The relationship between organizational culture and performance in acute hospitals

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A R T I C L E  I N F O

Article history:
Available online 2 November 2012

Keywords:
Organizational culture
Hospital performance
Competing Values Framework
English NHS hospital Trusts

JEL code:
I11
Z10

A B S T R A C T

This paper examines the relationship between senior management team culture and organizational performance in English acute hospitals (NHS Trusts) over three time periods between 2001/2002 and 2007/2008. We use a validated culture rating instrument, the Competing Values Framework, to measure senior management team culture. Organizational performance is assessed using a wide range of routinely collected indicators. We examine the associations between organizational culture and performance using ordered probit and multinomial logit models. We find that organizational culture varies across hospitals and over time, and this variation is at least in part associated in consistent and predictable ways with a variety of organizational characteristics and routine measures of performance. Moreover, hospitals are moving towards more competitive culture archetypes which mirror the current policy context, though with a stronger blend of cultures. The study provides evidence for a relationship between culture and performance in hospital settings.

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Introduction

Culture, with its many definitions and meanings, has always been hard to pin down (Braithwaite, Hyde, & Pope, 2010; Martin, 2002). Anthropological and sociological approaches tend to define culture as a set of attitudes, beliefs, customs, values and practices which are shared by a group (Alvesson, 2002; Ashkanasy, Wilderom, & Peterson, 2000). The group may be defined in terms of politics, geography, ethnicity, religion, or some other affiliation. The characteristics which define the group may be manifested in the form of signs, symbols, language, artefacts, oral and written tradition and other means (Brown, 1995). One of the critical functions of these manifestations of a group’s culture is to establish a distinctive identity and thereby provide a means by which members of the group can differentiate themselves from other groups (Throsby, 2003).

Culture, in this view, functions as a coordinating device (Schein, 1997). Cultural differences can be interpreted in terms of differences in the beliefs people hold about the way the world works and about one another, leading to the choice of one set of strategies rather than another and thereby, sustaining one set of institutions and technology rather than another (Greif, 1994). Institutions are therefore formed and held together by the beliefs members hold about one another and the world.

Sociologists and anthropologists (Richerson & Boyd, 2005) have accumulated a wealth of evidence on the impact of culture on economic behaviour. Many institutional economists emphasize both the links from culture to beliefs and values, and from beliefs and values to economic outcomes (Guiso, Sapienza, & Zingales, 2006). Culture has been found to influence both economic preferences (Fernández & Fogli, 2005) and political preferences, and affect economic outcomes through both these channels.

Within institutional economics there has been increasing focus on the role of organizational cultural factors in framing economic
decisions, shaping preferences and regulating behaviour (Hermalin, 2000; Jackson, 2009). The main foci of study are the ‘habits of use’ and ‘institutions’ that take together form the patterns of an organization’s culture. Here, institutions comprise the ‘rules of the game’ in a social collectivism or the ‘humanly devised constraints that shape human interaction and structure incentives in human exchange’ (North, 1990). Economic institutions can serve to reduce the inherent uncertainty associated with complex economic processes so that co-ordination between different actors is more likely to occur.

Institutional economic theory postulates that an organization’s core values help shape its members’ preference patterns and in doing so may affect economic decision-making and performance in a variety of ways (Carrillo & Gromb, 1999; Hodgson, 1996; Kreps, 1990; Smith, Männion, & Goddard, 2003).

First, culture may impact upon efficiency, via embedding shared values, beliefs and norms within the organization, which in turn help shape the ways in which organizational members interact and engage with each other. Specific cultural values may be more or less conducive to (for example): effective decision-making; reporting, responding to and learning from errors; team-based working; and inter-departmental synergies and creativity.

Second, culture may influence the priority accorded to equity considerations within organizational strategy, for example by promoting shared ethical principles of protecting vulnerable consumers, and establishing arrangements that correct for purely efficiency-seeking behaviour.

Third, culture may influence the overall economic and social objectives that an organization pursues. Thus, the corporate culture may be one of concern for employees and the quality of their working lives and such considerations may mitigate the importance of profit maximisation or other economic goals in the organization’s objective function.

Finally, where interaction and exchange between parties is complex and difficult to monitor, corporate culture may encourage co-operation and relationship building among agents (intra- and inter-organizational partnership working).

