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Toward a Career Anchor Structure: An Empirical Investigation of Engineers

Laura Wils, Thierry Wils and Michel Tremblay

Contrary to Schein's theory of career anchors, which rests on the dominance of a single career anchor, the present study proposes an original career anchor structure that captures multiple dominant anchors. The analysis of data from a sample of 880 Quebec engineers supports this reconceptualization based on a circular model of career anchors. The new dynamics of career anchors shows that several anchors are complementary (e.g., creativity and challenge) while others are conflictual (e.g., challenge and security). In particular, the correlational analysis at the axial level indicates that the "self-enhancement" pole (managerial competence, identity) is negatively correlated with the "self-transcendence" (service/dedication to a cause, technical competence), whereas the pole "openness to change" (challenge, entrepreneurial creativity) is negatively correlated with the "conservation" pole (security, lifestyle). These findings can lead to more research in career management.

KEYWORDS: career anchor, value, engineer, correlation structure, multidimensional analysis

The theory of career anchors was put forth in the 1970s by Edgar Schein, of the Massachusetts Institute of Technology (MIT) (Schein, 1975, 1978, 1985, 1987, 1990, 1992, 1996). As individuals progress through their careers, they gradually develop what Schein calls a *career self-concept*, a product of the interaction between the individual and the workplace. This psychological process underlies the career orientations or career anchors that take shape around three poles, namely 1) self-perceived work talents and abilities, 2) self-perceived motives and needs and 3) basic values and attitudes (Schein, 1978).

Schein maintains that over time, a *single* career anchor emerges, that stabilizes, guides and constrains an individual's career path. When facing a difficult situation or choice at the workplace, people use a "dominant" career anchor that constitutes an affirmation of what is truly important to them in their careers. This career anchor does not change over time, but becomes explicitly manifested as the individual acquires work experience. Inspired by Schein, many researchers have operationalized this phenomenon, that we describe as unidimensional dominance (namely the

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predominance of a single anchor), by identifying the anchor to which an individual assigned the highest score.

Recently, several researchers have questioned the concept of unidimensional dominance (Derr, 1986; Feldman and Bolino, 1996; Martineau, Wils and Tremblay, 2005; Orozco-Atienda, 2005; Suutari and Taka, 2004; Yarnall, 1998). In an empirical study, Martineau, Wils and Tremblay (2005) concluded that some individuals internalize several strong anchors. The characterization of dominance as a multidimensional rather than as a unidimensional phenomenon evinces problems that had previously been unexplored. The dynamics of career anchors (or dynamic structure of career anchor relations¹) raise two questions: which anchors are mutually attractive (“compatibility,” characterized by an attraction between two anchors), and which anchors are mutually repulsive (“conflict,” manifested by repulsion between two anchors)? Consequently, this study attempts to clarify these questions by proposing a model of a career anchor structure and by submitting the anchors to an empirical test.

This research problem is important from both practical and theoretical standpoints. In practice, the fact that individuals can possess several career anchors gives them more options and flexibility in their career path management. To the extent that careers are increasingly unstable,² this manoeuvring room is advantageous for both the individual and the organization. For researchers, the multiplicity of career anchors engenders a new theoretical perspective to better understand the complexity and diversity of career paths.

Reference Framework

The Issue of Dominance of a Single Career Anchor

Theories of Career Anchors

Most studies of career anchors have been conducted by Schein and his students. Schein's (1975) first major study was carried out at MIT in 1961, on 44 experienced men enrolled in an executive development program. He subsequently supervised 14 master's theses, which relied uniquely on data collected through interviews (Feldman and Bolino, 1996). Of these studies, the largest sample population consisted of only 40 subjects (Schein, 1987). Schein identified five career anchors in 1975 (managerial competence, technical competence, security/stability, entrepreneurial creativity and autonomy/independence) and suggested that additional anchors could be found such as the identity, service and variety anchors (Schein, 1978) that DeLong measured in 1982. Schein subsequently proposed three additional career anchors: service/dedication to a cause (related to the service anchor identified by DeLong), challenge (related to the variety anchor of DeLong) and lifestyle (Schein, 1985, 1987, 1990, 1992).

Further, several authors demonstrated that the security anchor comprises two distinct anchors: *organizational security* and *geographical stability* (Crépeau *et al.*, 1992; DeLong, 1982; Igbaria and Baroudi, 1993; Igbaria, Kassiech and Silver, 1999; Petroni, 2000). Therefore, there are currently a total of 10 measured career anchors:³ the nine anchors defined by Schein (managerial competence, technical competence, security,

stability, entrepreneurial creativity, autonomy/independence, service/dedication to a cause, challenge, lifestyle) and the identity anchor defined by DeLong (1982).

The Artefact of Unidimensional Dominance

In Schein's studies, the career anchors are measured both qualitatively and quantitatively. First, respondents were interviewed to determine *their* career anchors. They were asked to discuss their current choice of career and the reasons that they changed jobs within the organization. In 1985, Schein created a questionnaire titled "*Career Orientations Survey*," containing 41 statements. In 1990, this questionnaire was revised to 40 statements (five statements for each of the eight career anchors) and in that version, respondents were asked to evaluate the veracity of the statements on a scale ranging from 1 ("never true") to 6 ("always true") (Feldman and Bolino, 1996). The results were then tabulated for each of the eight categories of items. The category with the highest score was considered *the* career anchor of the individual. Finally, Schein used a triangulation methodology to identify the dominant anchor: participants were interviewed, then asked to complete a questionnaire and discuss all the results.

Similarly, Nordvik (1991), of the University of Trondheim, linked Schein's career anchor theory to the typology of Holland (1966, 1985a, 1985b). His sample of 725 Norwegian adults was heterogeneous in terms of occupation and sex (52% men, 48% women). Nordvik did not use Schein's questionnaire; rather, his scale forced individuals to make choices (forced choice format). As a result, a strong career anchor could be obtained only to the detriment of a weak career anchor (Nordvik, 1991). Arguably, these researchers were implicitly convinced that individuals had only a single dominant career anchor. Thus, this unidimensional dominance is somewhat artificial in that it results from an arbitrary methodological choice.

