

Effect of Age upon Leadership Attributes from Recruitment Instrument: A Selective Developmental Trajectory

Trevor Archer^{1*}, Bengt Jansson^{1,2}, and Klaus Olsen²¹Psykologiska Institutionen, Göteborgs universitet, Box 500, 405 30 Gothenburg, Sweden²JobMatch Talent, JobMatch Sweden AB, Skårs Led 3, Box 14001, S-400 20 Gothenburg, Sweden

Abstract

This exploratory report presents the contents of a large data-base consisting of psychometric measurement of personality-related attributes of individuals who underwent the recruitment process by completing the JobMatchTalent instrument that was developed from principles of occupational psychology. On the basis of individuals', who applied for corporate or governmental leadership positions, responses, the correlations between applicants' age and personal attributes was obtained. Correlational and regression analyses were used to explore differences between younger and older potential executive participants. These indicated that younger leadership applicants enjoyed an advantage with regard to: "Focus-on-details", "Focus-on-order", "Own motivation", "Concentration", "Will-power", "Winner-instinct", "Visions-for-the-future", whereas older leadership applicants enjoyed an advantage with regard to: "Sphere-of-influence", "Tolerant attitude" and "Trust-in-others". The levels of stress-sensitivity, strategic focus, energy and communication, as expressed by younger and older recruitment applicants seeking executive positions, were comparable. At higher age levels, the leadership candidates expressed less focus on the tasks and less orientation towards their own ambitions but were rather more concerned with developing their staff, building relations and 'team-spirit'.

Keywords: Recruitment; Leadership; Attributes; Younger; Older; Participants

Introduction

Recruitment, the search and selection employees to fill selected job vacancies, applies a strategy designed to identify applicants that measure up to the particular company/administration/governmental requirements and values; this selection becomes more critical in the search to fill leadership posts. Effective and selective recruitment operators employ various types of personality assessment instruments and testing of attributes to enhance their decision-making concerning the potential of applicants and potential employees, particularly with regard to leadership characteristics [1]. Personality test and assessment instruments that utilize eventual employees' personal attributes, leadership qualities and responses to stress have been the focus of analysis for some time [2]. Nevertheless, the accessibility and viability of 'recruitment instruments' seems generally to be fraught with pitfalls. Assessments of personality have been defined traditionally along the lines of "factors" incorporating genetically influenced dispositions and interpersonal strategies associated with individuals' behaviors [3]. In a study comparing several psychological screening instruments used for recruitment purposes in selecting police officers and employees in safety services [4], examined critically and evaluated the comparative validities of these instruments which included the Minnesota Multiphasic Personality Inventory (MMPI), the California Personality Inventory (CPI), the Inwald Personality Inventory (IPI), the Australian Institute of Forensic Psychology's test battery (AIFP), as well as some other less researched tests. They observed that none of these tests displayed unequivocal research support and, indeed, it was likely that several screening instruments added minimal value; they were deemed unsuitable. Faulty selection of test instruments ought to exert disadvantageous implications for policy and practical efficacy during the recruitment process.

JobMatchTalent Instrument

Olsen [5] developed the JobMatchTalent test in collaboration with a

group of recruitment consultants who wanted a test especially adapted to the needs that arose in their work. It is an instrument developed to measure individuals' occupation-related characteristics (attributes) in order to match these attributes against specific demands related to specific occupations and positions within them. He utilized panels of experts as consultants (e.g., managers, recruiters) and workers to obtain input during the early developmental stages of the JobMatchTalent test (for a description of this procedure, called "relevance check", see [6]). This approach is important when tests are constructed to avoid questions that are only theoretically based (see [7], who criticized solely theoretically based instruments). In order to select suitable occupation-related personality traits, Olsen (personal communications, used various established instruments of measuring personality characteristics, such as: the Myers-Briggs Type Indicator, a test that measures the different psychological types based on Jung's notions [8], the Sixteen personality factor Questionnaire, an instrument that measures 16 personality traits derived from factor analysis [9], the Minnesota Multiphasic Personality Inventory, an instrument that identifies the structure of personality and psychopathology [10], and the NEO PI-R [11]). JobMatchTalent test has been developed continuously to conform optimally with the requirements of corporations/institutions, managers and recruiters in the advancement of personnel-related issues. The test has been certified by DNV GL (Det Norske Veritas and Germanischer Lloyd, Norwegian and German Authorities, respectively) certification body

