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Motivation and Successful Aging.

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Motivation and Successful Aging

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Introduction

An important model for successful aging includes the ability to avoid disease, maintain high cognitive and physical function, and have strong social engagement in life (Rowe and Kahn 1997). Maintaining healthy disease-free state includes genetically determined intrinsic factors, lifestyle dependent environmental influences, and the ability for an individual to personally modify their experiences for a more positive outlook on life. Cognitive and physical function addresses the potential for an individual to have these traits, but life engagement addresses the productivity of the individual in life and in context of social interactions. Other important factors are positive outlook, well-being, and subjective self-determined successful aging which are all closely linked (Depp and Jeste, 2009) Self-reported successful aging is demonstrated to predict mortality independent of factors causing disease and disability (Montross 2006). This suggests that there are other factors independent of physical health that influence mortality.

Motivation

Motivation is an important component of successful aging that is often overlooked. It determines activity and decision making that define everyday function. Research has linked motivation with positive affect and vitality (Sheldon, Ryan and Reis 2001) and provides a measure of self-regulation (Guay, Vallerand and Blanchard 2000). Intrinsic motivation as described by E. Deci and R. Ryan implies a completion of activities for the pleasure or satisfaction derived from doing them, while extrinsic motivation occurs when there is an outside reward (Decid & Ryan 1985). Alternatively, amotivation can occur when an individual does not obtain personal mastery and competence with an activity and therefore ceases to believe in an internal or external reward (Deci 1971.) Motivation answers why we participate in certain behavior and change behavior for certain activities based on external forces (Deci & Ryan 1985).

The goal of this research was to derive a motivation scale from an ongoing cohort study of aging the Successful Aging and Geriatric Evaluation (SAGE) (Jeste et al. (numerous citations). Although a motivation scale per se was not directly employed in this study, the focus was in identifying items or subscales that could theoretically and empirically constitute a motivation scale study. (Jorm et al. 1998). There are a number of scales that measure motivation and have been studied longitudinally. The Behavioral Inhibition System/ Behavioral Approach System - BIS/BAS is a four-factor scale including BIS, BAS reward responsiveness, BAS drive, and BAS fun seeking. It is used to study goal-directed behavior toward positive and away from negative emotion (Carver and White 1994). The BIS scale is useful because it is able to score the propensity for anxiety rather than anxiety in a particular situation. The four factors have significant internal consistency and are considered a valid scale for its four factors of motivation

(Jorm et al. 1998). The Getting out of Bed Scale is used to test for motivation and life outlook using familiar everyday activities (Clough-Gorr et al. 2009). This scale is constructed as a brief assessment for an elderly population providing a model for our motivation scale. This scale has good construct validity, internal consistency, stability over 6-months, and overall psychometric properties, however, it has only been tested in a sample of female breast cancer patients and therefore does not have generalizability. This motivation score is suited for studies geared toward studying overall motivation over a specific experience making it a good model for our purposes. Therefore, the motivation scale we created from SAGE questions was based on BIS/BAS and Getting Out of Bed Scale and association of items to previous theories of motivation.

Factors were created from the scale components that included freedom from negative affect, disempowerment, empowerment, and drive. Freedom from negative affect addresses the emotional component of motivation evaluating pleasure, failure, fear, anger, emotional problems, ability to cope, and nervousness. Factor 1 addresses the individual's capacity to be free of these negative emotions. The relationship between positive affect and motivation has been studied closely and has revealed that happiness precedes behaviors that lead to success (Lyubomirsky 2005). This suggests that freedom from negative affect contributes to motivated behavior. Empowerment is a contributory factor in motivation that measures how the individual perceives his or her own capacity to determine the future. The items in Factor 2 address disempowerment with a focus on lack of control, inability to solve problems, incapacity for change, and helplessness. On the other hand, Factor 3 addresses empowerment. Empowerment has been defined by impact, competence, meaningfulness, and choice which influences proactive behavior and perceived control (Thomas & Velthouse 1990). This factor addresses components of self worth and self-esteem guiding achievement based behavior and motivation for success (Crocker 2001). Empowerment was measured with survey items of confidence, hope for future, competence, and expectation for success. Factor 4 evaluates the concept of drive in motivation. Atkinson developed a drive-habit model of motivation in which behavior is reconciled with a reward to reinforce further behavior and create the drive and purpose for action (Atkinson 1964). Behavior can be defined by a motivational construct from the environment that creates the drive to execute the behavior (Wise 1987). The items for Factor 4 evaluate passivity, anhedonia, and hesitancy of decision-making included in the level of personal drive on the individual