Existence of Multiple Dominant Anchors

Feldman and Bolino (1996) noted that in Schein's study (1978), almost one third of the respondents had a multiple career profile, suggesting the possibility of the simultaneous existence of primary and secondary anchors. Specifically, they observed that: "(...) in his 1978 empirical study of 44 MIT Sloan Fellows, 10 out of the 44 respondents (or 23%) responded they held two career anchors equally strongly while 4 of 44 (or 9%) held three career anchors equally strongly" (Feldman and Bolino, 1996: 99). This observation was confirmed by Martineau, Wils and Tremblay (2005), who found that of the 900 Québec engineers in their sample, 30.3% had a dominant anchor, which means that 69.7% possessed multiple anchors. Their finding is particularly compelling because dominance was operationalized in different ways, including a method based on SEM (standard error of measurement). This multidimensional dominance, these authors assert, is a sign of "indifferentiation," that is internalization of several high anchors. Thus, the majority of individuals might possess several dominant career anchors simultaneously. The evidence in support of the "indifferentiation thesis" has led a growing number of researchers to question the theory of the dominant career anchor (Derr, 1986; Feldman and Bolino, 1996; Martineau, Wils and Tremblay, 2005; Orozco-Atienda, 2005; Suutari and Taka, 2004; Yarnall, 1998).

Indifferentiation and Structuring of Career Anchors

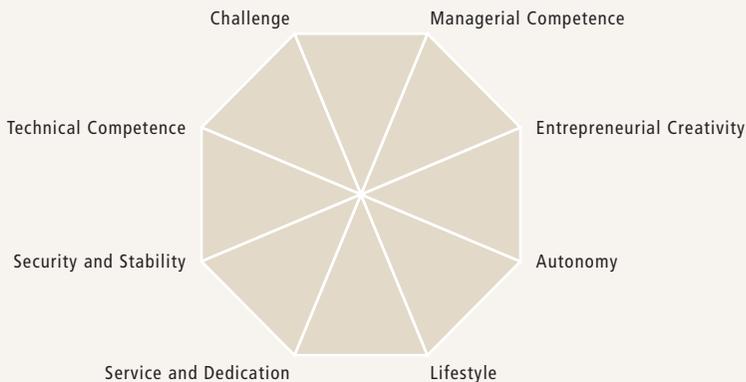
The Octagonal Model of Career Anchor Structure

Feldman and Bolino (1996) argue that the centrality of career anchors applies within each of the three groups of anchors (talents and abilities, motives and needs, and attitudes and values), as opposed to within all anchors combined, as Schein claims. The technical competence, managerial competence and entrepreneurial creativity anchors pertain to the work *talents* of individuals; they centre on the work that individuals perform day by day. The security/stability, autonomy/independence and lifestyle anchors represent *motives and needs*; they refer to the way individuals attempt to structure their work, according to their basic personal desires and their personal lives. Lastly, the service/dedication to a cause anchor and the challenge anchors represent *attitudes and values*; they are related to ways individuals identify with their occupations and with their organizational cultures. Feldman and Bolino (1996) add that an individual can have a dominant career anchor in each of the three categories, which would explain the existence of primary and secondary career anchors, which are thus complementary. Further, they posit that an individual can possess more than one career anchor owing to personal ambivalence toward certain career choices or objectives.

To better grasp the dynamics among these three career poles, Feldman and Bolino (1996) proposed an octagonal career anchor structure model (see Figure 1). This model illustrates the “proximity” of “compatible” or “complementary” anchors (i.e. connected to the octagon, such as technical competence and challenge) and an opposition between other anchors considered “incompatible” (diametrically opposed corners of the octagon, such as security/stability and entrepreneurial creativity).

This model depicts an intriguing, original career anchor dynamic. Nonetheless, the authors only partly explain the logic behind the structure:

FIGURE 1
The Octagonal Career Anchor Structure



Source: Feldman and Bolino (1996)

Based on both the theoretical definitions of Schein's career anchor types and Nordvik's initial results, then, we might expect that security, service, and lifestyle would cluster together, that entrepreneurial creativity would be orthogonal to security, and that challenge would be orthogonal to lifestyle (Feldman and Bolino, 1996: 106-107).

Critique of the Octagonal Model

The career anchor structure proposed by Feldman and Bolino (1996) has one major flaw: this mainly inductive model is based solely on the study of Nordvik (1991). If the entire body of empirical literature on career anchors is taken into consideration, several contradictions between the conceptual model and the empirical evidence emerge. Consider the relationship between the managerial competence anchor and the technical competence anchor. In Nordvik (1991), these two anchors never appear in strong opposition, which implies that they are not incompatible anchors (hence their relative proximity within the octagonal model as shown in Figure 1). Nordvik (1991) maintains that the managerial competence anchor is opposed to the service/dedication to a cause anchor (managerial competence anchor obtains the highest factor loading of 0.81, whereas the lowest factor loading of -0.47 was seen in the service/dedication to a cause anchor on the first factor of factor analysis). However, Nordvik (1996) later found a sharp contrast between the managerial competence anchor and the technical competence anchor: the technical competence anchor obtained the highest factor loading (0.85) and the managerial competence anchor obtained the lowest factor loading (-0.73) on the second factor of factor analysis. In the literature, significant negative correlations ranged between $r = -0.48$ and $r = -0.04$, were found between the managerial competence anchor and the technical competence anchor (Baroudi, 1988; Danziger, Rachman-Moore and Valency, 2008; Igbaria and Baroudi, 1993; Igbaria, Kassiech and Silver, 1999; Lee and Wong, 2004; Petroni, 2000; Roger, 2006). It therefore seems that the location of the technical competence anchor within the octagonal model is not consistent with the results of various empirical studies.

