

Organizational change capacity and composition of management teams: A visualization of how personality traits may restrain team adaptability

Jan Ketil Arnulf

BI Norwegian Business School

This is the author's final, accepted and refereed manuscript to the article published in

Team Performance Management, Vol 18, No.7/8, 2012, pp. 433-454

DOI 10.1108/13527591211281156

According to the copyright policy of the publisher *Emerald Group Publishing Ltd*, the authors retain the right to publish the final author version of their article in the institutional repository of their university.

Organizational change capacity and composition of management teams: A visualization of how personality traits may restrain team adaptability.

Abstract

This study explores ten management teams over 33 monthly financial reporting terms and a critical incident requiring readjustment of business. Using financial data, market information and personality data, it is shown that scale content and previously used measures such as intra-team means and variance are of little value in explaining performance. Instead, the presence of all strong traits in the form of maximum values has a tendency to push the teams toward stereotypical business behaviors, restricting adaptation in times of crisis. The exceptions are emotional stability and cognitive ability which support adaptation in a way corresponding to Belbin's original model. This study argues that the content of the actual traits may be less important to adaptation than a rigidity stemming from the tendency of personality traits to stay constant across contexts, possibly influencing situational adaptability. An alternative to the process loss mechanism traditionally attributed to heterogeneity is suggested. Theoretical and practical implications are discussed.

Introduction

May strong personality traits impose some sort of rigidity on management teams that prevents them from adapting their business in turbulent times? The ability to detect and adapt to a changing environment is a recurring topic in team research, but this subject is still insufficiently understood, particularly in non-laboratory teams (DeRue, Hollenbeck, Johnson, Ilgen, & Jundt, 2008; LePine, 2003; LePine 2005; Lepine, Piccolo, Jackson, Mathieu, & Saul, 2008; West, 1996) Previous research by LePine (LePine 2005) has suggested that personality composition of the team and the temporal sequence of changes may influence the adaptability of teams in laboratory groups, but according to a recent recent review of LePine & al. (LePine, Buckman, Crawford, & Methot, 2011), “findings from research on the relationship between team member personality and team effectiveness have not accumulated in a manner that is easy to decipher” (p. 312). Writers also call for more studies to provide evidence-based practical implications for management teams (O'Neill, Goffin, & Gellatly, 2012). The present study follows a group of management teams through three years of business operations and assesses how the presence of strong personality traits may have impacted their profitability as the market went through a profound crisis. The research question is how patterns of personality may be conceptualized and linked to indicators of adaptability in real, long term management teams, relating these patterns to financial performance and profitability.

The study contributes to the understanding of personality and management team performance in times of transition with clear relevance to business objectives as cross-disciplinary research is called for in management research (Devinney & Siegel, 2012), and the research on personality in teams and leadership has been criticized for being too general and abstract to be of practical value to management (e.g., Mohrman & Lawler, 2012; Pearce, 2004).

Personality composition in teams

Most participants in management teams have a feeling that the personality composition of the team matters, even though the research evidence is somewhat mixed. In contrast to the development of personality measures on an individual level in recent decades, viable approaches to the measurement and exploration of personality in teams has proven elusive for years, contrasting the recent decades in assessment on individual level (Halfhill, Sundstrom, Lahner, Calderone, & Nielsen, 2005; Heslin, 1964; LePine, et al., 2011) A pioneer on management team composition, Belbin (e.g., 1981) showed that various blends of personality traits have varying impacts on team performance, and especially warned against topping a team on intelligence. However, even though later research supports the destructive effect of certain personality compositions in teams (Duffy, Shaw, Scott, & Tepper, 2006), the clear-cut typology of personality and team functions proposed by Belbin turned out to be psychometrically untenable (Mottram, 2002). Later research has continued to find significant but mutually conflicting relationships between group personality composition and

performance (Halfhill, et al., 2005), as effects seem to vary with contexts, measurements and research designs. So far, there is only limited knowledge about the way personality factors contribute to team performance in general and to management teams in particular (Barrick, Stewart, Neubert, & Mount, 1998; Bowers, Pharmer, & Salas, 2000; Mathieu, Maynard, Rapp, & Gilson, 2008; Neumann & Wright, 1999; Peterson, Smith, Martorana, & Owens, 2003), and recent meta-analyses indicate that real teams have much stronger effects of personality than in laboratory settings even though a substantial part of this research is carried out in laboratories with so-called zero-history groups (Frey, 1996; LePine, et al., 2011).

The way personalities may effect interaction in teams has been measured in many different ways – average, minimum and maximum, variance, depending on whether teams should be heterogeneous or homogeneous, and in which particular constellation (Barrick, et al., 1998; Bell, 2007; Halfhill, et al., 2005; LePine, et al., 2011). West and co-workers (1998), in a review of research on team effectiveness, conclude that the question of heterogeneity of teams has been thoroughly discussed, but not well documented. The general findings have been that heterogeneity makes management teams more creative and adaptive in the long run, but on the cost of process loss (e.g., Hambrick, Seung Cho, & Chen, 1996; Mathieu, et al., 2008; Sparrow, 1994). Argote & McGrath (1993) argue that task demands decide whether hetero- or homogeneity in member characteristics is beneficial to teams. Barry & Stewart (1997) hypothesized that crucial traits such as extroversion should be differentially distributed within teams. West (1998) claims that some traits such as intellectual capability should be as high as possible for

all members, but Belbin (Belbin, 1981) cautioned against such ‘topped’ teams.

The concepts describing team process and performance have also developed into a multitude of possible ways of investigating team performance (e.g., Lepine, et al., 2008; Salas & Fiore, 2004). The effectiveness of team composition varies across team contexts (Mathieu, et al., 2008), and success criteria are neither obvious nor universally comparable across settings (March & Sutton, 1997). Task specificity may reduce the measurable effects of personality in large samples aggregated across professions and functions (Tett & Burnett, 2003). Recent advances in team research has also made it more difficult to determine the differences between input, process and output variables in research (Antoni & Hertel, 2009; Day, Gronn, & Salas, 2006; Ilgen, Hollenbeck, Johnson, & Jundt, 2005), and LePine & al.’s recent review (LePine, et al., 2011) concludes that there still are conceptual and methodological gaps in our understanding of this area.