There have been a number of empirical studies that have sought to identify a relationship between organizational culture and organizational performance. Indeed a clutch of populist texts dating back to the 1980s proved influential in instilling the notion that ‘strong cultures’, defined as “a set of norms and values that are widely shared and strongly held throughout the organization” (O’Reilly & Chatman, 1996, p. 166), are related to high performance across a range of industries (Deal & Kennedy, 1982; Denison, 1990; Peters & Waterman, 1982). This hypothesis is based on the idea that organizations benefit from having highly motivated employees dedicated to common goals. Within the literature it is possible to identify several studies that have purported to show that ‘strong cultures’ outperform ‘weak cultures’ (Chatman & Cha, 2003) and evidence suggested that ‘strong’ corporate cultures improved organizational performance by facilitating internal behavioural consistency (Sørensen, 2002). This work had a normative aspect in as much as mechanisms for modifying the cultures of organizations to approximate those of successful ones were widely discussed and applied in an effort to improve performance (Barney, 1986). Later work has thrown considerable doubt on whether such a simplistic causal relationship exists (Gordon & Di Tomaso, 1992; Wilson, 1992).

A number of empirical studies have sought to identify culture-performance relationships in healthcare settings. For example studies have found associations between organizational culture and the implementation of quality systems in hospitals (Shortell et al., 1995), the quality of patient-care (Rondeau & Wag, 1998), attitudes to and satisfaction with the use of clinical information systems (Callen, Braithwaite, & Westbrook, 2007), effectiveness of provider teams and healthcare provider job satisfaction (Gifford, Zammuto, & Goodman, 2002; Goodman, Zammuto, & Gifford, 2001), outcomes of organizational structural change to clinical directorate service structures (Braithwaite et al., 2005), and patient satisfaction (Meterko, Mohr, & Young, 2004). Two studies of senior management team culture in hospitals in the UK and Canada found evidence to support a contingent relationship between dominant management cultures and a range of performance domains (Gerowitz, 1998; Gerowitz, Lemieux-Charles, Heginbothan, & Johnson, 1996). Another cross-section study of employees in Chinese public hospitals examined the relationship between organizational culture and hospital performance and found a similar contingent relationship where factors embedded in the culture (e.g. cost control) were associated with hospital performance (e.g. profitability) (Zhou, Bundorf, Chang, Huang, & Xue, 2011). Indeed, the authors have in an earlier study examined the relationship between organizational culture and performance in hospitals in a cross-section analysis (Davies, Männion, Jacobs, Powell, & Marshall, 2007). Again, no specific causal mechanism is postulated in these studies, but taken together they support the view that specific aspects of performance are enhanced in those cultures that have closely aligned values to the performance.

There has been a dearth of empirical evidence on the longitudinal aspects of culture change and the association with performance over time. The aim of this study is to extend the previous cross-section analysis (Davies et al., 2007) by looking at changes in senior management team culture in English NHS acute hospitals over three time periods between 2001/2002 and 2007/2008. We link this to various performance measures and key characteristics of healthcare organizations to examine the relationship between culture and performance to see if organizational values deemed important within a particular dominant culture coincide with those aspects of performance at which the organization excels over time.

We use an established culture assessment instrument, the Competing Values Framework (CVF) (Quinn & Rohrbaugh, 1981), which has previously been used to assess culture in a number of health and non healthcare settings (Gifford et al., 2002; Goodman et al., 2001; Helfrich, Li, Mohr, Meterko, & Sales, 2007; Jones, DeBaca, & Yarbrough, 1997; Meterko et al., 2004; Shortell et al., 2000, 2004; Strasser, Smits, Falconer, Herrin, & Bowen, 2002). The CVF (shown in Fig. 1) differentiates organizational culture across two dimensions. One dimension differentiates an emphasis on flexibility, discretion, and dynamism from an emphasis on stability, order, and control. For example, some organizations and managers are viewed as effective if they are changing, adaptable, and transformational. Other organizations and managers are viewed as effective if they are stable, predictable, and consistent. This continuum ranges from versatility and pliability on one end to steadiness and durability on the other. The second dimension differentiates an internal orientation with a focus on integration, collaboration, and unity from an external orientation with a focus on differentiation, competition, and rivalry. For example, some organizations and managers are viewed as effective if they have harmonious internal relationships and processes. Others are judged to be effective if they successfully compete against others. This continuum ranges from cohesion and consonance on the one end to separation and independence on the other.