Motivation and reward provide an intriguing basis for the study of successful aging. We hypothesize that there is a significant positive relationship between motivation and successful aging. Furthermore, motivation is a significant predictor of successful aging even after adjusting for social and physical functioning.

Methods:

Study Design and Recruitment

The SAGE study used in this investigation is a structured multi-cohort study of 1,300 randomly selected, community-dwelling residents of San Diego County, aged 50-99 years, with an over-representation of subjects aged 80 and older. Participants were age 50-99 years, all had a telephone at home, and were physically and mentally able to

participate. All participants were given informed consent for study participation, and had conversational and written fluency in English. Participants were excluded if they resided in a nursing home, requiring daily skilled nursing care, had a self-reported prior diagnosis of dementia, or terminal illness or requiring hospice care. The study has been approved by the UCSD Human Research Protections Program.

The California Survey Research Services (CSRS) (<http://www.calsurvey.com/>), assisted in contacting participants for the survey. The CSRS found difficulties in recruiting targeted number of people in their 90s who met all the inclusion/exclusion criteria. To make up for a smaller-than-desired number of people in their 90s (238 instead of 325), we recruited more subjects in the 80s (411 instead of 325). The cohort included 523 participants from the 1,500 subjects based on the number of surveys completed at the time.

Mail-in SAGE Survey

Mail-in survey questionnaires were distributed with range of topics related to successful aging including Connor Davidson Resilience Scale, Hardy Gill Resilience Scale, SF-36 Functional Health and Well Being survey, Philadelphia Geriatric Morale Scale, Cognitive Assessment Screening Test, Test Your Memory, Optimism Scale, Perceived Stress Scale, Wisdom Scale, Personal Mastery Scale, BSI Anxiety, Patient Health Questionnaire (PHQ-9), Cognitive/Leisure/Social Activities. Self-reported successful aging was measured with a one item self-reported successful aging on a scale (1-10). Participants also completed a set of questions describing their demographic background including age, gender, marital status, educations, income, housing, and employment. Community member study design, telephone interview, and mail-in SAGE survey was conducted as previously described (Jeste et al. 2013).

Motivation Scale

The motivation scale was created from 23 items that were selected based on the following criteria: 1) items were congruent with previous theories of motivation; 2) items were based off previous reliable motivation scales. The model of motivation we use consists of factors that separate into the following subgroups: freedom from negative affect, disempowerment, empowerment, and drive. Each factor includes individual items derived from internal components of the SAGE study. These four factors serve to encompass the components of the motivation scale and define motivation with a conceptual model in which our studies are based. The first factor has 7 items congruent with the contribution of positive affect to motivation and includes “little interest or pleasure in doing things”, “feeling bad about yourself, feeling you are a failure”, frequency of fear, anger, limits of physical or emotional functioning, ability to cope, and nervousness. The second and third factors evaluate the contribution of personal mastery and competence that contribute to motivation (Deci 1971). Questions include, “I have little control over the thing that happen to me”, there is no way I can solve some of the problems I have”, “There is little I can do to change the important things in my life” and evaluation of helplessness and being “pushed around”. The third factor assesses the opposite and includes confidence in personal problems, hopefulness, determination, feeling as if “things are going your way”, feeling “on top of things”, future orientation,

expectation for good experiences, expectations for poor outcomes. The fourth factor addresses the component of motivation that describes drive to execute behavior (Wise 1987). The items include preference to let things happen than to understand why, perspective on conformity of life, and hesitancy toward decision making.