In short, while the personality composition seems to affect existing work teams in general and of management teams in particular, there are still many questions about how personality composition can be conceptualized to explain all the effects on team performance. I have not found previous studies that examine how strong personality traits in teams can contribute to a perseverant rigidity with negative effects on adaptation to a changing environment, and there also does not seem to exist an empirical framework that conceptualizes this.

The role of management teams in organizational adaptation

Ever since Hambrick's seminal study on "top echelons" (Hambrick, 2007; Hambrick, et al., 1996), management teams have been shown to be important to organizational change (Beer & Eisenstadt, 1999; Edmondson, Roberto, & Watkins, 2003). Since tasks and contexts may influence how personality relates to management teams, more differentiated research is needed to investigate the interplay between various aspects of personality characteristics, team processes and organizational change. There is little research on team composition as antecedent to team adaptation processes (LePine, 2003; LePine 2005) or on how team personality composition intervenes in team processes (Bowers, et al., 2000).

In a study of team adaptability, LePine (2003) noted that team performance is a multi-dimensional construct, and that personality may be important in predicting some dimensions, but not others. Aspects of personality such as general mental ability may be more involved in adaptation of group processes than in the direct task solution. This is called "role structure adaptation" and is defined (p. 28) as "*reactive and nonscripted adjustments to a team's system of member roles that contribute to team effectiveness.*"

In a similar way, West (2002, p. 4) has defined the term 'team task reflexivity' as "... the extent to which team members collectively reflect upon the team's objectives, strategies and processes, as well as their wider organizations and environments, and adapt them accordingly. There are

three central elements to the concept of reflexivity ... – reflection, planning and adaptation.”

Interestingly, West describes ‘non-reflexivity’ as “...the state of acting ... without the awareness of the action. The team is not aware of doing, just doing”. This is in some ways a parallel to the definition of personality traits as “...a disposition or tendency to behave in a relatively consistent manner over time and across diverse situations” (James & Mazerolle, 2002, p.25), i.e., a relative preference of personal habits over situational demands. Weick & Roberts (1993, p.362) are explicit about this: “In heedful performance, the agent is still learning... Habitual performance is the outcome of drill and repetition.” LePine does not explicitly name this link, although he treats adaptation as a departure from routine (2003, p.27), which “has been characterized as mindless or heedless and thus has a high likelihood of being inappropriately applied in a changing situation.” This is exactly one of the defining properties of personality traits, a tendency to act in terms of internal dispositions instead of situational demands, as evident in the person-situation debate in psychology since the 1970s (DeYoung & Gray, 2009; Mischel, 1973; Mischel & Shoda, 1998; Zimbardo, 2008), and it is not included in the reviews and meta-analyses on personality and team processes undertaken by LePine and co-workers (LePine, et al., 2011; Lepine, et al., 2008).

An interesting implication of this link is the possibility that salient personality characteristics may be a threat to adaptation processes in teams,

not because of personal incompatibilities and process loss, but *because they impose limitations on the team's incitement to reflect*. In accordance with the theoretical views outlined above, the more pronounced any personality trait may be, the more it predicts a tendency to act on personal preferences instead of adapting to a situation. A "strong" personality trait implies having a high score on any tested trait. Management teams could be particularly vulnerable to this because of their responsibility for handling non-routine situations, *and so the presence of strong personality traits in management teams may be negatively related to organizational adaptation when needed*.

leading to hypothesis 1:

H1: The intra-team maximum scores on personality traits will be negatively related to the teams' organizational adaptation when needed.

Neuroticism and cognitive ability may be two exceptions to this pattern.

Neuroticism has been shown to be universally negative for leadership (Judge, Bono, Ilies, & Gerhardt, 2002), detrimental to teams (Duffy, et al., 2006) and Belbin (1981) claimed that psychologically stable members would always be an asset to management teams, leading to H2:

H2: The level of psychological stability in the team will be positively related to organizational adaptation when needed.

Intelligence plays a complex role in leadership. The impact on this trait on organizational effectiveness has been established as significant, but small, and lower in times of stress (Judge, Colbert, & Ilies, 2004). LePine (LePine 2005) found that cognitive ability resources in the team did predict

adaptation to unforeseen obstacles in laboratory teams, but not uniformly in all phases of adaptation. March (March, 1991) claims that uniformly high learning capacity in groups seems to hinder group level adaptation to shifting environments and suggests that “there might be some advantage to having a mix of fast and slow learners in an organization” (p. 76). This was central to Belbin’s claim that some intelligence is good but much can lead to barren disputes instead of action, leading to hypothesis 3:

H3: The standard deviation of reasoning ability in the team will be positively related to organizational adaptation when needed.

I am arguing that the maximum traits of personality in teams will pose a risk of rigidity. Some degree of reasoning ability and the total emotional stability will be beneficial to adaptation, but high scores on any other personality trait may contribute to habitual business behaviour. An empirical investigation of this requires measures of business performance, need for adaptation and a framework to link the presence of maximum team personality values to the need for business adaptation.

Method:

The case sample

The sample of this study consisted of ten management teams in charge of regional operating departments of a nation-wide wholesales company, dealing in equipment to professionals (business-to-business industry). The company was more than 100 years old, ranked among the 100 biggest in the

country, and was in a leading position in its line of business. This study spans 3 years of monthly financial performance and the need to adapt came at the beginning of the 3rd year, as their market crashed.

At the moment of study, no changes in organization or management team composition had taken place for 3 years. The employees in general and management in particular had served with the company for a long time and advanced to management positions there. Tenure averaged 14.7 years, age averaged 45 years and 8.2% were women.

The studied teams were structurally comparable. They were the mid-level management in the company, with only one level above them. The teams typically consisted of 5 – 7 members, with one regional manager, three sales managers, a warehouse manager and sometimes local department managers. Some of these managers had more than one function, depending on the size of the region.

All regional head managers had been in office during the last 3 years, with some minor exchanges at lower levels in the regions as exceptions to the rule of stability.

Differences between the regions are mostly due to differences in population and geographical size, which imply some minor differences in the composition of customers and products. The tasks of the teams remain the same.

