A peer-reviewed version of this preprint was published in PeerJ on 28 January 2016.

View the peer-reviewed version (peerj.com/articles/1655), which is the preferred citable publication unless you specifically need to cite this preprint.

Sano N, Kyougoku M. 2016. An analysis of structural relationship among achievement motive on social participation, purpose in life, and role expectations among community dwelling elderly attending day services. PeerJ 4:e1655 https://doi.org/10.7717/peerj.1655

The effect of achievement motive on social participation, ikigai, and role expectations in community-dwelling elderly people by using cross-sectional research

Abstract

Background: Achievement motive is defined as the intention to achieve one's goals. It is an important consideration in rehabilitation. However, previous studies have not demonstrated the causal relationship between achievement motive and a more enhanced quality of life such as the concept of ikigai and role expectation.

Purpose: The purpose of this study is to identify the effect of achievement motive on ikigai, social participation, and role expectations of community-dwelling elderly people.

Methods: Participants were community-dwelling elderly people in day-service centers. A total of 281 participants (male: 127, female: 154)

answered the self-administered questionnaire in cross-sectional research. The questionnaire comprised demographic data and scales that evaluated achievement motive, social participation, ikigai, and role expectation. We studied the causal relationship established on our hypothesized model by a structural equation modeling approach.

Results: We checked the standardized path coefficients and the modification indices, and the modified model were good fit statistics: CFI = .984, TLI = .983, RMSEA = .050, 90% CI [.044, .055]. Achievement motive had a significant direct effect on ikigai (direct effect = .445, p value = .000), a significant indirect effect on ikigai via social participation or role expectation (indirect effect = .170, p value = .000) and a total effect on ikigai (total effect = .615).

Discussion: This result suggested that enhancing the intention to achieve one's goals enables participants to feel a spirit of challenge with a purpose and a sense of fulfillment in daily living. At the same time, engaging in important activities for oneself as well as recognizing one's role in society enables participants to experience a willingness to help others. We recommend that

rehabilitation therapists collaborate with their clients to form new goals based on the clients' achievement motive.

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Introduction

Achievement motive is a significant concept for the assessment and intervention of clients in rehabilitation (Lampton, Lambert & Yost 1993; Resnick et al. 2002; Spivack et al. 1982; Vanetzian 1997). It is hoped that strong achievement motive will improve the outcome and quality of rehabilitation (Sano, Nakashima & Sano 2015). Achievement motive is defined as "the intention to achieve one's goals while maintaining a standard of excellence" (Sano, Kyougoku & Yabuwaki 2014). We can perceive achievement motive in rehabilitation from two points of view: Self-mastery–derived and Means/process-oriented–derived (Sano, Kyougoku & Yabuwaki 2014). Self-mastery–derived achievement motive is defined as attempting to achieve one's goals through individual effort in order to be accepted by oneself and others through enhancement of one's own abilities and intelligence (Sano, Kyougoku & Yabuwaki 2014). Means/process-oriented–derived achievement motive is defined as striving to achieve one's goals by following a rehabilitation method approved by oneself and others (Sano, Kyougoku &

66 Yabuwaki 2014).

67 Based on the two viewpoints of achievement-motive–related
68 rehabilitation, we developed a scale for patients with orthopedic diseases and
69 for elderly people, called a Scale for Achievement Motive in Rehabilitation
70 (SAMR) (Sano & Kyougoku 2015; Sano, Kyougoku & Yabuwaki 2014).
71 Analysis of SAMR using confirmatory factor analysis (CFA) found that two
72 factors showed a good model fit [goodness-of-Fit Index (GFI) = .930, adjusted
73 GFI = .887, comparative fit index (CFI) = .933, and root mean square error of
74 approximation (RMSEA) = .098]. The structural validity of SAMR for elderly
75 people was GFI = .901, Adjusted GFI = .840, and RMSEA = .098. Therefore,
76 the structural model of SAMR has verified the correctness. In addition, SAMR
77 was examined in validity and reliability. The content and the face validity
78 showed a ratio of consensus >70% and the concurrent validity showed a
79 moderate or weak correlation (.224–.649) with a scale for measuring the
80 achievement motive; in addition, the test–retest reliability was >.400 and
81 internal consistency was .688–.833 (Sano 2012; Sano & Kyougoku 2015; Sano,