Using these two main dimensions, the CVF articulates four basic organizational cultural types (Cameron & Freeman, 1991). The Clan culture identifies values that emphasize internal, organic focus (‘do things together’), whereas the Rational culture identifies values that emphasize external, control focus (‘do things fast’). The Developmental culture identifies values that emphasize external,
organic focus (‘do things first’) whereas the Hierarchical culture emphasizes internal, control values (‘do things right’).

Crucially, organizations (or subgroups within them) are not deemed to be simply one of these four types; instead, they are seen to have competing values while nonetheless having a more-or-less stronger pull to one particular quadrant.

We link data from the CVF culture rating instrument to a number of measures of performance at English acute hospitals over three time periods. We hypothesise that those aspects of performance valued within a given culture should be those aspects of performance that are enhanced in acute hospitals that exhibit strong congruence with that culture.

Thus an understanding of the values, beliefs and assumptions that underpin the CVF allowed a number of a priori hypotheses to be derived about relationships between culture and performance. These hypotheses are shown in Table 1 and are based on the key ‘competing values’ as set out in Fig. 1.

Star ratings, a composite performance indicator set by the NHS healthcare regulator, the Healthcare Commission, were used between 2000/2001 and 2004/2005 and were one of the most general overall performance ratings used for hospitals, a headline measure that had wide implications for that institution’s management and accountability arrangements, as well as its reputation (Jacobs, Martin, Goddard, Gravelle, & Smith, 2006; Mannion, Davies, & Marshall, 2005a). We specifically examine the relationship between hospital culture types and star ratings. We hypothesise that Clan cultures may have poorer star ratings and Rational and Developmental cultures may have better star ratings.

We also examine whether differences in culture types are associated with various structural and performance measures such as size of hospital, teaching, specialist, and Foundation Trust (FT) status. FT status is another marker for high performing organizations and is awarded to hospitals who meet certain criteria set by the Department of Health and the FT regulator Monitor. FTs enjoy greater financial and managerial autonomy from central control and became operational in 2004/2005. We hypothesise that specialist, teaching hospitals and FTs, like star ratings, may be associated with Rational and Developmental cultures with a greater external focus. Other hypothesised relationships for performance measures which we examine such as cost, daycase rates, salaries, cancelled operations and waiting times are all given in Table 1.

**Methods**

**Senior management sample**

Ethics approval for this project was obtained from the NHS National Research Ethics Committee. We examine senior management team culture in English NHS acute hospital Trusts (the legal entity for individual hospitals or groups of hospitals). Each hospital is headed by a board consisting of executive and non-executive directors who will have diverse roles including clinical and operational management. We conducted a national longitudinal study of board level managers encompassing three cross sectional surveys:

i) 2001/2002 (T1) with responses from 899 managers from 187 hospitals;

ii) 2006/2007 (T2) with responses from 826 managers from 143 hospitals;

iii) 2007/2008 (T3) with responses from 739 managers from 140 hospitals.

**Table 1**

<table>
<thead>
<tr>
<th>Dominant culture types</th>
<th>Valued aspects:</th>
<th>Expected performance variables favoured:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clan</td>
<td>Tradition, cohesion, commitment, morale</td>
<td>Smaller; better staffing levels, staff opinions/morale; higher degree of specialisation; higher level of cancelled operations; high levels of trust; however, may have poorer star ratings.</td>
</tr>
<tr>
<td></td>
<td>~ Internal/relational</td>
<td>Lower waiting times; better star ratings; more likely FTs; low level complaints, rapidly dealt with; lower clinical negligence; more imaging tests; more likely specialist; higher consultant and nurse salaries; higher daycase rates.</td>
</tr>
<tr>
<td>Developmental</td>
<td>Innovation, dynamism, growth, entrepreneurship</td>
<td>Better data quality and financial balance, but perhaps higher costs associated with bureaucracy; shorter length of stay.</td>
</tr>
<tr>
<td></td>
<td>~ External/relational</td>
<td>More research; more teaching; higher costs; better star ratings; more likely FTs; low level complaints, rapidly dealt with; higher management salaries.</td>
</tr>
<tr>
<td>Hierarchical</td>
<td>Order, procedures, stability, predictability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>~ Internal/mechanistic</td>
<td></td>
</tr>
<tr>
<td>Rational</td>
<td>External competitiveness, achievement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>~ External/mechanistic</td>
<td></td>
</tr>
</tbody>
</table>
The reduction in the number of hospitals in the sample over time is the result of hospital mergers over this period. While mergers and turnover of senior management teams may impact on culture (Kavanagh & Ashkanasy, 2006), we are unable to track individual respondents since they were anonymous. In addition, we do not know if the same managers were responding over time.