Analysis

Descriptive statistics were obtained for all items including: distributions, means, medians, variances, standard deviations, skewness, kurtosis, ranges, and quartiles. Tests of normality of continuous measures were made using the Shapiro-Wilk and the Kolomogorov D statistics in conjunction with plots of the distribution of data and descriptive measurements. Data were also examined for missing values and homogeneity of variance. Factor analysis was used to examine the multi-dimensionality of the scale using Varimax rotation. Cronbach's alpha was used to examine internal validity of items.

To answer the question if successful agers rate themselves significantly different on motivation than others, subjects were divided into two groups according to the self-reported successful aging scale. Previous publications determined successful aging as 7 or above containing 97% of the cohort (Montross 2006.) We chose low successful agers with scores 1-8 making up 53.1% and high scores 9-10 making up 46.9% of the sample population due to distribution of our data. Chi-square, one way analysis of variance, and covariance were used to test group differences. Pearson correlation and regression analysis was also used. SPSS version 17 was used and all analyses were two-tailed, where applicable, with $\alpha = .05$.

Results

From the initial 1500 participants, 523 subjects had valid data for all items and were selected for the study. The cohort is 52.8% male and 46.5% female. Education ranged from grade school to professional degrees with the most participants (46.5%) completing an associates degree or bachelor's degree. The average age is 83 years old and income levels highly representative in the \$20-50,000 range. The cohort was predominantly Caucasian (90%) with 7% Hispanic population and 3% Asian American.

The 23-item motivation score was chosen based on above criteria (see *motivation* above) and selected for factor analysis to create the motivation scale (Table 1). Factor analysis initially produced five factors explaining 48.79% of the variance. Factor 1, Freedom of negative affect, included 7 items and explained 26.02% of the variance, disempowerment included 5 items and explained 7.07%, empowerment explained 5.48%, drive explained 4.39% while the 5th factor explained 3.98%. The number of factors was optimized to increase the significant percentage of explained variance and align with the theoretical model for motivation. As a result the model was reduced into only four factors which explaining 43.51% of the variance. Internal reliability (Cronbach's alpha) for the whole scale and each factors were calculated and effect of each item deletion on the each scale internal reliability was examined. Cronbach's alpha for the whole scale and these factors are .848, .735, .787, .711, .374 respectively. The fourth factor has

lowest internal reliability partially due to the small number of items (3 items) in the factor. The total motivation scale score was calculated for the cohort and descriptive information were examined.

Table 1: Internal Reliability for each factor and if item is deleted:

	<i>Motivation Scale Total</i>	Cronbach's alpha	Original Scale
Factor 1: Freedom from negative affect		.735	
1	<i>Little interest or pleasure in doing things</i>	.669	<i>PHQ-9</i>
2	<i>Feeling bad about yourself, feeling that you are a failure</i>	.638	<i>PHQ-9</i>
3	<i>How often do you feel fearful</i>	.576	<i>BSI Anxiety</i>
4	<i>Angered because of things that were outside of your control</i>	.575	<i>PSS</i>
5	<i>Extent social activity is limited from your physical or emotional problems</i>	.556	<i>SF-36</i>
6	<i>How often have you felt that you could not cope with the things that you do</i>	.554	<i>PSS</i>
7	<i>How often do you feel nervous</i>	.512	<i>SF-36</i>
Factor 2 - Disempowerment		.787	
1	<i>I have little control over the things that happen to me</i>	.748	<i>PMS</i>
2	<i>There is really no way I can solve some of the problems I have</i>	.740	<i>PMS</i>
3	<i>There is little I can do to change many of the important things in my life</i>	.656	<i>PMS</i>
4	<i>I often feel helpless in dealing with the problems of life</i>	.610	<i>PMS</i>
5	<i>Sometimes I feel that I'm being pushed around in life</i>	.583	<i>PMS</i>
Factor 3 - Empowerment		.711	
1	<i>I am confident in my ability to handle personal problems</i>	.634	<i>PSS</i>
2	<i>I am always hopeful about my future</i>	.603	<i>OPT</i>
3	<i>I can do just about anything I really set my mind to do</i>	.598	<i>PMS</i>
4	<i>Things are going my way</i>	.597	<i>PSS</i>
5	<i>I am on top of things</i>	.527	<i>PSS</i>
6	<i>What happens to me in the future mostly depends on me</i>	.441	<i>PMS</i>
7	<i>Overall, I expect more good things to happen to me than bad</i>	.399	<i>OPT</i>
8	<i>I hardly ever expect things to go my way</i>	.346	<i>OPT</i>
Factor 4 - Drive		.374	
1	<i>I prefer to just let things happen than to understand why</i>	.643	<i>3D-Wisdom</i>
2	<i>Life is basically the same most of the time</i>	.569	<i>3D-Wisdom</i>
3	<i>I am hesitant about making important decisions</i>	.551	<i>3D-Wisdom</i>
Motivation Scale Total		.848	