Another important contradiction concerns the placement of the orthogonal position (opposites) between the technical competence anchor and the autonomy/independence anchor. The findings of Nordvik (1991) do not confirm opposition between these two anchors (factor loading of 0.90 for the technical competence anchor versus a factor loading of 0.03 for the autonomy/independence anchor on the second factor). Several empirical studies failed to find opposition between the technical competence anchor and the autonomy/independence anchor, as the correlations observed in the literature are between $r = 0.20$ and $r = 0.36$ (Baroudi, 1988; Danziger, Rachman-Moore and Valency, 2008; Igbaria and Baroudi, 1993; Igbaria, Kassiech and Silver, 1999; Lee and Wong, 2004; Petroni, 2000; Roger, 2006). Moreover, two studies by Nordvik (1991, 1996) reveal that the autonomy/independence anchor is opposed to the security anchor (both organizational and geographical), which is compatible with the positioning of these anchors within the octagonal model. In short, the orthogonal positioning of the technical competence anchor and the autonomy/independence anchor in the octagonal model does not correspond with the empirical results.

More recently, Roger (2006) empirically tested the octagonal model of career anchor structure. The results of this study do not provide conclusive evidence of the positioning of the anchors on the octagon proposed by Feldman and Bolino (1996). For one, the management anchor reveals stronger opposition to the lifestyle anchor (correlation of -0.49, significant at $p < 0.01$) than to the service/dedication to a cause anchor (correlation of -0.35, significant at $p < 0.01$), whereas the inverse was expected. Second, the autonomy/independence anchor is opposed to the security/stability anchor (correlation of -0.54, significant at $p < 0.01$); yet greater opposition was expected with the technical/functional competence anchor, which was not empirically established (non significant correlation between the autonomy/independence anchor and the technical/functional competence anchor). These results should nonetheless be interpreted prudently, because both Roger (2006) and Nordvik (1991, 1996) measured career anchors with an instrument consisting of items which are based on paired opposite anchors. This measurement strategy produces valid results only if the items oppose incompatible rather than compatible anchors.

Such contradictions underline the urgent need for theoretical arguments that justify the career anchor structure. Even if, as Feldman and Bolino (1996) maintain, career anchors belong to three different categories (talent and abilities, motives and needs, attitudes and values), the distinction between a motive, a need and a value is unclear. In addition, most anchors demonstrate an affinity with the motivational domains described by Schwartz (1992), whose value structure can constructively serve as a theoretical foundation for a career anchor structure. The anchors can thus be construed as values that guide career decisions.

Circular Model of Career Anchor Structure

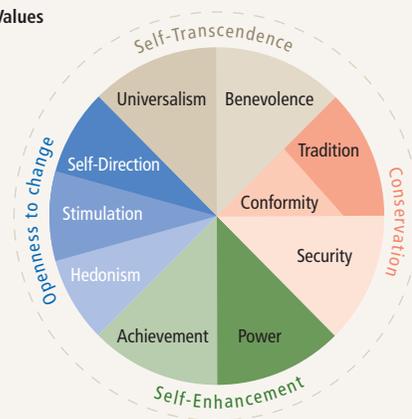
The Value Structure Model

Shalom H. Schwartz introduced the theory of the universality of the value structure in 1992. Building on the earlier definitions, he defined the universe of values to reveal their global and hierarchical nature. Accordingly, values are 1) concepts or beliefs, 2) that pertain to desirable end-states or behaviours, 3) that transcend specific situations, 4) in guiding selection or evaluation of behaviours and events and 5) that are ordered by relative importance as principles that guide people's lives (Schwartz, 1992: 4). Values are purportedly universal because they depend on common requirements such as satisfaction of "needs of individuals as biological organisms, requisites of coordinating social interaction, and survival and welfare needs of groups" (Schwartz, 1992: 4).

Schwartz' value structure model, based on studies carried out in 20 countries, explains the dynamics of values on two levels. On an aggregate level, two perpendicular axes divide the circular model into four distinct quadrants (see Figure 2). The horizontal axis opposes "openness to change," and "conservation," whereas the vertical axis contrasts "self-transcendence" and "self-enhancement" (also called "self-affirmation"). At a more specific level, the circumplex of values is divided into ten motivational domains: self-direction, stimulation, hedonism, achievement, power, security, conformity, tradition, benevolence and universalism. These motivational

domains are not independent from each other; they can be compatible or antagonistic. Therefore, similar to the career anchor model of Feldman and Bolino (1996), the circular model of Schwartz (1992) illustrates relations in that two adjacent motivational domains correspond to compatibility, whereas two diametrically opposed motivational domains illustrate conflicts. The intersection of these two levels specifies a circular value structure. First, "openness to change" (which includes the motivational domains of self-direction, stimulation and hedonism) contradicts "conservation" (comprising security, conformity and tradition). In addition, "self-transcendence" (which includes the motivational domains of universalism and benevolence) conflicts with "self-enhancement" (made up of power and achievement). Note that the concept of spirituality, which was formerly included in the model, was removed by Schwartz (1992) because of its lack of stability across studies. Lastly, because the values form a continuum, new values can be discerned. For instance, Wach and Hammer (2003) recommended that a motivational domain be added to the circular model, that of quest for knowledge, one pole of which is made up of "rational-intellectual truth (situated beside "self-transcendence" and "openness to change"). This new domain is germane to our study of engineers since the dual career path of engineers can be either technical (development of specialization) or managerial (supervision of projects).

FIGURE 2
Schwartz's Universal Structure of Values



Source: Schwartz (1992)

Link between Motivational Domains and Career Anchors

If motivational domains and career anchors overlap from the standpoint of values, it is worth comparing Schwartz' (1992) model to that of Feldman and Bolino (1996). Some motivational domains are directly linked to career anchors. Accordingly, the domain of self-direction is associated with the anchors of autonomy/independence and entrepreneurial creativity because this motivational domain and these career anchors share common values, namely independence, freedom and creativity. The domain of stimulation is linked to the anchor of challenge because this domain and anchor rest on the same values, namely, varied life and exciting life. The power value domain corresponds to the