Previous studies have usually regarded three or four key senior managers’ responses as sufficient to validly describe the organizational culture type (Gerowitz, 1998; Gerowitz et al., 1996). At the first data gathering (T1) at least three senior managers responded from 86% of hospitals and four or more replied from 74%. Data from T2 and T3 were considerably better with 95% (from 143 hospitals in T2) and 93% (from 140 hospitals in T3) with at least three senior managers responding respectively, and 89% in both periods where four or more replied. This provides us with robust estimates of senior management views.

We tested for the appropriateness of aggregation of respondents’ scores within an organization using various established methods of assessing congruence (e.g. interclass-correlations, the F-test and Analysis of Variance (ANOVA) (Dixon & Cunningham, 2006)). We found acceptable levels of agreement.

A variable (weight) was created to take account of the number of respondents per organization. In some time periods for some organizations there were as many as 18 respondents, with the assumption that culture type derived from higher numbers of respondents provides a more robust assessment. This weight was used in regressions and with descriptive analyses, but was found in practice to have negligible effects and is therefore not presented.

Culture and performance measures

The CVF questionnaire offers respondents a series of descriptions of a hospital, arranged in five groups. Respondents have to ‘share 100 points’ for each group across four descriptions ‘according to which description best fits your current organization’ (copy available from the authors). The five groups are based on descriptions of hospital characteristics, leadership emphasis, cohesion and rewards. Taken together these ‘points allocations’ add up to a total score (in the range 0–100) for each individual on each of the four overall culture types, labelled Clan, Developmental, Hierarchical, or Rational. Thus, for instance, the Rational culture denotes a competitive and acquisitive organization, characterised by goal oriented leadership, bonded by an emphasis on winning (see Fig. 1).

The CVF uses the two main dimensions (internal versus external and relationship versus mechanistic processes) in order to generate the two-by-two matrix that classifies culture as a balance between the four cultural archetypes. The values denoted by CVF ‘compete’ in the sense that scores in one direction on an axis are allocated at the expense of scores in the other direction. Although they are made up of competing values they nevertheless have a more-or-less strong pull to one particular ‘dominant’ culture type.

The culture type with the highest score from a respondent represents that individual’s perception of the organization’s dominant culture; the actual value represents the ‘strength’ of that dominant culture type. Scores on each axis of the matrix, along with dominant culture type and strength were calculated by aggregating across the individual scores of the senior management team of each organization.

The concentration of scores within each culture typology was assessed using the Blau index of heterogeneity (which is one minus the Hirschman–Herfindahl index) (Shortell et al., 2004). This is calculated as $H = 1 - \sum p_i^2$, where $i$ is the number of categories possible (four) and $p$ is the proportion of points assigned to that culture type. Teams that apportioned points in a 25/25/25/25 pattern (a balanced culture) would receive the highest possible score on the Blau index of 0.75, whereas teams with all points concentrated in one culture (a wholly dominant culture) would receive the lowest score on the Blau index of 0.


Statistical analysis

We sought to examine the relationship between senior management team culture and star ratings. We did a descriptive analysis and supplemented this with an ordered probit model of hospital culture against star ratings (where 0-star hospitals are worst performers and 3-star hospitals are best performers). The model is described in the Appendix A.

The ordered probit model could only be run for T1, since star ratings were scrapped after 2004/2005. The star ratings were set by the Healthcare Commission and replaced by an annual health check (no longer a composite indicator).

We then sought to examine differences in culture type according to various other structural and performance variables, namely size, teaching, specialist, and Foundation Trust (FT) status. We used a dummy variable for teaching, specialist, and FT status. The number of teaching hospitals in each period was 24 (T1), 17 (T2) and 19 (T3), the number of specialist hospitals in each period was 20 (T1), 18 (T2) and 15 (T3), whilst the number of FTs was 0 (T1), 26 (T2) and 45 (T3). We created a dummy variable for size, with hospitals larger than the median average number of beds in any given period taking the value one and zero if smaller. The cut-off median bed sizes in each period were 667 (T1), 675 (T2) and 678 (T3) beds.