***Corresponding author:** Archer T, Department of Psychology, University of Gothenburg, Box 500, S-405 30 Gothenburg, Sweden, Tel: +46 31 7864694; E-mail: trevor.archer@psy.gu.se

Received: November 02, 2015; **Accepted:** November 05, 2015; **Published:** November 30, 2015

Citation: Archer T, Jansson B, Klaus Olsen (2015) Effect of Age upon Leadership Attributes from Recruitment Instrument: a Selective Developmental Trajectory. Clin Exp Psychol 1: 106. doi:[10.4172/cep.1000106](https://doi.org/10.4172/cep.1000106)

Copyright: © 2015 Archer T, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

and classification body in accordance with the European Federation of Psychologists' Association test standards. The instrument consists of three areas/domains that provide a broad picture of the individual's characteristics. These domains are called Stability Patterns, Action Patterns, and Relationship Patterns. These areas are divided into 10 main scales, which in turn comprises 30 sub-scales measuring work related traits that provide a deeper picture of the worker. The 10 main scales are: Work Structure, Inner Drive, Stress Index, Decision Characteristics, Activity, Drive, Acting, Tolerance, Social Interest, Communication (See Table 1 for descriptions of each scale and its sub-scales). The JobMatchTalent recruitment instrument has been investigated in leadership estimation and correlational tests against other instruments, such as the NEO PI-R dimensions [12]. The NEO PI-R dimensions instrument selects markedly specific attributes; for example, in a study of emergency nurses, it was shown that this occupational category scored higher than population norms in the domains of Extraversion, Openness to experience and Agreeableness, and in twelve facets, that included excitement-seeking and competence [13]. The JobMatchTalent has been employed for over a decade to test more than 30,000 employees' occupational psychology attributes, of which over 9,000 individual-tests pertained to leadership positions, in each recording background details such as age and gender. This database has provided the basis of analyses that examine the influence of age upon the responses of individuals recruited for executive leader appointments.

According to the self-reported judgements of the individuals' own attributes that were presented in Table 1, it may be possible to derive several general conclusions with regard to the presumptive executive leaders' development over advancing age (i.e. from a 30-40 to a 50-60 years age-grouping). These pertain to: (i) the differences between the attributes of younger and older leaders, (ii) changes in expressions of attributes over the lifespan, and (iii) those attributes unchanged over aging. The age-dependent attributes may be divided into three sections: those related to "job-focus" (JobMatch factors: B2, B3, C1, C2), "momentum" (i.e. upward-propulsion) (D2, F1, F2, G2) and "cooperativeness" (H2, H3). The present results imply that attributes relating to "job-focus" and "momentum" tend to decrease with increasing age whereas those relating to "cooperativeness" increase. Those attributes, that appear age-independent, may be broken down into four sections, namely: attributes linked to (a) "stress-sensitivity" (B2, B3, C1, C2), "focus-on-strategy" (A1, D1), "energy" (E1, E2, E3,

G3) and "communication" (H1, I1, I2, I3, J1, J2).

The purpose of the present study was to examine the responses to the JobMatch instrument from 6,789 executive leaders, drawn from the accumulated "norm-database", in order to ascertain whether or not younger (30-40 years) executives expressed attributes that differed in extent from those expressed by older (50-60 years) executives, and whether or not these attributes may be enhanced or diminished.

Method

Participants

Participating leaders (N = 6,789) were selected from a norm group for the personality-related inventory JobMatchTalent (JMT). The purposes advanced for individuals seeking executive positions to take the test were either with regard to recruitment, career advice, or for development or training although those included here had applied for leadership positions. The mean age of the executive leader applicants was 43.6 years (SD = 9.34). The gender distribution was 39% women (N = 2658) and 61% men (N = 4131). Most executive leaders were engaged in private company, i.e. corporate enterprises, occupations.

Instrument

Personal attributes and perception of job characteristics were measured with JobMatchTalent (JMT). The JMT test consists of ten main scales, where each main scale has three subscales (range 10-110). The scales (A-J) have the following descriptions: Work Structure (A: Focus-on-planning, Focus-on-details, Focus-on-order), Personnel Drive (B: Own-motivation, Optimism, Humor-equilibrium), Stress-index (C: Self-control, Resilience, Concentration), Decision characteristics (D: Thoughtfulness, Will-power, Stamina), Activity (E: Physical-activity, Psychological-activity, Need-for-speed), Drive (F: Winner-instinct, Visions-for-the-future, Motivation-to-develop), Acting (G: Sphere-of-influence, Initiative, Willingness-to-take-risks), Tolerance (H: Assent-image, Tolerant-attitude, Trust-in-others), Social interest (I: Showing-consideration, Diplomacy, Reaching-out), and Communication (J: Impact, Communication, Openness).