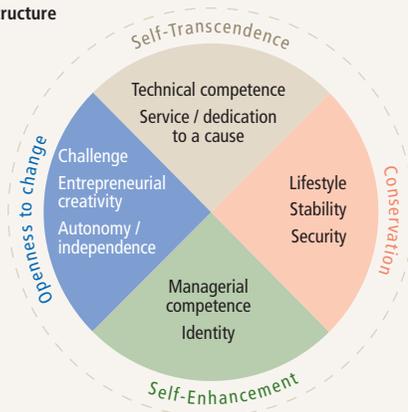
anchors of managerial competence and identity because they rest on the same values, namely social power, authority, wealth and social recognition. The domain of security is linked to the anchors of security, stability and lifestyle because they share common values, namely family security and health. The domain of benevolence is linked to the service/ dedication to a cause anchor because both concepts encompass common fundamental values such as the meaning of life and mature love. Lastly, the domain of quest for technical knowledge (rational-intellectual truth), which encompasses the value of knowledge and reason, is paired tentatively with the technical competence anchor. Consequently, contrary to Feldman and Bolino (1996), career anchors are not divided into only three distinct categories (talents and abilities, motives and needs, and attitudes and values), but rather into several different motivational domains. The dynamics of career anchors can therefore be observed within each motivational domain, which can comprise several complementary career anchors (principle of compatibility) and between orthogonal motivational domains, which oppose other conflictual anchors (principle of incompatibility).

Proposal of a Circular Model of Career Anchor Structure

These observations lead us to propose a circular model of career anchor structure that rests on the correspondence between motivational domains and career anchors. Since theoretical links were established between those two concepts, the objective of this research is to demonstrate that career anchors can be structured within the four quadrants of Schwartz's model. Consequently, positively correlated career anchors have been placed within the same quadrant, relative to the value system of Schwartz (1992). This model retains only the axes, because the structure of the axial dynamics (the four quadrants) seems more universal than the structure of the dynamics of motivational domains. In fact, Schwartz (1992) has demonstrated the universality of the structure of values, mainly among teachers, although the dynamics of motivational domains appears more unstable for other job categories (Voss, 2002). The dynamics between the two axes of Schwartz and the 10 career anchors are shown in Figure 3.

FIGURE 3

Circular Model of Career Anchor Structure



We will now examine the empirical evidence in support of the logic of the structure within each of the quadrants of the model. In the left quadrant, a correlation of 0.37 (significant at $p < 0.01$) has been found between the challenge and entrepreneurial creativity anchors (Igbaria, Kassiech and Silver, 1999), a correlation of 0.24 (significant at $p < 0.001$) between the challenge and autonomy/independence anchors (Igbaria and Baroudi, 1993), and a correlation of 0.45 (significant at $p < 0.001$) between the entrepreneurial creativity and the autonomy/independence anchors (Igbaria and Baroudi, 1993). In the right quadrant, a strong correlation of 0.51 (significant at $p < 0.01$) links the lifestyle and stability anchors (Petroni, 2000), a relation of 0.29 (significant at $p < 0.05$) connects the lifestyle and security anchors (Igbaria, Kassiech and Silver, 1999) and a relation of 0.34 (significant at $p < 0.01$) was observed between the security and stability anchors (Petroni, 2000). In the bottom quadrant, the managerial competence and identity anchors are correlated at 0.51 (significant at $p < 0.001$, Baroudi, 1988). No significant correlation published to date has confirmed the relationship between the technical competence and service/dedication to a cause anchors.

Now we examine the empirical evidence of the logic of the structure between the orthogonal poles of the two axes. The empirical results presented as part of the critique of the model of Feldman and Bolino (1996) indicate that the technical competence anchor and the managerial competence anchor can be legitimately placed on opposite sides of the diagram. Similarly, Igbaria, Kassiech and Silver (1999) noted a negative correlation between the anchors of entrepreneurial creativity and security (-0.46 significant at $p < 0.01$). Moreover, Petroni (2000) observed a negative and significant correlation between the anchors of entrepreneurial creativity and stability (-0.24 significant at $p < 0.01$). The empirical evidence that underlies this career anchor structure model must be interpreted with caution because the correlation coefficients between the anchors were not calculated based on data standardized on an individual basis, as Schwartz recommends. In addition, the anchor measurement instruments vary according to the study and are not always reliable (in some cases Cronbach's alpha is below 0.70). For these reasons, further empirical testing is necessary. To guide this research, we posit the following hypotheses:

- HYPOTHESIS 1:** The technical competence anchor and service/dedication to a cause anchor are part of the same domain or quadrant (corresponding to the values of the "self-transcendence" pole in Schwartz' terminology);
- HYPOTHESIS 2:** Managerial competence and identity anchors belong to the same domain (corresponding to the values of the "self-enhancement" pole);
- HYPOTHESIS 3:** The entrepreneurial creativity, autonomy/independence and challenge anchors lie within the same domain (corresponding to the values of the "openness to change" pole);
- HYPOTHESIS 4:** The lifestyle and security anchors belong to the same domain (corresponding to the values of the "conservation" pole);
- HYPOTHESIS 5:** The career anchors associated with the "self-transcendence" pole are negatively correlated with the anchors associated with the "self-enhancement" pole;
- HYPOTHESIS 6:** Career anchors associated with the "openness to change" pole are negatively correlated with the anchors associated with the "conservation" pole.

Methodology

Research Strategy

This study is based on a questionnaire survey of engineers in Quebec. Two data collection methods were used. First, a pre-tested questionnaire was sent to engineers at three organizations (two private companies and one municipality). Of the 720 questionnaires sent, 374 were returned, for a response rate of 51.9%. Second, additional data were collected through the *Ordre des ingénieurs du Québec*. A random sample of 808 men was selected, from which 147 usable questionnaires (18.2%) were obtained. Further, the questionnaire was mailed to women members of the *Ordre des ingénieurs du Québec* to adjust the proportion of women in the sample, given that this profession is male-dominated. Of the 1,295 questionnaires sent to the second sample, 379 usable forms were returned for a total response rate of 29.3%. Note that the response rate obtained in the first phase is higher than that obtained in the second phase because we had previously received support for our project from the organizations concerned. Overall, the response rate for the study was 32%, a potentially usable sample of 900 engineers. According to the statistics compiled by the *Ordre des ingénieurs du Québec*, our sample is representative of the population in several respects. For example, the average age of the sample is 38, versus 40.3 for the population. No significant differences were detected for other variables such as seniority or diplomas held.