PHQ-9: Patient Health Questionnaire depression scale
 BSI Anxiety: Brief Symptom Inventory Anxiety Scale
 PSS: Perceived Stress Scale
 SF-36: patient health
 PMS: personal mastery scale
 OPT: optimism scale
 3-D Wisdom: 3 dimensional wisdom scale

There is a significant correlation between motivation total score and its four factors and successful aging score ($r=.327$) (Table 2). Higher successful aging scores are associated with higher motivation scores.

Table 2 Correlation of Motivation and Successful Aging

	Freedom from Negative Affect	Hopefulness	Self-Worth	Drive	Motivation Total
Successful Aging	.275**	.339**	.297**	.113 *	.327**

** Correlation is significant at the 0.01 level (2-tailed).

*Correlation is significant at the 0.05 level (2-tailed).

There is no significant difference between high and low successful aging groups in gender, age, independent of longevity, ethnicity, education level, and personal income between the groups.

High successful aging groups have significantly higher motivation total scores than low successful aging group ($f=34.38$; $df=1,505$; $p = .000$), even after correcting for physical function ($f=22.69$; $df=1, 491$; $p = .000$) or social functioning ($f=23.82$; $df=1,503$; $p = .000$). There were significant differences between these groups on all motivation factors (Table 3).

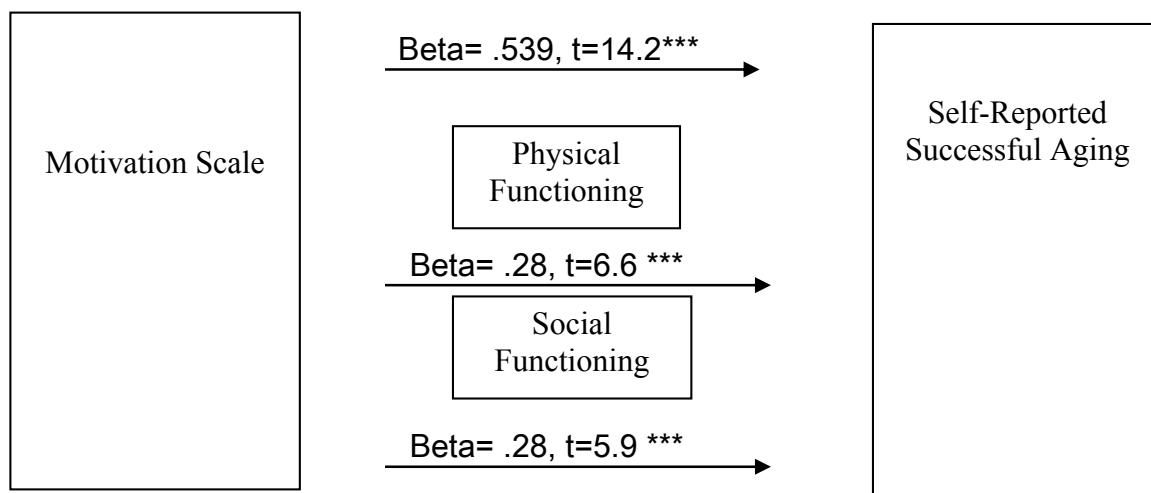
Motivation is a significant predictor of successful aging ($Beta= .54$ $t=14.2$, $p < .001$, Figure a). Motivation is also a predictor of successful aging when controlling for physical ($Beta=.28$, $t=6.6$, $p < .001$) and social functioning ($Beta=.28$, $t=5.9$, $p < .001$).