Finally, we modelled the differences in culture type using multinomial logit models with various structural and performance measures as explanatory variables. We were not able to combine the separate culture scores for each hospital into a single dependent variable for the model and therefore used dominant culture type as the dependent variable. This amounts to a loss of information since hospitals proportionally may belong to one culture type more than another, but not exclusively to only one. The culture scores are essentially jointly determined and constrained dependent variables. Nevertheless, the multinomial logit gives us a flavour of the competing values aspect of culture as represented by the nominal outcomes. It is also more powerful than looking at associations in isolation since it shows the significance of all performance variables simultaneously. We describe the multinomial logit in the Appendix A.

The model is run three times using different base categories as comparison groups in order to make all relevant contrasts across the four culture outcomes. Multinomial analysis across the three time periods was hampered for two reasons: first, mergers across the organizations effectively reduced the number of organizations in the sample and complicated the task of linking culture to performance at the same and different time points. Second, performance variables were not always measured (or measured, consistently) at each of the three time points so certain variables had to be discarded from the analysis. We therefore ran the model for the three time periods pooled since this provided the most
robust model. We tested a large number of hospital characteristics and performance variables including size, teaching, specialist and FT status, mergers, activity rates, staffing numbers, salaries, various measures of financial performance such as retained surplus, clinical negligence expenditure, waiting times, length of stay, other measures of efficiency, and regional dummy variables.

Results

Dominant culture

Fig. 2 summarises our findings in terms of the hospitals' dominant culture type as reported by senior managers at the three time points. Results were weighted by the number of respondents per organization, though this made little difference from unweighted scores. Over the five-year period between 2001/2002 and 2006/2007, Clan remained the most dominant type of senior management team culture (53% and 46% respectively), although its prevalence was in decline with a corresponding large rise in Hierarchical cultures from T1 (4%) to T2 (13%). Over the same period Rational cultures accounted for a roughly consistent proportion of hospitals (30% and 31% respectively). The proportion of Developmental cultures also remained relatively constant.

However, one year later in 2007/2008 Rational culture had overtaken Clan to become the most frequently reported dominant culture type (40% of hospitals; representing a 34% increase). These changes were matched by corresponding falls in the frequency of Clan as dominant culture to 39%; and, to a lesser extent, Developmental (down from 10% to 9%).

Organizations tended to have reasonably balanced culture types (a blend of cultures) rather than a wholly dominant culture as evidenced by the Blau index (Table 2) and indeed are becoming increasingly more so over time. In concordance with this result, the mean strength of the dominant culture also declined over the study period from 36.6 to 33.8. We test whether these changes are significant over time (t-test) and find that they are for the change between the first two periods, but not between the last two periods.

<table>
<thead>
<tr>
<th></th>
<th>Obs</th>
<th>Mean</th>
<th>Std. dev</th>
<th>Min</th>
<th>Max</th>
<th>t-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blau index</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2001/2002 (T1)</td>
<td>187</td>
<td>0.716</td>
<td>0.033</td>
<td>0.528</td>
<td>0.749</td>
<td></td>
</tr>
<tr>
<td>2006/2007 (T2)</td>
<td>143</td>
<td>0.727</td>
<td>0.019</td>
<td>0.602</td>
<td>0.749</td>
<td>0.000***</td>
</tr>
<tr>
<td>2007/2008 (T3)</td>
<td>140</td>
<td>0.729</td>
<td>0.019</td>
<td>0.495</td>
<td>0.749</td>
<td>0.188</td>
</tr>
<tr>
<td>Culture strength</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2001/2002 (T1)</td>
<td>187</td>
<td>36.6</td>
<td>6.11</td>
<td>27</td>
<td>64</td>
<td></td>
</tr>
<tr>
<td>2006/2007 (T2)</td>
<td>143</td>
<td>34.58</td>
<td>4.97</td>
<td>26</td>
<td>58</td>
<td>0.001***</td>
</tr>
<tr>
<td>2007/2008 (T3)</td>
<td>140</td>
<td>33.76</td>
<td>4.74</td>
<td>27</td>
<td>60</td>
<td>0.078*</td>
</tr>
</tbody>
</table>

*Significant at the 10% level; ***significant at the 1% level.

Culture and performance

The results for the descriptive analysis of culture type by composite star rating for period T1 are given in Fig. 3. This shows a slight positive gradient for Developmental cultures with lower proportions found in zero stars (worst performers) and higher proportions in three stars (best performers). There is also a slight negative gradient for Clan cultures revealing higher proportions in the zero star category and lower proportions in the three star category.