Statistical procedures

The age of leaders was regressed on the subscales of JMT by use of standard multiple regression. However, due to the large sample size, also predictors with a small impact on age would have a significant contribution. Effect sizes were analysed in order to reduce these influences on the regression model. Pearson product moment correlations between age and the JMT subscales were evaluated using Cohen's correlation ($r=.10$) for a small effect size [14]. Correlations not reaching a small effect size were not included for regression analysis.

Furthermore, the homogeneity of covariances among age of the leaders and JMT subscales was controlled for by use of ribbon band plots. For values below 30 and above 60 years of age, there were fairly large fluctuations for most of the plots. Those fluctuations disappeared by restricting age to 30-60 years. Due to the restriction of age, the sample size decreased with 650 persons (N = 6139). On average, the restricted age increased by 0.7 years (M = 44.3), and the standard deviation decreased by 1.4 years (SD = 7.95). In addition, the interpretation of the regression analysis was supplemented with a comparison of end groups: 30-40 vs. 50-60 years of leaders' age. The comprehension of the age effects related to the JMT scales is facilitated by often used group mean values.

JMT subscales related to Age	Unstd B	Pearson's Mean difference for age groups:	
		r '30-40' (n=2184) (n=1782)	vs '50-60'
Focus-on-details	-.019	-.17	9.63
Focus-on-order	-.037	-.17	9.6
Own-motivation	.013 (ns)	-.16	6.23
Concentration	-.039	-.14	6.29
Will-power	-.004 (ns)	-.11	5.12
Winner-instinct	-.080	-.20	9.94
Visions-for-the-future	-.043	-.13	5.83
Sphere-of-influence	0.102	0.16	-6.78
g2Initiative	-.042	-.11	5.8
Tolerant-attitude	0.005	0.18	-8.36
Trust-in-others	.012 (ns)	0.11	-5.09

Table 1: Relationships among leader's age and JMT subscales (N=6139) *Notations:* JMT=JobMatchTalent; Unstd B= unstandardized regression coefficients; r=correlation coefficient. *Note.* Correlations were selected to have at least a small effect size ($r=.10$). All regression coefficients, correlations and mean differences were significant at $p<.001$ if not otherwise stated.

Results

Eleven correlations among the age of leaders and the JMT subscales exceeded the small effect value ($r=.10$). The selected correlations ranged in absolute values between .11 and .20 ($N = 6139$). It should be emphasized that the restriction of leaders' age to 30-60 years only marginally changed the correlations among age and the JMT subscales.

The regression analysis explained 16.1% (adjusted) of the variance of leaders' age [$F(11,6127)=108.2, p<.001$]. Eight of the eleven predictors of leaders' age were significant ($p<.001$). Two of these were positive (Sphere-of-influence, Tolerant-attitude), while six of them were negative (Focus-on-details, Focus-on-order, Concentration, Winner-instinct, Visions-for-the-future, Initiative).

The computation of predictor importance as proportions of explained variance excluded three subscales (out of eleven) as non-significant (Own-motivation, Will-power, Trust-in-others). The far most important predictor was Sphere-of-influence that was about three times as important as the next largest predictor Winner-instinct. See further Figure 1 for a more detailed overview.

Moreover, the mean differences between younger (30-40 years) and older leaders (50-60 years) ranged from between 5 to 10 (i.e. about 5-10% of the range of a JMT scale, see Table 1 for a detailed overview). It should be noted that the regression coefficients and the mean differences in Table 1 were highly related ($r=.80$). This relationship would have been even higher if not there had been couple of (weak) suppression effects (for Own-motivation and Will-power).

Furthermore, the mean ratings of the selected JMT subscales were about 60-65 with four exceptions: Focus-on-order ($M = 77$), Sphere-of-influence ($M = 72$) Tolerant-attitude ($M = 72$), Trust-in-others ($M = 81$). For all eleven subscales, the standard deviations ranged between 17-25 scale units.