Table 3: Comparison of two successful aging groups

	Successful Aging Group		X ² /f	dfs	P
	Low	High			
Gender Female	48.7%	44.7%	.799	1	NS
Race (Caucasian)	81.0%	79.7%	.119	1	NS
Education 1: Up to vocational school	40.2%	34.7%	1.16	2	NS

Income % LE 50K	56%	60.5%	1.06	1	NS
Age	83.03(7)	83.66(8)	.932	1,505	NS
Independent of Longevity	83.03+7.11	83.66+7.51	.932	1,505	.335
Motivation Total	78.89	73.64	2.123	1,505	.000
Factor 1 Freedom from negative affect	25.2	23.8	20.74		
Factor 2 Hopefulness	15.40	24.12	29.97		
Factor 3 Self-worth	27.72	25.82	29.73		
Factor 4 Drive	10.79	10.47	2.193		

Figure a.



Linear Regression Analysis *** $p < 0.001$

Discussion

The UCSD Motivation Scale (UMS) can be defined by four components; freedom from negative affect, disempowerment, empowerment, and drive. The four factors demonstrate internal reliability. The four factors prove useful in determining not only the components of motivation that the scale measures, but which part of the scale has higher validity and predictability for successful aging. There is internal consistency of three of

the four factors. The fourth factor is composed of three items which contribute to its low internal consistency. The total motivation score also correlates with other measures in the SAGE study. There is a significant relationship between motivation and successful aging.

Motivation was predictive of successful aging. Linear regression analysis of motivation scores and successful aging scores even while controlling for physical and social functioning demonstrate a predictive model. This proves useful in determining the ability of the motivational scale to predict the successful aging of a participant. Low motivation scores can provide necessary evidence for future low successful aging scores and provide insight into offsetting poor successful aging.

Assessing successful aging and its component scales in the SAGE Questionnaire has several limitations. First, the data collected in the SAGE study is only cross sectional and does not have any longitudinal data at this point. It is a goal for the SAGE study to follow selected participants and collect data on their aging over time. It would also be useful to do a test re-test reliability analysis to ensure similar scores in the same population and also test the scale in different populations. Representation of sub-domains of motivation was limited by the available items, and some domains may not have been as well represented by virtue of the initial item set. All items were self-reported and so behavioral or observational measures of motivation would be useful as well.

Conclusion

The SAGE motivation Scale (SMS) is an internally reliable four-component scale that serves as a potentially useful tool for the study of motivation in aging research. There is a significant association between total motivation score and successful aging. When successful aging scores are categorized into high and low successful aging, higher successful aging scores significantly predict high total motivation scores and similarly, lower successful aging scores predict lower total motivation scores. A higher successful aging score is associated with higher total motivation score even when correcting for physical and social functioning. There are no significant gender differences between high and low successful agers and no differences in age indicating that self-reported successful aging depends on factors outside lifespan. Similarly, no significant differences in ethnicity, education, and income exist between high and low successful agers. This further supports the motivation score differences between high and low successful agers is a function of motivation and not confounding factors in demographics. The impact of motivation in how patients age is clear. This can lead the way for behavioral based treatment plans to help patients in the process of ageing successfully.

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