The ordered probit results in Table 3 support the descriptive findings and show that hospitals with Developmental cultures were associated with higher Star ratings (higher performance). The results are significant at the 1% level. It should be noted that these results suggest an association between performance and culture, but do not imply causality.

Disaggregating the dominant culture type by size (Fig. 4), teaching (Fig. 5), specialist (Fig. 6) and FT status (Fig. 7), suggests that larger hospitals tend to have more Developmental and Rational cultures with, not surprisingly, a high though declining proportion of small hospitals in the Clan category (54%). Teaching hospitals tend to be clustered in Rational cultures and declining in Hierarchical and Clan cultures. Specialist hospitals tend to be clustered in the Clan culture, though there has been a marked decline between T1 and T3 and a marked growth in the
Developmental culture. FTs (higher performers) tend to be clustered in the Clan and Rational cultures, though for both FTs and NFTs the trend is away from Clan and towards Rational cultures.

Multinomial logit model

In order to simultaneously model the various performance measures across the three time periods, we use the multinomial logit model and results are given in Table 4. Not all performance variables were included, just those that provided the best model fit. For instance FT, teaching and specialist status were not significant. Since star ratings were only available in T1, we did not incorporate them. Those variables significant at the 5% level are highlighted.

We can interpret the results from the multinomial logit as available beds being higher in Developmental culture compared to Clan and similarly in Hierarchical compared to Clan and also Rational compared to Clan.

The findings demonstrate a number of significant relationships between culture, hospital characteristics and performance. In summary, the results suggest that:

i) The average number of beds is lower in Clan compared to all other cultures. (This result corresponds with the findings in Fig. 4 and Table 4 where small hospitals were predominantly Clan culture.)

ii) Clinical negligence expenditure as a proportion of total expenditure is lower in Developmental compared to Clan culture and is higher in Rational compared to Developmental.

iii) Total number of imaging tests per available bed is higher in Developmental and Hierarchical than Clan.

iv) Management salaries (as a proportion of total salaries) are higher in Developmental and Rational than Clan.

v) Consultant salaries (as a proportion of total salaries) are higher in Developmental than Clan, but lower in Hierarchical and Rational than Developmental.

### Table 3
Ordered probit model of culture scores against star ratings, T1.

<table>
<thead>
<tr>
<th>Star ratings</th>
<th>Coefficient</th>
<th>Robust standard error</th>
<th>z</th>
<th>P &gt;</th>
<th>95% Confidence interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clan</td>
<td>0.005</td>
<td>0.013</td>
<td>0.420</td>
<td>0.675</td>
<td>−0.020 to 0.030</td>
</tr>
<tr>
<td>Developmental</td>
<td>0.040</td>
<td>0.012</td>
<td>3.270</td>
<td>0.001</td>
<td>0.016 to 0.064</td>
</tr>
<tr>
<td>Rational</td>
<td>0.021</td>
<td>0.018</td>
<td>1.150</td>
<td>0.250</td>
<td>−0.015 to 0.037</td>
</tr>
</tbody>
</table>

Cut 1

Cut 2

Cut 3

Fig. 3. Frequency distribution of culture type by star rating, T1.
vi) Nurse salaries (as a proportion of total salaries) are higher in Developmental and Rational than Clan.

vii) Median waiting times are lower in Developmental than Clan, but higher in Rational than Developmental.

viii) Daycases as a proportion of total inpatient spells (a measure of efficiency) are lower in Hierarchical than both Clan and Developmental.

The model passes all the tests associated with the multinomial logit as described in the Appendix A.

**Discussion**

The aim of this study was to extend previous cross-section analysis by looking at changes in senior management team
culture in English acute hospitals over three time periods between 2001/2002 and 2007/2008 to examine the relationship between
culture and performance over time and determine whether organizational values that are deemed important within a dominant
culture correspond with those aspects of performance at which the organization excels over time.

This study's contribution is to show that there is evidence that such associations do exist cross-sectionally, and that at least some of these relationships persist over time. This study provides important new information on the changing cultural landscape for English hospitals, and extends the evidence-base linking culture to performance in healthcare (Scott, Mannion, Marshall, & Davies, 2003) by demonstrating the enduring nature of some of these associations.