As to the group differences, note that three attributes, i.e. sphere-of-influence, tolerant attitude and trust-in-others developed progressively as the executive grew older. Eight attributes, on the other hand, i.e. focus-on-detail, focus-on-order, own-motivation, concentration, will-power, winner-instinct, visions-for-the-future and initiative decreased progressively implying these individuals may have developed a more 'collective' outlook. The shape of the selected relationships was shown in band plots. All plots had a characteristic jagged linear form. This pattern confirmed the high correlation, as mentioned above, between regression coefficients and the corresponding group mean differences between younger and older leaders.

Relationships among age of leaders and JMT subscales were categorized in three figures. In Figure 2a, age was positively related to work structure and stability, respectively. In Figure 2b, age was negatively related to tolerance and acting, respectively, and in Figure 2c, age similarly was related to drive and acting.

Discussion

Eleven attributes (scales) provided relevant age-related effects (increasing/decreasing) among the executive leaders:- three leadership attributes increased with age: "(+g1) Sphere-of-influence", "(+h2) Tolerant attitude" and "(+h3) Trust-in-others", whereas eight leadership attributes decreased with age: "(-a2) Focus-on-details", "(-a3) Focus-on-order", "(-b1) Own motivation", "(-c3) concentration", "(-d2) Will-power", "(-f1) Winner-instinct", "(-f2) Visions-for-the-future" and "(-g2) initiative" (the letters of the alphabet are linked to the factors within the JobMatchTalent instrument, numbers refer to attributes and

the +/- signs refer to age-dependent increases/decreases, respectively). Nevertheless, a major proportion of the attributes indicated that the responses were independent of age, including "focus-on-planning", "optimism", "humor-equilibrium", "self-control", "resilience", "thoughtfulness", "stamina", "physical activity", "psychological activity", "need-for-speed", "motivation-to-develop", "initiative", "willingness-to-take-risks", "assent-image", "showing-consideration", "diplomacy", "reaching-out", "impact", "communication" and "openness".

Those attributes that were found to be sensitive to the passage of age may be discussed according to whether or not they developed with age or whether they declined. Three attributes developed with higher age levels: "Sphere-of-influence", "Tolerant attitude" and "Trust-in-others". An increase in "Sphere-of-influence" was expected since experience and the use of influence ought to be improved and implies that older leaders have acquired more experience in leading projects, estimating logistics, enlarging horizons and a greater knowledge of the concern than younger leaders [15] found that age per se may not be critical but experience of the job exerts an important influence. Increased "Tolerant attitude" implies that older leaders develop a more tolerant attitude to their employees and place a greater weight on listening to them and considering their opinions. These leaders seek 'togetherness' and work to create unity within the group whereas **younger leaders** pay less attention to others' viewpoints instead focusing more on implementing their own ideas and initiative. Modern leadership coaching sets a premium on 'tolerance' and 'persistence' at the workplace [16]. "Trust-in-others" which develops with age may be interpreted reflecting younger leaders' lack of trust in others in comparison with that shown by older leaders who dare to give more space/leeway to employees than the younger ones dare to. This situation may lead in turn to older leaders' greater ability to delegate responsibility with less need for control in association with organizational behavioral science principles that advance the notion of delegation, but not "dumping" [17].

Eight executive leadership attributes were shown to decrease with age: "Focus-on-details", "Focus-on-order", "Own motivation", "concentration", "Will-power", "Winner-instinct", "Visions-for-the-future" and "initiative". Reduced expression of "Focus-on-details" may imply that older executives have developed a broader 'bird's-eye view' to perceive the 'bigger picture' whereas younger ones focus more on detail. The greater "Focus-on-order" expressed by younger executive may reflect greater need for structuring and organizing the operations/