82 Kyougoku & Yabuwaki 2014).

83 In our survey, achievement motive was related to social participation
84 and health-related quality of life (HRQOL) (Sano 2014). Social participation is
85 defined in terms of the consequences of activities in the social environment
86 (Bukov, Maas & Lampert 2002). HRQOL is defined as a comprehensive
87 concept of one's health condition (Ikegami et al. 2001). Moreover, it was found
88 that the indirect effect of achievement motive on HRQOL via social
89 participation was higher than the direct effect of achievement motive on
90 HRQOL (Sano 2014). It is necessary to examine the detailed causal
91 relationship of the factors of HRQOL that achievement motive contributes to
92 and how achievement motive affects HRQOL.

93 We predict that achievement motive has a positive relationship with
94 the concept of ikigai that is used as outcome indices to assess the subjective
95 QOL of elderly persons (Demura, Kobayashi & Kitabayashi 2005; Ishida 2012;
96 Kumano 2006; Shirai et al. 2006). Ikigai is defined as a spirit of challenge with
97 purpose and motivation toward everyday life, along with a sense of

responsibility for helping others (Kondo 2007). Ikigai involves role expectation (Demura 2006). Role expectation is defined as an understanding of one's contribution to society and others (Demura 2006). Social participation related to achievement motive had a positive influence on ikigai in the longitudinal study during a 6-month period (Imai 2013).

However, the influence of achievement motive on ikigai, role expectation, and social participation remains unclear. Thus, we hypothesized that a high state of achievement motive leads to satisfaction in social participation, ikigai, and role expectation for elderly persons. In addition, we hypothesized that social participation and role expectation promoted by achievement motive have an enhancing effect on ikigai. For this reason, we created a hypothesized model demonstrating that the achievement motive has a positive effect on ikigai, role expectation, and social participation and that social participation and role expectation have a positive effect on ikigai (Fig. 1). The purpose of this study was to identify the effect of achievement motive on ikigai, social participation, and role expectation of community-dwelling

elderly people.

Methods

Ethics Statement

This study was conducted in accordance with the Declaration of Helsinki and was approved by the Ethics Committee of the Kibi International University (No. 13-34). In addition, we were approval by the facility directors of the institutions that cooperated in this study. We explained to participants that they could freely decide whether to participate in the study and could refuse to answer the questionnaire during this study. We completely protected the privacy of personal information. Furthermore, we obtained written informed consent from all participants. Participants would put the questionnaire in the box or hand the staff it.

Participants

Participants were community-dwelling elderly people in day-service centers.

We recruited a total of 304 participants from 11 day-service centers that participated in this study. As the exclusion criteria, we excluded people who had been diagnosed with mental disorders such as schizophrenia and dementia, those who demonstrated clinical decline of cognitive function, and those who could not read or write the questionnaire forms.

Procedures

This study used cross-sectional research. We used our self-administered questionnaire comprising demographic information, SAMR, Self-Completed Occupational Index (SOPI), and K-1 Scale for the Feeling that Life Is Worth Living among the Aged (K-1 Scale).

Measures

1) Demographic information

Demographic data such as gender, age, the name of the primary illness or disease, nursing care level (needing care: 1–5, needing support: 1–2 or

146 nothing), the number of housemates, activities outside the home and hobbies,
147 family structure, and subjective economic condition were obtained. The
148 respective number of outside-the-home activities and hobbies were
149 determined as follows: “How many times a week do you usually go outside
150 your home?” and “How many hobbies do you have that continue to give you
151 pleasure?” The subjective economic condition ranged from 1 to 4 (1 = I am
152 economically stable and I don’t have to worry and 4 = I am poor and very
153 nervous about my financial future (Mizota 2009).
154 2) SAMR (Sano & Kyougoku 2015; Sano, Kyougoku & Yabuwaki 2014)
155 We selected SAMR comprising 10 items to evaluate the state of achievement
156 motive of clients and assumed in oblique 2-factor models: a) Self-mastery–
157 derived (six items), b) Means/process-oriented–derived (four items). Each item
158 in SAMR had a 7-point Likert scale ranging from 1 (strongly disagree) to 7
159 (strongly agree). The following is an example of an item: “I think that I can
160 overcome any difficulty to achieve my goal.” The standardization score
161 calculated depending on a total score, and if the achievement motive is strong

then the standardization score will be high.