Of these 900 respondents, 20 individuals were excluded because they had left the field of engineering (13 career changes) or because they did not indicate their current career orientation (7 missing values). This study is therefore based on a final sample of 880 engineers. Given that the purpose of this research is to test the robustness of the career anchor structures using an exploratory statistical technique, namely multidimensional analysis, this sample is very satisfactory. Notably, the size greatly exceeds the minimum of 150 observations suggested by Schwartz (1992) to obtain a stable estimate of correlation coefficients. The multidimensional analysis of similarities (*MultiDimensional Scaling or MDS*) was performed using SYSTAT software, whereas the correlational analyses were performed with SPSS. To calculate the correlational structure at the axial level, raw data were standardized on an individual basis (ipsative measures) as Schwartz suggests.

Measurement of Career Anchors

The career anchor indicators (34 items) were formulated based on the works of Schein (1978) and DeLong (1982). Respondents were asked to evaluate the importance of each of these items on a Likert scale (1 = not all important to 5 = extremely important). Eight career anchors were measured by these items: managerial competence (9 items), technical competence (4 items), security (3 items), creativity (2 items), autonomy/independence (4 items), service/dedication to a cause (2 items), challenge (7 items) and lifestyle (3 items). Usually, researchers try to measure the importance of anchors by creating composite scales. We did not do so for two reasons. First, we were not interested in the anchors per se,

but rather in their dynamic structure following the circular logic of Schwartz. According to Wach and Hammer (2003), the structure of values is a much more significant problem than the importance placed on values. Second, the items from the work of Schein are ambiguous in that the author asserts that the anchors concern three components (talents and abilities, motives and needs; and attitudes and values), but it is very difficult to link each item to one or more of these components. Conceptually, the motives are very close to the values, which is why Schwartz associates values with motivational domains. We therefore chose to associate each of the items with a motivational domain using fundamental values as decision criteria.

Before we subjected the anchors to multidimensional analysis, we had to solve the problem of correspondence between the career anchor items, the values and the motivational domains used by Schwartz. This correspondence was resolved in three ways. First, a single career anchor indicator could correspond precisely to one of Schwartz's values (for example, the indicator of the managerial competence anchor measuring *importance placed on earning a high salary* was tied to the value "wealth" of the motivational domain "power"). This situation applied to several of the values examined (wealth, success, social power, influence, varied life and pure challenge). Second, several career anchor indicators could correspond to a particular value in Schwartz's model (for example, two indicators of the managerial competence anchor measuring *importance placed on management* were tied to the value "authority" of the motivational domain "power"). In this case, we created composite variables. Seven such variables were introduced: authority (two indicators, Cronbach's alpha = 0.74), social recognition (three indicators, alpha = 0.71), quest for technical knowledge (five indicators, alpha = 0.78), security (two indicators, alpha = 0.82), freedom (three indicators related to autonomy, alpha = 0.73), service (two indicators related to helping others, alpha = 0.78) and quality of life at work (QLW), associated with the motivational domain security (three indicators, alpha = 0.74). Two indicators of creativity (entrepreneurial creativity and creativity) linked to the motivational domain "stimulation" were entered separately (instead of in a composite variable) because the alpha was too low (0.61). In the third scenario, the remaining career anchor indicators (related to job change, geographical change, project, work climate and work conditions) could not be easily associated with a particular value. To determine their positioning on the map (their relationship with Schwartz's model), they were also entered in the analysis. In conclusion, most of the items could be associated with one of the motivational domains. For example, the nine items linked to the managerial competence anchor were associated with the motivational domain of power as follows: one item associated with wealth, one with social power, one with influence, two items associated with authority and three items associated with social recognition. The ninth item (success) was associated with the motivational domain of accomplishment. All nine items belong to the self-affirmation pole.

TABLE 1
Examples of Correspondence between Items, Anchors and Schwartz's Values

Examples of <i>career anchor items</i>	This item measures:	Relationship with values and motivational domain of Schwartz (1992) (Value/DOMAIN)
FIRST TYPE OF CORRESPONDENCE (a single career anchor item corresponds to a single value within a motivational domain):		
<i>Earning a high salary</i>	Managerial competence	Wealth/POWER
<i>Seeking difficult challenges</i>	Challenge	Challenge / STIMULATION
<i>Being able to create or develop something new or different that results from my ideas</i>	Creativity	Creativity / SELF-DIRECTION
SECOND TYPE OF CORRESPONDENCE (several career anchor items correspond to a single value within a motivational domain):		
<i>Holding a managerial position in my area of specialization</i>	Managerial competence	Authority / POWER
<i>Being able to use my supervision, management and control talents at all levels</i>	Managerial competence	Authority / POWER
<i>Having good job security</i>	Security	Family security / SECURITY
<i>Having an opportunity to work in organization that gives me long-term stability</i>	Security	
THIRD TYPE OF CORRESPONDENCE (no association could be made between a specific career anchor item and a value):		
<i>Having an opportunity to move to another city or country</i>	Geographical security	? / SECURITY

Data Analysis Method

Schwartz (1992) recommends multidimensional analysis of similarities of the "Guttman-Lingoes smallest space analysis" or SSA type. This statistical method evinces the similarities between variables in a geometric space using the fewest dimensions possible (Evrard, Pras and Roux, 2003). Given that Schwartz' value structure rests on two axes ("self-transcendence"/"self-enhancement" and "openness to change"/"conservation"), the positioning of points (items reflecting values) appears in a bi-dimensional space (called a "map"). The SSA method conveys the distance between two variables, from the correlation matrix between the variables (items). The distance between the two variables (represented by two points on the map) thus expresses the inverse of the correlation. The greater the similarity between two variables, the closer they are in geometric space. Moreover, the closer a point is to the centre of the map, the stronger its correlations with the other points. The accuracy of the representation between the points on the map and the correlation matrix is reproduced in the form of a stress measure (called the "coefficient of alienation"). The weaker the stress index, the better the fit. According to Schwartz and Sagiv (1995), it is difficult to obtain

a coefficient of alienation of less than 0.15 when a cognitive system such as that of values is analyzed. Schwartz as well as other researchers such as Spony (2003) usually obtained coefficients ranging from 0.25 to 0.31. Lastly, raw data are used to calculate the correlation matrix in the multidimensional analysis.