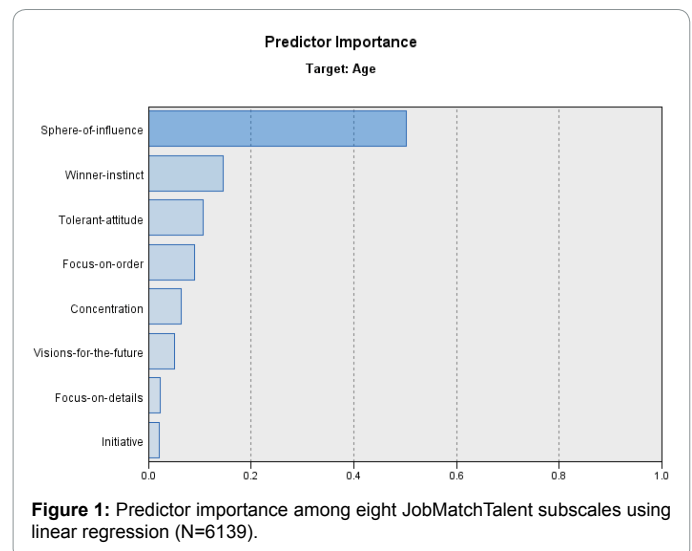
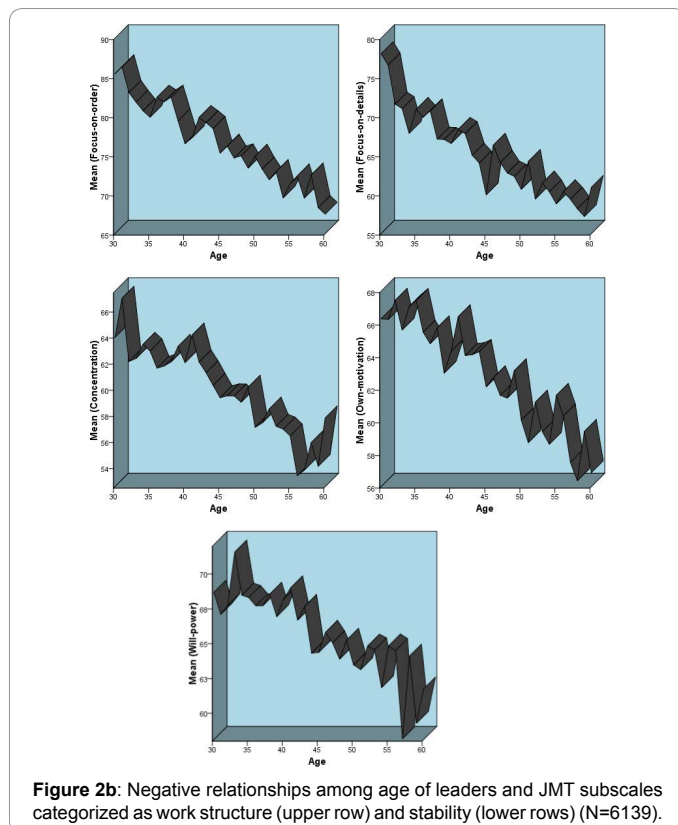
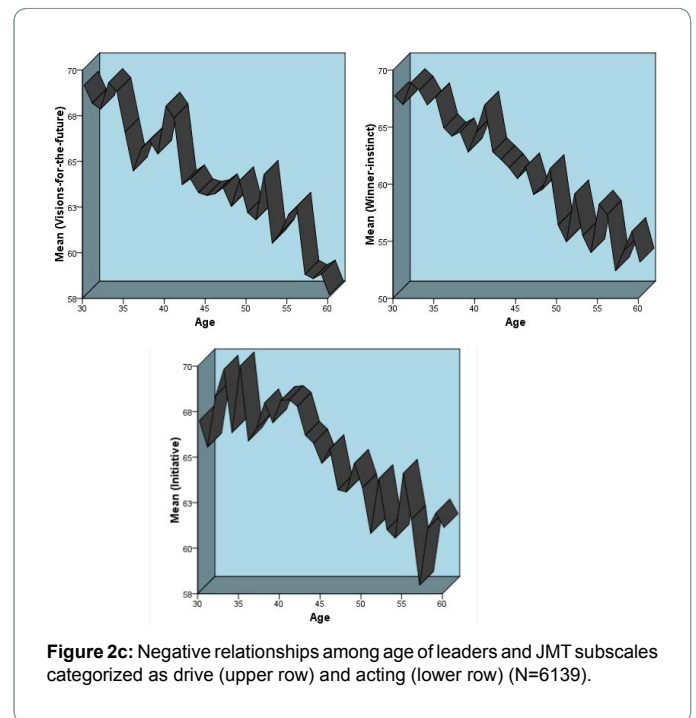
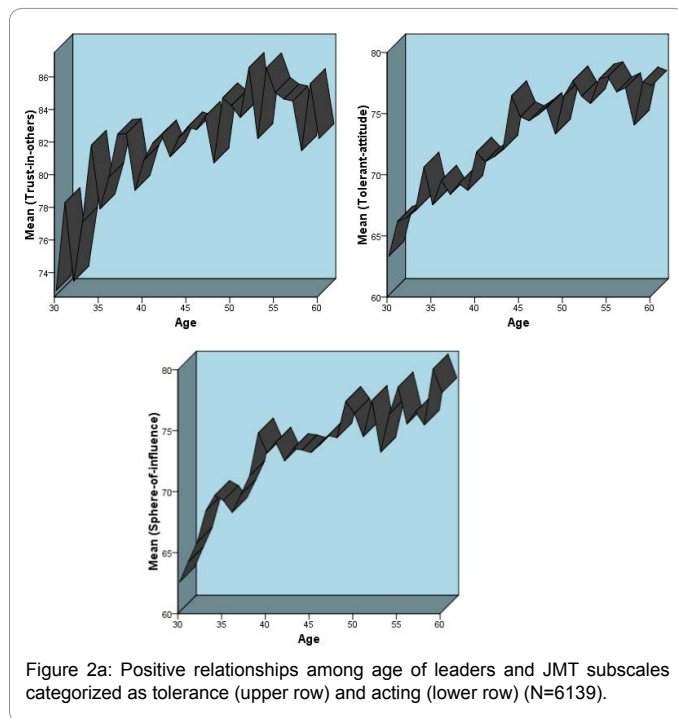