Company culture favoured local solutions to the extent that all but one regional manager spoke the local dialect, and central regulations were few. It was therefore very much up to the local team to make plans, budget details, and to take necessary action to accomplish its goals. The main budgetary targets themselves in terms of total sales and profitability were however not locally determined, but imposed on the team from the national headquarter, using guidelines from the international corporate HQ. Generally each year's sales and profit targets were set by using the previous year's performance adding an equal percent as growth target for all regions. This caused some lamenting from the participants for being harsh, but also reduced the politics of negotiating upwards.

Formal education was not very high, ranging from those with high-school education to qualified engineers. However, many had taken courses in business administration at various levels. The managers knew their trade through practice whereas education played a minor role. Recruitment of new managers at different levels had been done locally and up to now, without formal requirements from HQ.

Their characteristics may be summarized as follows:

- The results of the teams were valid products of their own management, at least for the last 3 years – planning, execution, and follow-up.
- The 10 teams allow for valid between-teams comparisons in task, culture and organizational context.

- The effect of education and recruitment policies should not bias the effects of personality traits in management style and performance.
- The sample of management teams are what Shadish, Cook & Campbell (2002) call a purposive sample of typical instances, in this case fairly representative of real-life business management teams.

Measures of performance

The objective of local management was to sell as many goods as possible to the highest possible price (called the gross profit margin, GPM) and to the lowest possible cost. These three parameters are here used as part-goals, requiring less reflection and lending themselves more to habitual modes of business. Profitability could be reached by a balanced approach to sales, price negotiations and cost discipline. In practice, however, it is often tempting to achieve sales targets by lowering prices but this may hit profitability in the long run (Arnulf, 2005a).

All regions were evaluated monthly on their performance by these measures, all months being equal except for December. At this time of year, bonuses from suppliers and to certain customers were paid in a pattern obscure to most employees, even on a managerial level. Thus, being an invalid period for measuring local action taken on locally available information, December was omitted from this analysis.

The absolute financial figures differed between the regions due to different geographic sizes and populations within the regions. Comparability was

obtained by using percentage of budgetary targets on each measure each month. Percentages of fulfilment of budget targets on sales, gross profit margin and costs were used as indicators of part-goal achievement. These measures are then no longer directly linked to money, but rather to goal-setting (Locke & Latham, 1990), i.e., the degree to which the various teams have reached their different types of goals.

The final economic results were measured in Economic Value Added (EVA), a financial parameter comprising all usual budgetary information such as net operating results, but including cost of working capital. This is a conservative estimate of the profitability of a business unit frequently used for financial comparisons (Biddle, Bowen, & Wallace, 1999; Chen & Dodd, 2001). Regional EVA was the main budgetary goal for each region, computed and reported each month.

EVA in absolute numbers will also vary with the size of the regions due to differences in absolute business volume. To compensate for this when comparing teams, EVA was calculated in percentage of trade volume, also roughly equalling the basis for which bonuses were paid to the managers. Table 1 shows the correlations between financial targets in absolute volumes and their relative derivations as percentages of budgetary targets, number of employees and sales volume. The EVA in absolute numbers is highly correlated with the number of employees in the region, but this mainly reflects the population size in the regions served (e.g., big industrialized cities have larger sales volumes than sparsely populated rural areas). The

same table also shows that bigger regions tend to have lower profit margins due to increased regional competition and increased volumes. The absolute numbers therefore had to be replaced with relative measures allowing comparison between groups. The relative variations in sales and gross profit margins in percent of budgetary targets are roughly equal and EVA in percent of total sales volume can be seen as a derivative of operative performance. These measures are more influenced by the behavior of the teams than by irrelevant differences in their business environments. In practice, the teams may apply two different types of approaches: One is increasing sales by lowering the profit margins, hoping that volume may compensate for profitability but risking ruining their local markets in a downward spiral of price-sensitive competition. The other way is to keep up a high profit margin, making the most of other advantages to keep their position in the market but threatened by being perceived as too expensive by customers.

Thus, EVA in percent of sales volume is used as measure of profitability, while % budgetary achievement of sales and GPM are used as indicators of the degree to which the teams are pursuing volume or profitability as their main approaches to achieve profitability.

<Insert table 1 about here>

Need for adaptation

Impartial market surveillance data for every month throughout the years 2000, 2001 and 2002 are used. The financial uncertainties following the attack on the World Trade Center in New York on September 11th, 2001 had a marked negative impact on the market development. This market development is included in the monthly figures as a measure of the need for adaptation.

Personality tests and team characteristics

All team members were tested with Cattell's 16PF5 personality inventory. This test contains 16 personality scales labelled warmth, reasoning, emotional stability, liveliness, rule-consciousness, social boldness, sensitivity, vigilance, abstractedness, privateness, apprehension, openness to change, self-reliance, perfectionism and tension. In addition, the test contains a scale called "impression management" that is more often used as a control for a response bias towards social desirability. The 16PF5 version also allows these 16 scales to be combined in five global scales approaching the "big five", but here, the 16 individual scales.

The 16PF5 was chosen instead of a common five-factor test such as the NEO for four reasons: First, the 16PF5 contains a crude measure of cognitive ability which the NEO has not. Second, several teams had already used 16PF5 for local recruitment and this was considered less obtrusive. Several of the team members had already undergone a 16PF5-testing and the rest were tested throughout 2001. Third, this is the same test as used by Belbin in the 1980s. And, fourth, psychometric comparison shows that the

five global factors and psychometric properties of the 16PF5 are roughly comparable to the NEO so that research applying to one of these tests also applies to the other (Barbaranelli & Caprara, 1996; Rossier, de Stadelhofen, & Berthoud, 2004), as these two tests in fact share historical roots (H. E. P. Cattell, 1996). Since the point of interest in this study was to explore how any strong score (the tendency to act habitually) related to the teams' capacity for heedful vs habitual action in a changing market, all the 16 scales of the 16PF plus the "impression management" (IM, this scale is usually interpreted as the degree to which the target person's answers are biased towards social acceptability) scale were included in the analysis, but aggregated at team level. The following parameters were calculated:

- The mean intra-team value for every scale.
- The intra-team standard deviation for every scale.
- The maximum value for every scale.
- The sum of intra-team standard deviations as a measure of total heterogeneity.