Interpretation of the Map

In a multidimensional analysis, axes are less important than the regions of the map because they have no particular significance. If the variables cover the theoretical domain exhaustively, the points are distributed uniformly throughout the map (according to a circular structure with no blank spaces). The division of space into regions is crucial. In general, the lines drawn may be straight or dotted, providing that they do not intersect. The delineation underlying the multidimensional analysis can explain why two geometrically close points might belong to different regions, whereas two more distant points can be part of the same region. Lastly, sometimes several SSAs must be performed, because Schwartz' methodology entails deleting all the values situated in an area distant from that foreseen by the theory (Schwartz, 1992: 20-23).

Results

First Multidimensional Analysis

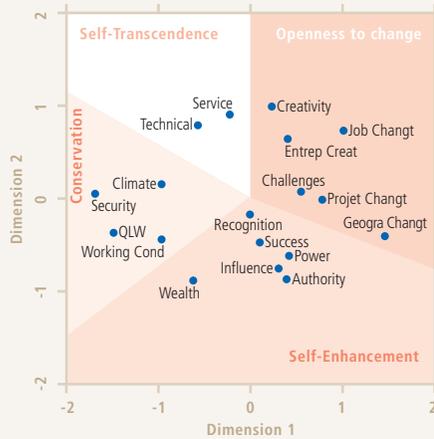
The data analysis entailed two SSAs. In the first analysis (coefficient of alienation of 0.26), only two items are positioned in zones other than those theoretically projected. First, variety in life is located in the area encompassing items associated with the "self-enhancement" pole, whereas it should have fallen in the area associated with the "openness to change" pole. Second, freedom overlaps the area of "conservation" and that of "self-transcendence", whereas it should have been situated in the zone associated with the "openness to change" pole.

Second Multidimensional Analysis

Once these two items were removed in accordance with Schwartz's methodology (1992: 20-23), a second analysis was performed (coefficient of alienation = 0.25). As Figure 4 illustrates, the bottom quadrant corresponds with the "self-enhancement" pole. This quadrant contains items related to the domains of power (wealth, authority, social power and social recognition) and achievement (success, influence). Therefore, the managerial competence anchor and the identity anchor are part of the same family of managerial anchors that produce an alpha of 0.76 for the four items linked to power⁴ and an alpha of 0.64 for the two items associated with achievement. Opposite this quadrant is the domain associated with the "self-transcendence" pole (top quadrant) as indicated by the items related to the domain of quest for knowledge (technical competence anchor) and benevolence (service/dedication to a cause anchor).

In addition, the left quadrant contains the item associated with the domain of security (security anchor) along with the items related to QLW, work conditions and work climate (lifestyle anchor), namely the "conservation" pole. Lastly, the right

FIGURE 4
Map (SSA # 2)



quadrant, that of “openness to change”, encompasses items related to self-direction (entrepreneurial creativity anchor) and stimulation (challenge anchor) along with items related to job change, geographical change and project change. Incidentally, the last three items related to change suggest the existence of a domain that may include a new career anchor that has not yet been operationalized such as the internationalism anchor, characterized by inter-country mobility. To summarize, the first four hypotheses have received strong empirical support. Nevertheless, more research needs to be done to locate the autonomy/independence anchor and the stability anchors on the map.

Correlational Structure

Schwartz recommends the use of relative data to compute the correlational structure. The data were therefore standardized on an individual basis before the correlation coefficients between the axes were calculated to perform correlational analysis at the axial level. In general, the correlational structure between the items *within* each quadrant (based on data standardized by individuals) is characterized either by positive and significant correlations (for example, correlation of 0.36 between influence and authority; correlation of 0.08 between quest for technical knowledge and service), or by non-significant correlations (for example that between work conditions and work climate). The only exception is seen in the domains of the “openness to change” pole, where the items related to geographical change and project change show slightly negative correlations with the other items. These results are also consistent with the first four hypotheses.

Based on the items identified in each of the quadrants (map of second SSA), four composite variables were calculated after the data were standardized by individual. These four variables correspond to the four poles, namely “self-enhancement”, “self-transcendence”, “openness to change” and “conservation”. The correlational analysis at the axial level⁵ indicates that the “self-enhancement” pole is negatively correlated

with the “self-transcendence” pole ($r = -0.44$ significant at $p < 0.01$) whereas the pole “openness to change” is negatively correlated with the “conservation” pole ($r = -0.49$ significant at $p < 0.01$). Our results confirm Hypotheses 5 and 6. Moreover, the “self-transcendence” pole is weakly correlated with the “openness to change” ($r = -0.07$ significant at $p < 0.05$) and “conservation” ($r = 0.04$ not significant) poles. Nonetheless, the “self-enhancement” pole is negatively linked to the “openness to change” ($r = -0.46$ significant at $p < 0.01$) and “conservation” poles ($r = -0.44$ significant at $p < 0.05$).

Discussion and Conclusion

Theoretical Contribution

This research makes an important contribution to the career field by proposing an original career anchor structure model that combines a theoretical logic (Schwartz' value structure) with affirmation by compelling empirical evidence. The results of this study argue in favour of the thesis of indifferenciation along with a reconceptualization of the concept of “career anchors”. Currently, the notion of indifferenciation is conceptually confused because it concomitantly refers to a particular career value (service/dedication to a cause anchor), to a subset of career values associated with a domain (identity anchor), to a set of career values defining a domain (entrepreneurial creativity anchor), and to values belonging to several domains (managerial competence anchor). According to our model, a domain, i.e. a homogeneous group of career values, may serve as an anchor point and allow better conceptual unity. By extrapolating slightly, career values can even be considered a subset of “work values”. Indeed, the map of the second multidimensional analysis contains several empty spaces that can be explained by the absence of values. It remains to be determined whether these empty spaces should be filled by new career values or by work values.