Figure 1: Predictor importance among eight JobMatchTalent subscales using linear regression (N=6139).



tasks with construction of routines while older ones focus upon ‘team-spirit’. ‘Own motivation’ decreased with age: it appears that younger executives can maintain motivation, even under setbacks, concomitant with a desire to confirm performance which fits with their elevated ‘Winner-instinct’ whereas the older ones appear not to share this need

and are able to ‘stand-back’. “Concentration” diminished with age: It seems the case the leadership develops from greater concentration upon single items to more ‘lateral’, selective task-related and context-related attention. Older human brains retain the capacity to change in response to experience until late adulthood and fits with the principle of experience-dependent neuroplasticity [18]. “Will-power” and “Winner-instinct” also abated with age: it seems more important for younger executives to be perceived as ‘decisive’ than the older ones. Nevertheless, higher levels of “Will-power” and “Winner-instinct” may come at a price since excessive application of these attributes implies stubborn and over ambitious pursuit of one’s agenda at the cost of being receptive to other arguments and points-of-view [19]. Over time, a less prestige-oriented and career-oriented, self-effacing style of leadership progresses wherein the opinions of and ‘room’ for others are welcomed to a greater extent. Older executives place a higher priority upon seeing colleagues develop. Levels of “Visions-for-the-future” and “initiative” diminished with higher age-groups: younger executives expressed more interest in presenting visions and goals to strive for. It seems likely that, over time, a more earthbound and team-building leadership style, with a lower level of risk-taking, may develop wherein the collective performance overrides individual performance. As indicated above, the vast majority of attributes, i.e. attributes indicated that the responses were independent of age, including “focus-on-planning”, “optimism”, “humor-equilibrium”, “self-control”, “resilience”, “thoughtfulness”, “stamina”, “physical activity”, “psychological activity”, “need-for-speed”, “motivation-to-develop”, “initiative”, “willingness-to-take-risks”, “assent-image”, “showing-consideration”, “diplomacy”, “reaching-out”, “impact”, “communication” and “openness”, were unaffected by executives’ age. Several of these indications are contrary to what may be expected: e.g. that both age-groups had similar levels of strategic focus since in triathlon competitions the younger, 40-44 years, group showed better strategic pacing than the older, 65-69 years [20], or stress-sensitivity since fatigue which regulates stress is age-dependent [21]. Similarly, it was expected that “resilience”, “stamina”, “physical activity”, “psychological activity”, “need-for-speed”, “motivation-to-

develop”, “initiative”, “willingness-to-take-risks”, “assent-image”, and “impact” would decrease with advancing age but this expectancy was not borne out by the results. Furthermore, “thoughtfulness”, “showing-consideration”, “diplomacy”, “reaching-out”, and “openness” did not increase with age. Table 2 presents a summary of characteristics that emerge from the attributes expressed by younger and older executive leaders. Note that “stress-sensitivity”, “focus-on-strategy”, “energy” and “communication” were similar among younger and older executives.