The Clan culture has remained prominent over the period 2001/2002 (53%) to 2007/2008 (39%), though it has seen a substantial
decline. The rise in the Hierarchical culture as a dominant culture may be associated with the increase of hierarchical controls and bureaucratic rules in the NHS, including the development of clinical guidelines, the introduction of professional protocols and the implementation of national standards of care (Davies & Harrison, 2003; Harrison & Smith, 2003). The increase in the competitive Rational culture as the most frequent type in 2007/2008 (40%) may be associated with changes in the policy context such as the promotion of patient choice, activity-based funding for acute care (Department of Health, 2002), stronger commissioning (Department of Health, 2004) and an expanded role for private sector providers (Mannion & Street, 2009). In this policy context competition is clearly articulated as the favoured lever for quality, safety and overall performance improvement (Department of Health, 2007). In short, over this period healthcare reforms have focused on the creation of explicit economic incentives and implementation of pro-market policies, and we might expect acute hospitals increasingly to adopt organizational strategies and management systems associated with the Rational culture (as implied by Fig. 1), for example to focus on competition as a means of gaining resources and patients by winning market share.

Overall though, the changes over time across all performance measures are towards a more blended culture, with a single dominant culture becoming less prominent. The shift towards a more blended culture encompasses a significant move out of Clan towards Rational cultures.
Table 4
Multinomial logit model, T1–T3 pooled.

<table>
<thead>
<tr>
<th>Multinomial regression</th>
<th>Number of obs— 295</th>
</tr>
</thead>
<tbody>
<tr>
<td>LR chi²= 102.35</td>
<td></td>
</tr>
<tr>
<td>Prob &gt; chi²= 0.000</td>
<td></td>
</tr>
<tr>
<td>Log likelihood= −297.266</td>
<td></td>
</tr>
<tr>
<td>Pseudo R²= 0.1469</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comparison group</th>
<th>A (Clan)</th>
<th>B (Developmental)</th>
<th>C (Hierarchical)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dominant culture</td>
<td>Coefficient</td>
<td>P &gt;</td>
<td>Z</td>
</tr>
<tr>
<td>B (Developmental)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average number of available beds</td>
<td>0.003</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Percent clinical negligence expenditure</td>
<td>−712.826</td>
<td>0.015</td>
<td>521.934</td>
</tr>
<tr>
<td>Total no. imaging tests per bed</td>
<td>0.010</td>
<td>0.023</td>
<td>0.004</td>
</tr>
<tr>
<td>Percent management salaries</td>
<td>0.530</td>
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<td>0.007</td>
</tr>
<tr>
<td>Percent consultant salaries</td>
<td>0.332</td>
<td>0.001</td>
<td>0.014</td>
</tr>
<tr>
<td>Percent nurse salaries</td>
<td>0.191</td>
<td>0.002</td>
<td>0.018</td>
</tr>
<tr>
<td>Median waiting time</td>
<td>−0.028</td>
<td>0.044</td>
<td>0.001</td>
</tr>
<tr>
<td>Daycase rate</td>
<td>1.705</td>
<td>0.417</td>
<td>−6.689</td>
</tr>
<tr>
<td>Constant</td>
<td>−18.794</td>
<td>0.000</td>
<td>11.943</td>
</tr>
<tr>
<td>C (Hierarchical)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average number of available beds</td>
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<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Percent clinical negligence expenditure</td>
<td>−190.892</td>
<td>0.486</td>
<td>560.389</td>
</tr>
<tr>
<td>Total no. imaging tests per bed</td>
<td>0.014</td>
<td>0.007</td>
<td>0.004</td>
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<tr>
<td>Percent management salaries</td>
<td>0.190</td>
<td>0.235</td>
<td>−0.341</td>
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<tr>
<td>Percent consultant salaries</td>
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<td>0.702</td>
<td>−0.382</td>
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<tr>
<td>Percent nurse salaries</td>
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<td>−0.128</td>
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<td>0.014</td>
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<td>−4.984</td>
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<td>−6.689</td>
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<td>Constant</td>
<td>−6.851</td>
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<tr>
<td>D (Rational)</td>
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<tr>
<td>Average number of available beds</td>
<td>0.003</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Percent clinical negligence expenditure</td>
<td>−152.437</td>
<td>0.435</td>
<td>560.389</td>
</tr>
<tr>
<td>Total no. imaging tests per bed</td>
<td>0.004</td>
<td>0.197</td>
<td>−0.217</td>
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<tr>
<td>Percent management salaries</td>
<td>0.226</td>
<td>0.052</td>
<td>0.099</td>
</tr>
<tr>
<td>Percent consultant salaries</td>
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<td>−0.224</td>
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<tr>
<td>Percent nurse salaries</td>
<td>0.103</td>
<td>0.010</td>
<td>−0.089</td>
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<td>0.007</td>
<td>0.372</td>
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<td>Daycase rate</td>
<td>−1.564</td>
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<tr>
<td>Constant</td>
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<td>9.352</td>
</tr>
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Coefficients significant at 1% or 5% are in bold.

