw. However, future research may consider more comprehensive measures where this is feasible.

The results of this study are based on participants' perceptions rather than on direct organizational measures, in line with the research on which this study was based (e.g., Campion et al., 1993; Zammuto & Krakower, 1991). Employing participants' subjective perceptions to make inferences about an organization's characteristics is often considered the most relevant approach in organizational studies (Patterson et al., 2005; Spector, 1994); the collective reality of an organization may be understood as the sum of the realities perceived by its participants (e.g., Patterson et al., 2005). There is, however, a debate about levels of analysis in organizational research (e.g., Schnake & Dumler, 2003). To address concerns regarding the individual level of analysis, the organizational items (independent variables) were phrased so that each individual evaluation was explicitly relative to the respondent's normal organizational setting. The analysis of the predictive value of these variables thus becomes relative to the functioning of many organizations rather than simply reflecting individuals' perceptions of the organizations in which

they presently are involved. This approach additionally proposes that the findings may be understood at an organizational level. To further test the robustness of the current findings, it may be useful to employ experimental manipulations and direct objective measures at both individual and organizational levels of analysis in future research.

Conclusion

The results suggested that flatter structures and more decentralized processes may provide greater effectiveness in military organizations. The data furthermore supported the centrality of flexibility portrayed in the network literature; flexibility was found to almost fully mediate the effects of structure and processes on effectiveness. Because structures and processes were found to be relatively well aligned in the organizations studied, results could not reveal the effect of misalignment, suggesting further research would be needed to establish this. Overall, the present results contribute to the advancements of network organizational theory from more than just a theory in military organizational contexts.

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Tables

Table 1. Study Characteristics and Participant Demographics Overview.

	<i>Study 1: AW04</i>	<i>Study 2: BG05</i>	<i>Study 3: MNE4</i>
<i>N</i> total / corrected for missing values	28 / 25	55 / 53	156 / 142
Military hierarchical level	HQ	Tactical	HQ
Exercise duration	Two weeks	Two weeks	Three weeks
Data collection site	Verona, Italy	Steinkjer, Norway	Distributed ^a
Services represented in sample	Joint	Army	Joint
Composition	Multinational	National	Multinational
Number of nationalities in sample	8 ^b	2 ^c	9 ^d
% Response rate	100 ^e	60	84
% Military / civilian	96 / 4	100 / 0	71 / 29
NATO rank			
% Officers: OF 1-10 (1-2 / 3-5 / 6-9) ^f	82 (-)	94 (77 / 17 / 0)	98 (21 / 73 / 4)
% Warrant officers: WO 1-5 ^f	0	0	2
% Other ranks: OR 1-9 ^f	18	6	0
% Male / Female	82 / 18	91 / 9	95 / 5
Years of military service: mean / <i>SD</i>	18.8 / 10.0	10.4 / 6.7	-

Notes. ^a The MNE4 was a distributed exercise conducted from participating nations (Canada, Finland, France, Germany, Sweden, the UK, and the US) and the NATO HQ in Turkey. Data were collected at the different sites.

^b Denmark (1), Germany (2), Greece (3), Hungary (2), Italy (1), Turkey (1), the UK (8), and the USA (10).

^c Netherlands (2), Norway (53). ^d Canada (21), Denmark (23), Finland (7), France (13), Germany (6), Sweden (8),

Turkey (23), the UK (12), and the US (43). ^e Participants came at will to researchers' office to fill in questionnaires, hence the 100% response rate (representing 31% of the DJTF personnel total). ^f % is calculated from military part of sample.

Joint = all services (Army, Navy, and Air force). Missing information is denoted by a dash (-).

Table 2. Means, Standard Deviations, and Zero-Order Correlation Coefficients.