Although the Big-Five personality test [22-24] has implied that a sufficient basis for application in recruitment purposes [25], factor analysis indicated disadvantages in the screening of personnel due to emergence of a ‘sixth’ factor linked to individuals’ prior conceptions of ‘the job’ [26,27]. In a comparison between the JobMatchTalent test and the NEO PI-R dimensions, it was found that four of those dimensions were explained by: (i) Work structure and decision characteristics implying measures of thoughtfulness, planning, order and attention to detail (conscientiousness), (ii) inner drive, activity, drive, acting and communication implying out-going and extroverted, (iii) tolerance and social interest linked to individuals’ interest and ability to establish social relations (agreeableness), and (iv) stress index associated with emotional stability as an opposing attribute to neuroticism. Conscientiousness, in itself, converges on order and structure, work-productivity and work ethic, and low absenteeism [28-30]. At the workplace, the influence of leadership upon sphere-of-influence has been centred upon two central aspects (a) at an individual level, involves the affect, feelings and attitudes that modulate behavioral, psychological and social domains, and (b) at an organisational level, involves the cultural, leadership, decision-making and strategic implementation of goals. The attribute, sphere-of-influence, was observed to present the single most important attribute representing leadership expression (see Figure 2), which confirms the centrality of this notion.

Limitations

In self-report analyses for recruitment purposes, the proclivity of participants for manipulation of their responses to items describing their personal attributes, in order to render themselves in a more positive light must be taken into consideration [31]. Furthermore, it was found that new managers’ cognitive abilities were correlated positively with their perceptions of the job-relatedness of selection procedures [32]. This observation suggests that recruitment self-report instruments ought to be combined with some type of interview procedure.

Conclusions

The present study, applying the JobMatchTalent recruitment instrument, highlighted the differences between the attributes of younger and older leaders, changes in expressions of attributes over the lifespan, and those attributes that were unchanged over twenty years of aging. The basic difference between the responses of younger and older executives’ responses appears to be that while the former tend to express a self-orientation the latter express a team-orientation. Within respective executive organizations, the present study proposes that individuals develop identifiable ‘strategies’ that either produce advantages through the career stages or not; the attributes defining older executives subtend a developmental trajectory defined by a strategy based upon an “all-for-one-and-one-for-all” notion that draws together employees in team-spirit and ‘cushions’ any eventual occupations mishaps. Nevertheless, one may presume that both orientations in suitable combinations ought to provide the strongest possibility of successful enterprise.

Younger executives	Older executives
Detail control and organising	Bird’s-eye view and ‘wholeness’
Pursue own initiative	Provide space for others’ initiative
Control and monitor projects and results	Delegate responsibility, encourage
Process-driven result-production	Team-driven result-production
Self-based decision-making	Feedback-based decision-making
Self-hub for results and initiative	Team-hub for results
Creates visions and goals	Creates team unity to achieve goals

Table 2: Observed characteristics that differed between younger and older executives’ responses to the JobMatch instrument.