Analysis and statistics

Performance was analysed from the monthly accountancy reports during the years 2000-2002, comprising 33 measuring points (months) on each parameter. The resulting data matrix for the 10 management teams consisted of 330 observation points, but the interdependence of these data restricted the possibility for multiple regression analysis and significance testing – while the financial data are new every month, the team profile remains the same throughout the whole period.

The study of personality composition of teams has been obstructed by a lack of appropriate methods and there is still room for exploration of new approaches that may capture the complexity of interaction between team members and team processes (LePine, et al., 2011). Instead of applying regular inference statistics, the statistical parameters were used for strictly descriptive purposes in an exploration of the proposed relationships for theory-generating purposes. This ideographic approach makes it possible to explore specific dynamic relationships that are otherwise reduced to noise in nomothetic approaches, as argued by Larsson, Bengtsson, Henriksson & Sparks (1998) concerning organizational learning projects and Cooke, Salas, Preston & Bell (2004) concerning team situational awareness analysis. The method may be vulnerable to sampling error, but the validity of the emerging patterns will be supported by substantial considerations and other qualitative information in a “thick description” (Geertz, 1973), resembling what Pigliucci (Pigliucci, 2002) calls “alternative hypothesis analysis”.

The emerging relations between quantitative variables are presented as patterns, visualized as plots. The personality variables are explored by entering them into a principal component analysis, specifying 2 factors. The emerging plot represents the mutual correlations of all the entered variables in 2-dimensional space. Similar to Cattell’s use of the scree-plot (R. B. Cattell, 1966), the objective here is to enable a visual inspection of a complex set of numerical relationships. This is a technique previously used

in research on genetics and language to show how the development of the human genome has paralleled the development of the major language families (Cavalli-Sforza, 2001). In the present study, the plot is used to create a visual comparison of the different business strategy approaches and personality traits. The ensuing result is a map representing the relationships of all the personality scales with sales achievement, GPM achievement, cost achievement and profitability (EVA%), respectively.

Factor analyzed separately, the 16PF5 dataset appears to render the 5 big five factors argued by Costa & McCrae (Costa & McCrae, 1992; Rossier, et al., 2004) and incorporated in the 16PF5, and the financial data will render roughly 4 factors – sales, profit margin, costs and EVA derivatives. Joining these variables in two-dimensional space suppresses these variations to 2 factors, still explaining more than 40% of the variance in financial and personality test data. This procedure filters out more complex relationships within the personality variables and the financial performance data, but keeps the focus of the present study: Are there patterns in relationships between personality profiles of teams and the teams' business-oriented behaviors? Rotating the factors does not play any role except for determining the axis direction. Oblimin rotation is used to yield the simplest plot and is most in accordance with recommendations on time series data (Coombs & Kao, 1960). The resulting picture will display how the entered personality variables related to the teams' preferred mode of business operations (pursuing sales volume or profit margins) and the effect on the obtained profitability.

All financial data were imported electronically from the company's accountancy system. The 16PF data were scored manually and entered in an electronic spreadsheet. All computations were made in SPSS.

Results

To establish a measure of the relative impact of sales and GPM budgetary achievement on profitability was calculated by regressing GPM and sales achievement of EVA in % of sales volume. The model is significant, the resulting adjusted R2 is .25, and it turns out that pursuing price margins is indeed a more profitable approach than pursuing volumes – the standardized beta for sales achievement is .27 while GPM achievement is .47. This tendency is in fact clearly visible even when EVA in absolute numbers are used as dependent variable instead, the beta for GPM-achievement is .36 but only .18 for sales achievement.

Further exploration showed that achieving sales over budgetary targets may actually result in negative EVA in a number of cases. This is less often the case with GPM-achievements above target, which makes GPM-achievement a much more profitable approach. This was not officially clear to the organization at this point, as it described itself as a “sales organization”, measuring and reporting sales 8 times per month and the GPM only once. This result is a prerequisite to the testing of the hypotheses, showing that personality traits may have different impact on business results through the way they relate to GPM or sales achievement.

The pattern of trade dynamics is then explored in absolute terms of pure money to show how the two-component plot creates vector lines for the financial targets (Fig. 3).

< Insert Figure 1 about here >

The resulting picture in figure 1 is to be expected from the theoretical relationship between the figures (explaining 85.6% of variance): Sales and costs are on the opposite sides of the same vector, as costs will always increase with the volumes traded. The GPM emerges on a nearly non-related vector (nearly 90 degrees on the trade-volume vector). Profitability (EVA) emerges as a symmetric product of sales, GPM and costs.

When substituting the figures representing money with figures representing budgetary achievement and relative profitability, a slightly different picture emerges. While figure 1 represents purely financial transactions, figure 2 represents the behavioural aspects of goal achievement that created the financial results. The financial dynamic is still visible, but figure 2 shows visibly how profitability correlated more closely with GPM achievement and possibly cost achievement than with sales achievement (explaining 66.8 % of the variance). This is in accordance with the regression equation above, and represents the tendency in the organization to focus on sales without attending sufficiently to the consequences.

< Insert Figure 2 about here >

The personality variables are now entered into the two-vector plot. Figure 3 shows the distribution of the intra-team standard deviations of all personality traits (explaining 41.0% of the variance). The two components are changed slightly. One factor is the dichotomy between sales and GPM achievement, where profitability appears more related to GPM and cost control than sales achievement. The other factor is caused by a distribution of personality scores, with no particular implication for business practices. Figure 3 is used as a contrast to the final hypothesis testing, since it shows that the intra-team standard deviations did not show up in any consistent relationship to sales and GPM achievement. A similar plot using the average values was also created, and the emerging picture showed the same random pattern.

Figure 4, however, renders a different picture (explaining 41.5% of the variance, the Eigenvalues of the two factors are 3.9 and 4.0, respectively).