The results from our analysis of the relationship between culture type and star ratings (in T1), and echoed in the ordered probit results, show that higher performing organizations tend to be clustered in the Developmental culture. The results from our examination of culture change over time relative to various structural and performance measures, suggest that FTs (those high performing hospitals with greater financial and managerial autonomy) tend to be increasingly clustered in the Rational culture. The Clan and Developmental cultures also tend to be the specialist hospitals which tally with the notion of these organizations being more innovative and entrepreneurial. The Clan culture is also strongly associated with smaller organizations where cohesion and staff morale may be easier to maintain.

In terms of the culture/performance relationship, the results seem to confirm our a priori hypotheses that those aspects of performance valued within a given culture are enhanced in hospitals that exhibit strong congruence with that culture. They also correspond very strongly with previous research (Davies et al., 2007).

Clan cultures tend to be more internally focused, smaller, and have a higher degree of specialisation. Dominant Developmental cultures seem to be associated with proportionally higher consultant and nurse salaries, which may relate to greater concern for clinical innovation and advancement and clinical teams being given greater freedoms and responsibilities. However Developmental cultures also have proportionally higher management salaries which may be associated with entrepreneurship and growth. Developmental cultures have lower clinical negligence expenditure which again supports the notion of these organizations solving clinical concerns in a dynamic and efficient way. Rational cultures are also associated with proportionally higher management salaries, which may reflect the greater emphasis on the role of managers as acquisitive competitive leaders. Developmental cultures also use more imaging (these include all imaging and radiodiagnostic exams and tests, including CT scans, MRI scans, ultra-sound, and so on) which may suggest a greater focus on clinical innovation. We find lower waiting times in the Developmental culture which we might anticipate, perhaps being more innovative and creative with the clinical management of waiting lists. Finally, daycase rates, a measure of efficiency, tend to be higher in the Developmental and Clan cultures. We might have anticipated this with the Developmental culture since we would expect greater efficiency associated with clinical innovation and dynamism. This result is perhaps surprising for the Clan culture.

Overall our findings support the hypothesis that specific domains of performance valued within a dominant culture are those on which organizations perform best. Future research might usefully incorporate longitudinal qualitative case studies to explore in-depth culture-performance relationships and changes over time, to build on earlier work in this area (Mannion, Davies, & Marshall, 2005b).

As suggested at the outset, the institutional economics literature argues that the cultural contexts within which senior managers work, affect their motivations and behaviour (Bowles, 1998). This
implies that senior managers espousing a particular organizational culture will influence the way in which those lower down the organizational hierarchy work and how they interact with others to influence the hospital’s performance. Organizational culture therefore appears to matter in the delivery of high performance in healthcare and our findings also suggest which sorts of cultures might be expected to enhance which aspects of performance. In the English NHS, several reforms have been premised on the assumption that major cultural change must be wrought alongside structural and procedural reform if the desired improvements in system-wide performance are to be secured (Davies, Nutley, & Mannion, 2000; Scott, Mannion, & Marshall, 2003). We have shown that organizational cultures have moved towards more blended cultures over the time period studied. The real challenge for the future, therefore, will be in encouraging blends which underpin valued aspects of performance.

Acknowledgements

Early data collection for this study was funded by the Department of Health Policy research programme while the later stages of data collection were funded by the NIHR Service Delivery and Organisation (SDO) Research and Development Programme. Ethics approval for this project was obtained from the NHS National Research Ethics Committee. Views expressed are those of the authors and not the funders. An earlier abbreviated version of this paper won the best poster prize at the iHEA 6th World Congress, Copenhagen, Denmark, 8–11 July 2007. We would like to thank those within the NHS who gave their time to make this investigation possible. We also thank the editor and four anonymous referees for very valuable comments received.

Appendix A. Supplementary material

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.socscimed.2012.10.014.

References