	Mean	SD	1	2	3	4	5	6	7	8	9
1. Structure (hierarchy/ flat)	3.13	1.11									
2. Processes (centralized/decentralized)	3.08	1.14	.399***								
3. Alignment (1 & 2)	4.21	0.93	-.110	.117							
4. Flexibility	3.03	1.13	.371***	.408***	.046						
5. Organization rating	2.95	1.03	.157*	.202**	.182**	.518***					
6. Information amount	2.31	0.70	-.016	-.004	.067	.224**	.294***				
7. Information contentment	3.16	0.95	.123	.106	.029	.266***	.389***	.499***			
8. Decision timeliness	2.46	0.68	.085	-.037	-.060	.147*	.151*	.202**	.189**		
9. Decision quality	3.72	0.81	.244***	.090	.030	.255***	.313***	.181**	.302***	.348***	
10. Decision success	3.99	0.83	.123	.045	.010	.129	.233**	.202**	.252***	.329***	.630***

Notes. High scores indicate flat structure (FS), decentralized processes (DP), high alignment (A), high flexibility (F), high organizational rating (OR), appropriate amount of information (information sharing, IS, item 1), high contentment with information (IS item 2), high decision timeliness (decision making, DM, item 1), high decision quality (DM item 2), and high decision success (DM item 3). All variables have a scale from 1-5, except information sharing item 1 and decision making item 1, which both have 3-point scales.

* $p < .05$. ** $p < .01$. *** $p < .001$. $N=220$.

Figures

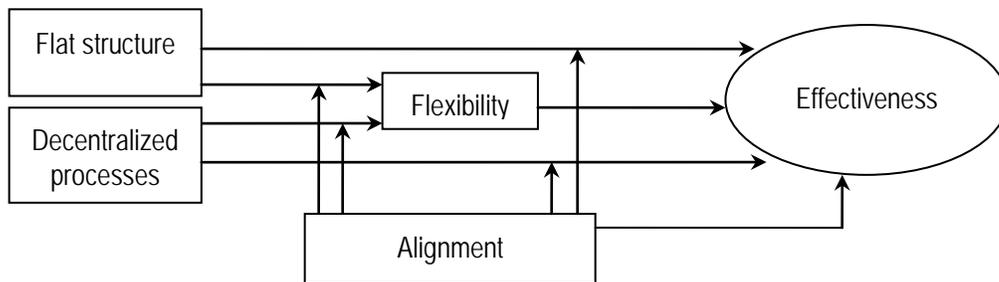


Figure 1. Conceptual model.

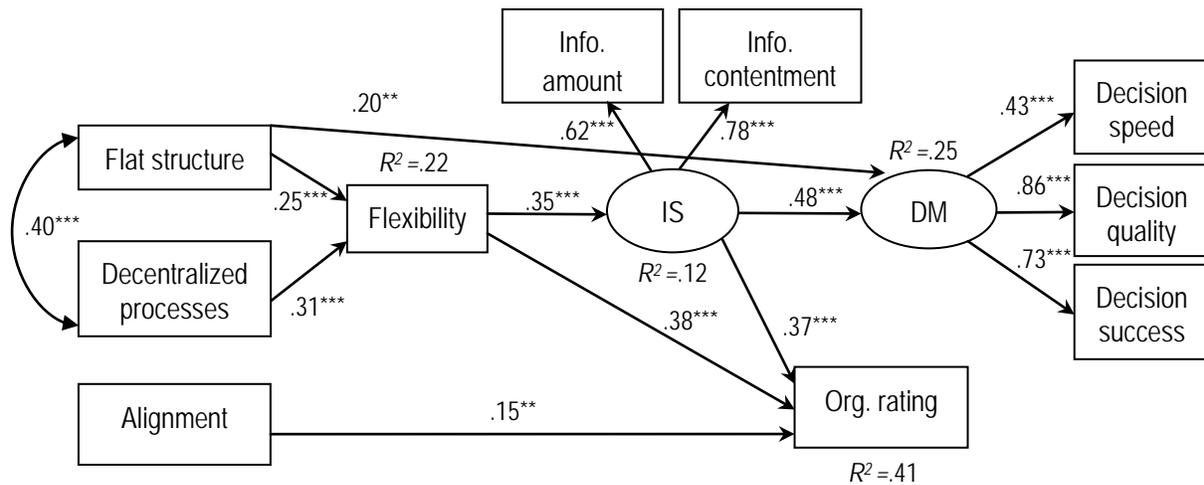


Figure 2. Final model representing the relationships between the variables (structure, processes, alignment, flexibility, information sharing [IS], decision making [DM], and organizational rating; standardized coefficients). * $p < .05$. ** $p < .01$. *** $p < .001$. $N = 220$.