< Insert Figure 3 about here >

< Insert Figure 4 about here >

In Figure 4, a striking symmetry appears. All maximum values except for those of emotional stability, reasoning and Liveliness were grouped on the

sales-achievement dimension of this component vector. Maximum emotional stability and reasoning were clustered on the opposite side, correlating positively with GPM achievement and profitability. The plotted position of 17 scales supports hypotheses 1 and 2, with only the liveliness scale remaining in an inconclusive position. The symmetry was improved when the maximum value of reasoning was substituted with the standard deviation. This supports hypothesis 3.

After the attacks on the World Trade Center in September 2001, the market deteriorated markedly, posing new demands on business. This can be seen in figure 5.

< Insert Figure 5 about here >

To see if the pattern in figure 6 was related to the challenges of market development during 2001, the model was subjected to a linear regression analysis as follows: A combined variable was computed as the sum of intra team maximum scores. This was entered together with the variables average emotional stability and the standard deviation of reasoning as predictors of EVA%. The analysis made use of all 330 observation points and separate values for the years 2000, 2001 and 2002 were computed. The resulting R^2 s, i.e., the correlations between the pattern in figure 4 and profitability, were taken as the explanatory value of the model. These were plotted against the market development in each of these years and displayed in figure 6. There is a leap in the explanatory value as challenges change for 2002, supporting

all the claim of all three hypotheses that these personality configurations are more beneficial during need for adaptation.

< Insert Figure 6 about here >

Discussion

This study was to follow management teams through three years of business operations and assesses how the presence of strong personality traits may have impacted their profitability as the market took a turn for the worse. Various hitherto common ways to aggregating personality measures on team level were explored ((Halfhill, et al., 2005).

The mean team values of personality scales did not seem to fall into any specific pattern. The intra-team variance seemed to offer more information, because the sum of intra-team standard deviations showed a strong negative correlation with profitability. This looked like an argument for the process-loss mechanism usually attributed to heterogeneity in teams.

A reason to doubt this mechanism comes from an inspection of the pattern of maximum scores. The most symmetrical pattern shows that all maximum scores are positively correlated with sales, with the exception of emotional stability (reversed neuroticism), reasoning and possibly liveliness. Thus, what seems like an issue of heterogeneity may in reality depend on the presence of extremes, which could point to another way of looking at personality in teams.

The usual theoretical interpretation of personality traits in team research may be called a content interpretation, i.e., viewing them as capacities or talents for behaviors denominated by the traits. From a content perspective, there is no obvious reason why the maximum values of all personality traits in a management team should be conducive to sales achievement. If, however, the score of any personality scale is seen as a form instead of content, increasing scores are indicating more stereotypical behavior at the expense of situational demands (Mischel & Shoda, 1998). This is the reason why I have chosen the plots instead of a regression analysis to explore the research question, allowing a visible demonstration that the maximum value of any personality trait except for the hypothesized two are grouping themselves around the habitual, sales-oriented approach. This is in accordance with LePine's findings in exploration teams (LePine 2005) which showed that a strong individual performance orientation was decidedly obstructive to group adaptation, possibly due to some kind of rigidity with resulting lack of alternative action strategies.

The resulting pattern symmetry here is in accordance with a heedless habit in many of the teams to pursue sales at any cost instead of adapting to more profitable business approaches (described in more detail in Arnulf, 2005b). It turned out that employees rated managers who excelled in sales achievement better and punished those who kept cost discipline and obtained good profit margins, leaving a zero correlation with the profitability of each manager's unit. It is as if all maximum scores are in line with this culturally developed sales-myopia.

The only exception to the rule was the maximum value of liveliness, which is most likely to be statistical noise. As argued in the hypotheses 2 and 3, it seems more reasonable that emotional stability and reasoning work in an opposite direction of the other traits, supporting heedfulness in business to avoid unprofitable transactions. This is in accordance with, LePine's (2003) model for the effect of mental ability on "heedless action", Weick & Robert's assertion (1993) that heedless performance suggests a failure of intelligence rather than knowledge, and West's (1998) description of team task reflexivity. It is also in accordance with meta-analyses of the impact of these two variables on job performance (Ree, Carretta, & Steindl, 2001) and on leadership (Judge, et al., 2004).

The beneficial effect to teams and leadership of emotional stability (or absence of neuroticism in FFM language) is widely documented (Duffy, et al., 2006; Joseph & Newman, 2010; Judge, et al., 2002). In an information-processing perspective, emotional stability may allow for considerate action with a lowered need for defensive thinking. Emotional stability is probably a one-dimensional scale because it is difficult to see benefits from neurotic functioning in management (see Duffy, et al., 2006; Peterson, et al., 2003). High emotional stability could create a facilitating environment for thinking unpleasant thoughts instead of acting heedlessly on threats.

The small, but noticeably improved picture using the standard deviation of reasoning instead of maximum or average is interesting in the light of various views on the value of cognitive ability to practical management in

recent decades. Belbin's original claim (Belbin, 1981) that so-called "A-teams" were vulnerable to futile discussions has met with similar claims from writers with a financial outlook, who claim that computability has limited value in dynamic business environments (Soros, 2006; Taleb, 2004), explored experimentally by March (March, 1991) and ecologically by Todd & Gigerenzer (Todd & Gigerenzer, 2003), and even remains elusive in leadership (Fiedler, 1967, 2002). The value of cognitive capacity in team adaptation seems more akin to Schön's concept "reflection-in-action" (Schön, 1983), as a capacity for continuous revision of actions but heeding the fact that action has priority above thinking (Dewey, 1958).

When splitting data up into the three years of the studied period, the intra-team variance in reasoning ability is more predictive for the years 2001 and 2002 than for 2000. During 2001, there occurred an unexpected drop in the market and all teams faced disconcerting prognosis. This is in accordance with LePine's (2003) finding that the effect of reasoning ability increases with the rising complexity of the task.

The model presented in figure 4 represents reasoning ability as a standard deviation instead of as a maximum. Not only does this create a more symmetrical picture, but is also in accordance with both Belbin's proposition (1981), that the reasoning ability in management teams was more potent when one or a few members had this ability, and that the

presence of many bright heads was a risk to smooth functioning, at least in the present setting.