Several authors assert that some anchors repel each other whereas others attract each other. This phenomenon of repulsion and attraction, explained in Martineau, Wils and Tremblay (2005), was confirmed by the correlational structure at the axial level presented in this study. The strong negative correlations between the poles of the two axes (“self-transcendence”/“self-enhancement” and “openness to change”/“conservation”) are one example. In particular, it is worth comparing the opposition between “self-transcendence” and “self-enhancement” with professional malaise and culture shock (Guérin, Wils and Lemire, 1999). The “self-transcendence pole” may thus refer to a professional logic and the “self-enhancement” pole to a managerial or even bureaucratic logic. The fact that the item “freedom” is linked to the quest for technical knowledge may be interpreted as an individual need for ethics and professional rigor that is squelched by organizational constraints. This interpretation implies that it may be worth dividing the autonomy/independence anchor into two to differentiate autonomy at work and professional independence, which does not belong to the same value domain in our model. Another contribution of this research is that it standardized the data by individual, which effectively educes repulsion and attraction between career anchors. To our knowledge, studies

of career anchors have reported the correlation coefficients between anchors but have not standardized the data on an individual basis, and thus do not elucidate the correlational structure between career anchors. For example, the correlation between the "self-enhancement" pole and the "self-transcendence" pole in our study would have been 0.24 with the raw data (versus -0.44 with relative data), whereas the correlation between the "conservation" pole and the "openness to change" pole would have been 0.12 (versus $r = -0.49$ with relative data).

Avenues of Future Research

In general, the instruments used in the extant studies to measure career anchors do not possess robust psychometric qualities. Our instrument is not immune to this criticism in that several anchors need to be better measured. For example, the service/dedication to a cause anchor of our study measures the notion of help much more effectively than that of dedication to a cause. Therefore, construction and validation of a new measurement instrument is an essential step in the advancement of knowledge of career anchors. Roger (2006) developed a new measurement instrument based on a comparative scale (adapted from the work of Nordvik, 1991, 1996). This instrument is based on items consisting of paired opposite anchors with a continuum of six points between them. The main weakness of this instrument is that it forces oppositions that are, in some cases, "artificial" in that they did not rest on a theoretical framework. For example, one can legitimately question whether management should be opposed to independence, security or quality of life, as in the instrument put forth by Roger (2006). According to our structure model, these anchors are more compatible (proximity) than incompatible (i.e. in strong opposition). As the instrument used by Nordvik (1991, 1996) was not available, it is difficult to determine whether his instrument suffers from the same weaknesses. Whatever the case, a forced choice instrument can be developed only when the oppositions and compatibilities between the anchors are grounded in solid empirical proof and theoretical justification. The instrument designed by Roger (2006) was primarily intended to clarify opposition between incompatible anchors, which was believed to be impossible for a traditional instrument inspired by the works of Schein to achieve, as Roger (2006) clearly demonstrated in his study. Indeed, one of the contributions of this study was to show that oppositions between anchors can be deduced by a traditional instrument if data are standardized on an individual basis. It is therefore not necessary to use a forced-choice instrument to obtain negative correlation coefficients between incompatible anchors. Over the short term, there is undoubtedly less risk inherent in improving the traditional instrument. One way to do so would be to measure anchors in terms of career values, inspired by the instrument of Schwartz (1992). Career values provide more insight into career paths. Several studies (Tremblay, Wils and Proulx, 2002) have shown the existence of a link between career anchors (e.g. managerial competence) and career paths (e.g. management). Although these studies make valuable contributions, it is worth determining why an individual chooses a career in management. According to our model, this explanation lies in values: individuals choose a career in management because they place considerable importance on values such as social power, wealth

and social recognition. Further, the examination of values adjacent to the self-affirmation pole can also better explain the different types of management paths.

Lastly, a limitation of this research is the specificity of the sample, made up uniquely of engineers. Further studies are required to allow us our results to be generalized to other professions. Such studies would clarify the universal nature of the dynamics of career anchors.

Notes

- 1 This concept refers to the “dynamic structure of value relations” proposed by Schwartz (1992: 13).
- 2 We thank one of the reviewers for bringing this point to our attention.
- 3 Several authors have identified other career anchors which are not presently operationalized, such as the warrior career anchor (Derr, 1980), the non-stop learning career anchor (Applin, 1982 as cited in Orozco-Atienda, 2005: 15), the influence and impact career anchors (Webb, 1992), the salary career anchor (Purvey, 1996) and the internationalism anchor (Suutari and Taka, 2004).
- 4 Whenever a career concept was measured by several items, alphas were reported.
- 5 Given that the structuring of values should remain stable despite sociodemographic variables (Schwartz, 1992), we subjected the “common” structure of career anchors to gender-based analysis (Wils, Wils and Tremblay, 2007). The dynamics at the axial level could then be confirmed for both women and men, which enabled us to conclude that the structure was robust relative to this sociodemographic variable.

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RÉSUMÉ

Vers une structuration des ancrés de carrière : une étude empirique auprès des ingénieurs

Le modèle des ancrés de carrière de Schein (1978) propose que les individus ne possèdent qu'une seule ancre dominante, celle-ci reflétant les habiletés, les valeurs et les besoins fondamentaux privilégiés par une personne au cours de sa carrière. Un tel phénomène de dominance, souvent opérationnalisé en identifiant l'ancre ayant obtenu le score le plus élevé chez un individu, est appelé « différenciation ». Récemment, plusieurs chercheurs ont remis en question la différenciation. Selon Martineau, Wils et Tremblay (2005), certains individus intériorisent en fait plusieurs ancrés élevés, ce qui fait référence à « l'indifférenciation ».