References

1. Roberts-Turner R, Hinds PS, Nelson J, Pryor J, Robinson NC, et al. (2014) Effects of leadership characteristics on pediatric registered nurses’ job satisfaction. *Pediatr Nurs* 40: 236-241.
2. Ryan SA, Walker PH (1988) The challenge for innovation: a new leadership. *J Prof Nurs*. 4:148-230.
3. MacKinnon DW (1944) The structure of personality. In J McVicker Hunt (Ed.), *Personality and the Behavior Disorders* (Vol. 1, pp. 3-48), New York, Ronald Press.
4. Lough J, Von Treuer K (2013) A critical review of psychological instruments used in police officer selection. *Policing: An International Journal of Police Strategies & Management* 36: 737-751.
5. Olsen K (2013) *JobMatchTalent technical manual*. Gothenburg: JobMatch, Sweden.
6. Davis LL (1992) Instrument review: Getting the most from a panel of experts. *Appl Nurs Res* 5: 194-197.
7. Coyne JC, Gottlieb BH (1996) The mismeasure of coping by checklist. *J Pers* 64: 959-993.
8. Myers LB, McCaulley MH (1985) *Manual: A guide to the development and use of the Myers- Briggs Type Indicator*. Palo Alto, CA: Consulting Psychologists Press. 420p.
9. Cattell HE, Mead AD (2008) The sixteen personality factor questionnaire (16PF). In: Boyle G, Matthews DH, Saklofske, (eds). *The SAGE handbook of personality theory and assessment*. Vol. 2 *Personality measurement and testing*. Los Angeles, CA: Sage pp: 135-178.
10. Hathaway SR, McKinley JC (1943) *Manual for the Minnesota Multiphasic Personality Inventory*. New York: Psychological Corporation.
11. Costa PTJr, McCrae RR (1992) *NEO PI-R professional manual*. Odessa, FL: Psychological Assessment Resources. Inc. 101 p.
12. Garcia D, Nima AA, Rappe C, Rapp Ricciardi M, Archer T (2014) The relationship between the JobMatchTalent test and the NEO PI-R: construct validation of an instrument designed for recruitment of personnel. *PLoS One* 9: e90309.
13. Kennedy B, Curtis K, Waters D (2014) The personality of emergency nurses: is it unique? *Australas Emerg Nurs J* 17: 139-145.
14. Cohen J (1988) *Statistical power analysis for the behavioral sciences* (2nd edition). Hillsdale, New Jersey: LEA.
15. Eweje G & Brunton M (2010) “Ethical perceptions of business students in a New Zealand university: Do gender, age and work experience matter?” *Business Ethics. A European Review*, Vo.19 No.1, pp.95-111.
16. Little JW (1982) Norms of collegiality and experimentation: workplace conditions of school success. *Am Educ Res J* 19: 325-340.
17. Dow AW, DiazGranados D, Mazmanian PE, Retchin SM (2013) Applying organizational science to health care: a framework for collaborative practice. *Acad Med* 88: 952-7.
18. Leung NT, Tam HM, Chu LW, Kwok TC, Chan F et al. (2015) Neural Plastic Effects of Cognitive Training on Aging Brain. *Neural Plast* 2015: 535618.
19. McGonigle K (2012) *The Willpower Instinct. How self-control works, why it matters, and what you can do to get more of it*. Avery Publishers, London.
20. Knechtle B, Rosemann T, Zingg MA, Stiefel M, Rüst CA (2015) Pacing strategy

- in male elite and age group 100 km ultra-marathons. *J Sports Med* 6: 71-80.
21. Lin WQ, Jing MJ, Tang J, Wang JJ, Zhang HS et al. (2015) Factors Associated with Fatigue among Men Aged 45 and Older: A Cross-Sectional Study. *Int J Environ Res Public Health* 12: 10897-909.
 22. Fisher HE, Island HD, Rich J, Marchalik D, Brown LL (2015) Four broad temperament dimensions: description, convergent validation correlations, and comparison with the Big Five. *Front Psychol* 6: 1098.
 23. Garbarini F, Boero R, D'Agata F, Bravo G, Mosso C, et al. (2014) Neural correlates of gender differences in reputation building. *PLoS One* 9: e106285.
 24. Lounsbury JW, Foster NA, Levy JJ, Gibson LW (2014) Key personality traits of sales managers. *Work* 48: 239-53.
 25. Hogan R, Hogan J, Roberts BW (1996) Personality measurement and employment decisions: questions and answers. *Amer Psychol* 51: 469-477.
 26. Cellar DF, Miller ML, Doverspike DD, Klawnsky JD (1996) Comparison of factor structures and criterion-related validity coefficients for two measures of personality based on the Five Factor model. *J Appl Psychol* 81: 694-704.
 27. Klehe UC, Kleinmann M, Hartstein T, Melchers KG, König CJ, et al. (2012) Responding to personality test in a selection context: the role of the ability to identify criteria and the Ideal-Employer Factor. *Hum Perform* 25: 273-302.
 28. DeYoung CG, Quilty LC, Peterson JB (2007) Between facets and domains: 10 aspects of the Big Five. *J Pers Soc Psychol* 93: 880-896.
 29. Higgins DM, Peterson JB, Lee A, Pihl RO (2007) Prefrontal cognitive ability, intelligence, Big Five personality and the prediction of advanced academic and workplace performance. *J Pers Soc Psychol* 93: 298-319.
 30. Salgado JF (1997) The five factor model of personality and job performance in the European Community. *J Appl Psychol* 82: 30-43.
 31. Zickar MJ, Robie C (1999) Modeling faking good on personality items: an item-level analysis. *J Appl Psychol* 84: 551-563.
 32. Smither JW, Reilly RR, Millsap RE, Pearlman K, Stoffer RW (2006) Applicant reactions to selection procedures. *Personnel Psychol* 46: 49-76.