In her 2003 presidential address to the Academy of Management, Jone L. Pearce (2004) complained about the limited value of academic research for practical management. Her example was that of an employee who had an extraordinary score on the much-cherished trait Conscientiousness, but was all the same a great challenge to management. The mechanism presented here might offer a reason for this: If cross-situational consistency is itself a risk to performance, a high score may impose a rigidity that could overshadow the talent conveyed by the trait in question. Such an effect would also contribute to the limited effect sizes observed for personality on various job tasks (Hurtz & Donovan, 2000), because the effects of personality could be inverted U-shapes.

In this way, this study contributes to the theoretical understanding of the complexity in which personality may affect the operations of management teams, affecting both cognitive and behavioural dimensions of team adaptation. The current way of using two-factor plots to display has been used in linguistics and genetics before (Cavalli-Sforza, 2001), but this is the first time it has been used in team research.

Practical implications

The ability to keep acting while reflecting critically has been described as central to adaptation in organizations in the learning traditions of Argyris and Schön (Argyris & Schön, 1996; Schön, 1983, 1987). Back to the days of the

Prussian general Clausewitz, writers on organization and leadership have warned against tendencies to rigid operations and “automatic” subordinates (Clausewitz, 1968; Creveld, 1985; Fallesen, 2000; Paret, 1985), leading to so-called “practical thinking programs” (Fallesen, 2000) to prevent habitual thinking. The findings in this study would support this tradition but also suggests that some people are more prone to become victims of habits than others. It suggests that selecting people with strong personality profiles may impose limits to adaptability, which could be of interest both in selection and in leadership development aiming for better self-awareness (London, 2002; Mazutis & Slawinski, 2008; O'Neill, et al., 2012)

Building competence in team reflection processes may be a more practical approach to improving team effectiveness than selection by personality tests. The most practical value of testing would then be to enhance self-awareness as a prerequisite of team process competence, which is in accordance with many approaches to leadership development (Conger & Toegel, 2003; Quirk & Fandt, 2000; West, 2002)

Limitations:

The measure of general mental ability (g) in this study is only the B scale in the 16PF5, which is probably not a very reliable measure of g. Also, this study builds on only 10 management teams, which imposes restrictions on statistical power and possibly renders the findings vulnerable to sampling error. The quantitative data are used for descriptive, theory-building purposes, and the arguments are based on the substantive coherences in the data patterns. However, the design is using 33 repeated measures for each

team comprising 330 observation points, and the restricted context allows a quasi-experimental control on contexts where effects of personality seem to be stronger than in laboratories (LePine, et al., 2011). Traditional fit indices like chi-square in e.g. SEM models are abstract and subject to much debate about their applicability and meaning (Diamantopoulos & Siguaw, 2000). The approach chosen here makes the fit directly observable to the reader as visual patterns akin to the use of Scree-plots to interpret factor analyses (R. B. Cattell, 1966). The advantage is the possibility to demonstrate dynamics that may drown in larger samples where aggregated data span across organizations and markets. Effects that need large samples to be detected are of questionable practical value to managers and consultants, widening the gap between ‘science’ and ‘profession’ (Schön, 1987; Van de Ven, 2000). 10 management teams performing for a time-span of 3 years is probably as large a sample as any practitioner may hope for.

Further research

Further research would have to bypass the problem of small samples and develop ways of more traditional significance testing but keeping the focus on the complex interplay of many traits. The challenge would be to include management teams from several cultural and task-specific environments. Such studies would have to identify the cultural and perceived task demands in accordance with each organization’s operating environment and culture.

REFERENCES

- Antoni, C., & Hertel, G. (2009). Team processes, their antecedents and consequences: Implications for different types of teamwork. *European Journal of Work & Organizational Psychology, 18*(3), 253-266.
- Argote, L., & McGrath, J. E. (1993). Group processes in organizations: Continuity and change *International Review of Industrial and Organizational Psychology* (Vol. 8). Chichester: Wiley.
- Argyris, C., & Schön, D. A. (1996). *Organizational learning II*. Reading, Mass.: Addison-Wesley.
- Arnulf, J. K. (2005a). The salesman's hangover: Unintended consequences of sales tactics. *Organisational Theory and Practice* (2), 39-47.
- Arnulf, J. K. (2005b). What's measured is not necessarily managed: Cognitive contingencies of organizational measurement. *Scandinavian Journal of Psychology, 46*(1), 59-68.
- Barbaranelli, C., & Caprara, G. V. (1996). How many dimensions to describe personality? A comparison of Cattell, Comrey, and the Big Five taxonomies of personality traits. [Article]. *European Review of Applied Psychology-Revue Europeenne De Psychologie Appliquee, 46*(1), 15-24.
- Barrick, M. R., Stewart, G. L., Neubert, M. J., & Mount, M. K. (1998). Relating member ability and personality to work-team processes and team effectiveness. *Journal of Applied Psychology, 83*(3), 377-391.
- Barry, B., & Stewart, G. L. (1997). Composition, process, and performance in self-managed groups: the role of personality. *Journal of Applied Psychology, 82*(1), 62-78.
- Beer, M., & Eisenstadt, R. (1999). *The silent killers: Overcoming the hidden barriers to organizational fitness* Harvard Business School.
- Belbin, R. M. (1981). *Management Teams. Why they succeed or fail*. Oxford: Butterworth & Heinemann.
- Bell, S. T. (2007). Deep-level composition variables as predictors of team performance: A meta-analysis. *Journal of Applied Psychology, 92*, 595-615.
- Biddle, G. C., Bowen, R. M., & Wallace, J. S. (1999). Evidence on EVA. *Journal of applied corporate finance, 12*(2), 69-79.
- Bowers, C. A., Pharmer, J. A., & Salas, E. (2000). When member homogeneity is needed in work teams. *Small group research, 31*(3), 305-327.
- Cattell, H. E. P. (1996). The original big five: A historical perspective. [Article]. *European Review of Applied Psychology-Revue Europeenne De Psychologie Appliquee, 46*(1), 5-14.
- Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research, 1*(2), 245-276.
- Cavalli-Sforza, L. L. (2001). *Genes, peoples, and languages*. London: Penguin Books.
- Chen, S., & Dodd, J. L. (2001). Operating income, residual income and EVA: Which metric is more value relevant? *Journal of managerial issues, 13*(Part 1), 65-86.
- Clausewitz, C. v. (1968). *On War*. London: Penguin Books.
- Conger, J. A., & Toegel, G. (2003). Action learning and multirater feedback: Pathways to leadership development? In S. E. Murphy & R. E. Riggio (Eds.), *The future of leadership development* (pp. 107-125). Mahwah, N.J.: Lawrence Erlbaum Associates.