Contrairement au modèle de Schein, celui de Feldman et Bolino (1996) aide à comprendre l'indifférenciation parce qu'il repose sur une structuration des ancrés organisée selon une dynamique octogonale. En effet, il existerait une proximité de certaines ancrés dites « compatibles » (ancrés connexes de l'octogone) ainsi qu'une opposition entre d'autres ancrés dites « incompatibles » (ancrés diamétralement opposés de l'octogone). L'idée de structuration des ancrés selon une dynamique circulaire est théoriquement intéressante, car elle pourrait expliquer pourquoi un individu n'afficherait que quelques ancrés dominantes données. Vu que la justification avancée par Feldman et Bolino pour articuler les ancrés ne découle pas d'une preuve empirique probante, leur modèle a

besoin d'être peaufiné d'un point de vue théorique en faisant appel à un autre modèle de structuration. Les ancrs étant essentiellement des valeurs qui guident les décisions de carrière et, par le fait même, l'évolution de la carrière et du travail des individus, il est logique de mobiliser le modèle de structuration des valeurs de Schwartz. En particulier, un modèle de structuration circulaire des ancrs émerge d'un parallèle entre les valeurs et les ancrs de carrière.

Plusieurs études empiriques ont montré soit des corrélations positives, soit des corrélations négatives entre des ancrs de carrière. Sans un modèle de structuration circulaire des ancrs, il devient difficile d'interpréter ces corrélations d'autant plus qu'elles proviennent de données n'ayant pas été normalisées sur une base individuelle comme le recommande Schwartz (1992). Aussi l'objectif de cette étude est-il de vérifier l'existence d'une telle structuration des ancrs en mettant à jour la dynamique corrélacionnelle entre les ancrs. Pour ce faire, cette recherche a adopté la méthodologie développée par Schwartz. Les données, qui proviennent d'un échantillon de 880 ingénieurs québécois, sont soumises à des analyses multidimensionnelles (de type SSA « Smallest Space Analysis » de Guttman-Lingoes, disponible uniquement avec SYSTAT) ainsi qu'à des analyses corrélacionnelles (SPSS) afin de vérifier six hypothèses.

Les résultats des analyses multidimensionnelles sont représentés sur une carte composée de quatre quadrants. Un premier quadrant correspond au pôle « affirmation de soi ». Ce quadrant regroupe des items reliés aux domaines du pouvoir (richesse, autorité, pouvoir social et reconnaissance sociale) et d'accomplissement (réussite, influence). Ainsi, l'ancre de gestion et l'ancre d'identité font partie d'une même famille d'ancres managériales. Opposé à ce quadrant, se situe le domaine associé au pôle « dépassement de soi » composé des items reliés au domaine de la quête de savoir (ancre de compétence technique) et de la bienveillance (ancre service/dévouement à une cause). D'autre part, deux autres quadrants s'opposent. Un troisième quadrant rassemble l'item associé au domaine de la sécurité (ancre de sécurité) auquel s'ajoute les items ayant trait à la QVT, aux conditions de travail et au climat de travail (ancre style de vie); il s'agit donc du pôle « continuité ». Enfin, un quatrième quadrant, celui de l'ouverture au changement, englobe des items reliés à l'auto-orientation (ancre de créativité) et à la stimulation (ancre de défi) auxquels s'ajoutent les items reliés au changement d'emploi, au changement géographique et au changement de projet. De ces résultats il en découle que les quatre premières hypothèses reçoivent un fort appui empirique.

Les deux dernières hypothèses de cette étude portent sur la dynamique corrélacionnelle. À partir des items identifiés dans chacun des quadrants, quatre variables composites ont été calculées après avoir normalisé les données par individu. Ces quatre variables correspondent aux quatre pôles, à savoir l'affirmation de soi, le dépassement de soi, l'ouverture au changement et la continuité. L'analyse corrélacionnelle au niveau axial indique que le pôle « affirmation de soi » est négativement corrélé au pôle de dépassement de soi ($r = -0,44$ significatif à $p < 0,01$) tandis que le pôle « ouverture au changement » est négativement corrélé au pôle « continuité » ($r = -0,49$ significatif à $p < 0,01$). Les hypothèses 5 et 6 sont donc vérifiées.

Cette recherche apporte une contribution importante au domaine des carrières en proposant un modèle original de structuration des ancrs de carrière qui est non seulement décliné selon une logique théorique (la structuration des valeurs de Schwartz), mais aussi vérifié par une preuve empirique probante. Les résultats de cette étude

millitent en faveur de la thèse de l'indifférenciation et suggèrent une reconceptualisation du concept « d'ancres de carrière ». En effet, plusieurs auteurs ont avancé l'idée que certaines ancres se repoussent alors que d'autres s'attirent. Ce phénomène de répulsion et d'attraction, qui fut expliqué dans Martineau, Wils et Tremblay (2005), a été vérifié par la dynamique corrélacionnelle au niveau axial présentée dans cette recherche.

Il est important de souligner qu'une limite de cette recherche a trait à la spécificité de l'échantillon qui se compose uniquement d'ingénieurs. D'autres recherches sont requises afin de pouvoir généraliser nos résultats à d'autres professions. De plus, la construction et la validation d'un nouvel instrument de mesure est essentiel pour l'avancement des connaissances sur les ancres de carrière, du fait que les instruments de mesure actuels, ne mesurent pas adéquatement les ancres de carrière.

MOTS-CLÉS : ancres de carrière, valeur, ingénieur, structure corrélacionnelle, analyse des similarités

RESUMEN

Hacia una estructuración de los anclajes de carrera: una investigación empírica sobre los ingenieros

Contrariamente a la teoría de anclaje de carreras de Schein, que se queda en el campo de un anclaje único de carrera, el presente estudio propone una estructura de anclaje de carrera original que incluye múltiples anclajes dominantes. El análisis de datos a partir de una muestra de 880 ingenieros de Quebec sostiene esta re-conceptualización basada en un modelo circular de anclajes de carrera. Las nuevas dinámicas de anclaje de carrera muestran que varios anclajes son complementarios (por ejemplo, creatividad y reto) mientras otros son conflictivos (por ejemplo, reto y seguridad). En particular, el análisis de correlación al nivel axial indica que el polo "auto-mejora" (dedicación a la causa, competencia técnica) está en correlación negativa con la "auto-trascendencia", mientras el polo "apertura al cambio" (reto, creatividad empresarial) está en correlación negativa con el polo "conservador" (seguridad, estilo de vida). Estos resultados pueden llevar a otras investigaciones sobre la carrera de gestión.

PALABRAS CLAVES: anclaje de carrera; valores, ingeniero; estructura de correlaciones; análisis multidimensional