- Cooke, N. J., Salas, E., Kiekel, P. A., & Bell, B. (2004). Advances in measuring team cognition. In S. E. & S. M. Fiore (Eds.), *Team Cognition: Understanding the factors that drive process and performance* (pp. 83-106). Washington, D.C.: American Psychological Association.
- Coombs, C. H., & Kao, R. C. (1960). On a connection between factor analysis and multidimensional unfolding. *Psychometrika*, 25, 219-231.
- Costa, P. T., Jr., & McCrae, R. R. (1992). Four ways five factors are basic. *Personality and individual differences*, 13, 653-665.
- Crevelde, M. v. (1985). *Command in War*. Cambridge Mass.: Harvard University Press.
- Day, D. V., Gronn, P., & Salas, E. (2006). Leadership in team-based organizations: On the threshold of a new era. *Leadership Quarterly*, 17(3), 211-216.
- DeRue, D. S., Hollenbeck, J. R., Johnson, M. D., Ilgen, D. R., & Jundt, D. K. (2008). How different team downsizing approaches influence team-level adaptation and performance". *Academy of management journal*, 51(1), 182-196.
- Devinney, T. M., & Siegel, D. S. (2012). Perspectives on the art and science of management scholarship. *Academy of Management Perspectives*, 26(1), 6-11.
- Dewey, J. (1958). *Experience and nature*. New York: Dover.
- DeYoung, C. G., & Gray, J. R. (2009). Personality neuroscience: explaining individual differences in affect, behavior and cognition. . In Corr PJ & G. Matthews (Eds.), *The Cambridge Handbook of Personality* (pp. 323-346). New York: Cambridge University Press.
- Diamantopoulos, A., & Siguaw, J. A. (2000). *Introducing Lisrel: a guide for the uninitiated*. Thousand oaks: Sage.
- Duffy, M. K., Shaw, J. D., Scott, K. L., & Tepper, B. J. (2006). The moderating roles of self-esteem and neuroticism in the relationship between group and individual undermining behavior. *Journal of Applied Psychology*, 91(5), 1066-1077.
- Edmondson, A. C., Roberto, M. A., & Watkins, M. D. (2003). A dynamic model of top management team effectiveness: managing unstructured task streams. *Leadership Quarterly*, 14(3), 297-325.
- Fallesen, J. J. (2000). Developing practical thinking for battle command. In C. McCann & R. Pigeau (Eds.), *The Human in Command: Exploring the Modern Military Experience*. New York: Kluwer Academic Plenum Publishers.
- Fiedler, F. E. (1967). *A theory of leadership effectiveness*. New York: McGraw-Hill.
- Fiedler, F. E. (2002). The curious role of cognitive resources in leadership. In R. E. Riggio, S. E. Murphy & F. J. Pirozzolo (Eds.), *Multiple intelligences and leadership* (pp. 91-104). Mahwah, NJ.: Erlbaum.
- Frey, L. (1996). Remembering and "re-membering": A history of theory and research on communication and group decision making. In R. Y. Hirokawa & M. S. Poole (Eds.), *Communication and group decision making* (pp. 19-54). Thousand Oaks: Sage.
- Geertz, C. (1973). *The interpretation of cultures*. New York: Basic Books.
- Halfhill, T., Sundstrom, E., Lahner, J., Calderone, W., & Nielsen, T. M. (2005). Group personality composition and group effectiveness: An integrative review of empirical research. *Small group research*, 36(1), 83-105.
- Hambrick, D. C. (2007). Upper echelons theory: an update *Academy of Management Review*, 32(2), 334-343.
- Hambrick, D. C., Seung Cho, T., & Chen, M.-J. (1996). The influence of top management team heterogeneity on firms' competitive moves. *Administrative Science Quarterly*, 41, 659-684.
- Heslin, R. (1964). Predicting group task effectiveness from member characteristics. *Psychological Bulletin*, 62, 248-256.

- Hurtz, G. M., & Donovan, J. J. (2000). Personality and job performance: The big five revisited. *Journal of Applied Psychology, 85*(6), 869-879.
- Ilgen, D. R., Hollenbeck, J. R., Johnson, M., & Jundt, D. (2005). Teams in organizations: From Input-Process-Output Models to IMOI Models *Annual Review of Psychology* (January).
- James, L. R., & Mazerolle, M. D. (2002). *Personality in work organizations*. Thousand Oaks: Sage.
- Joseph, D. L., & Newman, D. A. (2010). Emotional Intelligence: An Integrative Meta-Analysis and Cascading Model. [Review]. *Journal of Applied Psychology, 95*(1), 54-78.
- Judge, T. A., Bono, J. E., Ilies, R., & Gerhardt, M. W. (2002). Personality and leadership: A qualitative and quantitative review. *Journal of Applied Psychology, 87*(4), 765-780.
- Judge, T. A., Colbert, A. E., & Ilies, R. (2004). Intelligence and leadership: A quantitative review and test of theoretical propositions. *Journal of Applied Psychology, 89*(3), 542-552.
- Larsson, R., Bengtsson, L., Henriksson, K., & Sparks, J. (1998). The Interorganizational Learning Dilemma: Collective Knowledge Development in Strategic Alliances. *Organization Science, 9*(3), 285-305.
- LePine, J. A. (2003). Team adaptation and postchange performance: Effects of team composition in terms of members' cognitive ability and personality. *Journal of Applied Psychology, 88*(1), 27-39.
- LePine, J. A. (2005). Adaptation of Teams in Response to Unforeseen Change: Effects of Goal Difficulty and Team Composition in Terms of Cognitive Ability and Goal Orientation. *Journal of Applied Psychology, 90*(6), 1153-1167.
- LePine, J. A., Buckman, B. R., Crawford, E. R., & Methot, J. R. (2011). A review of research on personality in teams: Accounting for pathways spanning levels of theory and analysis. [Article]. *Human Resource Management Review, 21*(4), 311-330.
- Lepine, J. A., Piccolo, R. F., Jackson, C. L., Mathieu, J. E., & Saul, J. R. (2008). A meta-analysis of teamwork processes: tests of a multidimensional model and relationships with team effectiveness criteria. *Personnel Psychology, 61*(2), 273-307.
- Locke, E. A., & Latham, G. P. (1990). *A theory of goal setting and task performance*. New Jersey: Prentice Hall.
- London, M. (2002). *Leadership development: Paths to self-insight and professional growth*. Mahwah, N. J: Lawrence Earlbaum.
- March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science, 2*(1), 71-87.
- March, J. G., & Sutton, R. I. (1997). Organizational performance as a dependent variable. *Organization Science, 8*(6), 698-711.
- Mathieu, J., Maynard, M. T., Rapp, T., & Gilson, L. (2008). Team Effectiveness 1997-2007: A Review of Recent Advancements and a Glimpse Into the Future. *Journal of management, 34*(3), 410-476.
- Mazutis, D., & Slawinski, N. (2008). Leading organizational learning through authentic dialogue. *Management Learning, 39*(4), 437-456.
- Mischel, W. (1973). Toward a cognitive social learning reconceptualization of personality. *Psychological Review, 80*(4), 252-283.
- Mischel, W., & Shoda, Y. (1998). Reconciling processing dynamics and personality dispositions. *Annual Review of Psychology, 49*(1), 229.
- Mohrman, S. A., & Lawler, E. E. (2012). Generating knowledge that drives change. *Academy of management perspectives, 26*(1), 41.

- Mottram, R. (2002). Teamworking and the implications for individual development. In M. Pearn (Ed.), *Individual differences and development in organizations*. Chichester: John Wiley.
- Neumann, G. A., & Wright, J. (1999). Team effectiveness: Beyond skills and cognitive ability. *Journal of Applied Psychology*, 84(3), 376-389.
- O'Neill, T. A., Goffin, R. D., & Gellatly, I. R. (2012). The Knowledge, Skill, and Ability Requirements for Teamwork: Revisiting the Teamwork-KSA Test's validity. [Article]. *International Journal of Selection and Assessment*, 20(1), 36-52.
- Paret, P. (1985). *Clausewitz and the state : the man, his theories, and his times*. Princeton, N.J. : Princeton University Press.
- Pearce, J. L. (2004). What do we know and how do we really know it? *Academy of management review*, 29(2), 175-179.
- Peterson, R. S., Smith, D. B., Martorana, P. V., & Owens, P. D. (2003). The impact of chief executive officer personality on top management team dynamics: One mechanism by which leadership affects organizational performance. *Journal of Applied Psychology*, 88(5), 795-808.
- Pigliucci, M. (2002). Hypothesis testing and the nature of skeptical investigations. *Skeptical Inquirer*(November/December), 27-30.
- Quirk, M. P., & Fandt, P. M. (2000). *The 2nd language of leadership*. Mahwah, N.J.: Lawrence Erlbaum Associates.
- Ree, J. M., Carretta, T. R., & Steindl, J. R. (2001). Cognitive ability. In N. Anderson (Ed.), *Handbook of industrial, work and organizational psychology*. London: Sage.
- Rossier, J., de Stadelhofen, F. M., & Berthoud, S. (2004). The hierarchical structures of the NEO PI-R and the 16 PF 5. [Article]. *European Journal of Psychological Assessment*, 20(1), 27-38.
- Salas, E., & Fiore, S. M. (2004). Why team cognition? An overview. In E. Salas & S. M. Fiore (Eds.), *Team Cognition: Understanding the factors that drive process and performance* (pp. 3-8). Washington, D.C.: American Psychological Association.
- Schön, D. A. (1983). *The reflective practitioner: How professionals think in action*. New York: Basic Books.
- Schön, D. A. (1987). *Educating the reflective practitioner*. San Francisco: Jossey-Bass.
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Boston: Houghton Mifflin.
- Soros, G. (2006). *The age of fallibility: The consequences of the war on terror*. London: Weidenfeld & Nicolson.
- Sparrow, P. R. (1994). The psychology of strategic management: Emerging themes of diversity and cognition. *International Review of Industrial and Organizational Psychology*, 9, 147-181.
- Taleb, N. (2004). *Foiled by randomness : the hidden role of chance in life and in the markets* (2nd ed.). New York: Thomson/Texere.
- Tett, R. P., & Burnett, D. D. (2003). A personality trait-based interactionist model of job performance. *Journal of Applied Psychology*, 88(3), 500-517.
- Todd, P. M., & Gigerenzer, G. (2003). Bounding rationality to the world. *Journal of Economic Psychology*(24), 143-165.
- Van de Ven, A. H. (2000). Professional science for a professional school. In M. Beer & N. Nohria (Eds.), *Breaking the code of change*. Boston, Mass.: Harvard Business School Press.
- Weick, K. E., & Roberts, K. H. (1993). Collective Mind in Organizations - Heedful Interrelating on Flight Decks. *Administrative Science Quarterly*, 38(3), 357-381.

- West, M. A. (1996). Reflexivity, revolution and innovation in work teams. In M. M. Beyerlein, D. A. Johnson & S. T. Beyerlein (Eds.), *Advances in the interdisciplinary study of work teams: Product development teams* (pp. 1-29). Stanford, Connecticut: JAI Press.
- West, M. A. (2002). Reflexivity, revolution and innovation in work teams. In M. Beyerlein, D. A. Johnson & S. T. Beyerlein (Eds.), *Advances in the interdisciplinary study of work teams: Product development teams* (pp. 1-29). Stanford, Connecticut: JAI Press.
- West, M. A., Borrill, C. S., & Unsworth, K. L. (1998). Team effectiveness in organizations. *International Review of industrial and Organizational Psychology*, 13.
- Zimbardo, P. G. (2008). The Lucifer effect and the psychology of evil. [Meeting Abstract]. *International Journal of Psychology*, 43(3-4), 348-348.