3) SOPI (Imai & Saito 2010; Imai & Saito 2011)

We selected SOPI comprising 9 items to evaluate the state of social participation of clients and assumed in oblique 3-factor models: a) Leisure, b) Productivity, c) Self-care (each with three items). Each item in SOPI had a 5-point Likert scale ranging from 1 (I hardly have been satisfied) to 5 (I have been very satisfied). Summary score was calculated the following equation; (total score of 9 items - 9) / 36 * 100. The following in an example of an item: "Have you been able to perform important leisure activities in the past month?" SOPI was accepted for validity (concurrent) and reliability (internal consistency). If the quality of social participation is high then the total score of SOPI will also be high.

4) K-1 Scale (Kondo 2007)

We selected K-1 Scale comprising 16 items to evaluate the state of ikigai and assumed in oblique 4-factor models: a) Self-realization and will (six items), b) Sense of life fulfillment (five items), c) Will to live (two items), d) Sense of

existence (three items). Each item in K-1 Scale had a 3-point Likert scale ranging from 2 (yes) to 0 (no). The following is an example of an item: "I feel something to realize my accomplishment." We reverse-scored the item 2, 4, 9, and 12 that were phrased so that an agreement with the item represents a low level of ikigai. K-1 Scale was accepted for validity (concurrent, factorial) and reliability (test–retest, internal consistency). If the quality of ikigai is high, the total score of K-1 Scale will also be high.

5) Role expectation

We evaluated role expectation in a multiple-choice form. We provided 11 items for reference to a role checklist: volunteer, caregiver, housework, friend, family member, religionist, hobbyist or amateur, participant in an organization, student, worker, and other (Kielhofner 2007). Participants selected the roles that were applicable to them. In the analysis, we counted the total number of chosen roles, and aggregated choices of each role.

Statistical methods

194 Descriptive statistics and test of normality were conducted using SPSS
195 Statistics 22
196 (http://www-01.ibm.com/software/jp/analytics/spss/products/statistics/). Item
197 validity was conducted using Exametrika Version5.3
198 (http://antlers.rd.dnc.ac.jp/~shojima/exmk/index.htm). Correlation between
199 SAMR, SOPI, K-1 Scale and role expectation were conducted using HAD12
200 (http://norimune.net/had). Tests of structural validity and causal relationship
201 were conducted using Mplus v7. 2 (http://www.statmodel.com).

202 **1) Descriptive statistics and test of normality**

203 We performed simple descriptive statistics including means and standard
204 deviation (SD) for this study variable to summarize the characteristics of the
205 participants. We also calculated Kolmogorov–Smirnov test, skewness and
206 kurtosis to test normality of each variable.

207 **2) Items validity**

208 We calculated the mean information content (entropy) and the total polyserial
209 correlation coefficient (PCC) for all items of SAMR, SOPI, and K-1 Scale to

examine the item validity of its three scales using this study. A PCC value of >0.2 was the standard item validity (Toyoda 2002).

3) Structural validity

We examined the structural validity for SAMR, SOPI, and K-1 Scale using CFA by a structural equation modeling (SEM) approach (Muthén 1983). Factor structure of each scale was examined in the same factor structure with previous studies. We used the Maximum Likelihood with Robust standard error (MLR) with missing data for SAMR and SOPI and the modified weighted least squares method (WLSMV) with missing data for K-1 Scale. We referred to several fit indices: CFI, Tucker Lewis Index (TLI), and RMSEA with 90% confidence interval (CI). A CFI and TLI value of >0.9 was the best model fit. For RMSEA, values ≤0.05 indicate a close fit, those of ≤0.08 indicate a reasonable fit, and those of ≥0.1 indicate a poor fit (MacCallum, Browne & Sugawara 1996).

4) Correlation between SAMR, SOPI, K-1 Scale, and role expectation

226 We calculated polychoric correlation, polyserial correlation or spearman
227 correlation for subscale score, total scale score, and summary score of SAMR,
228 SOPI, K-1 scale, and role expectation (total number of role item, each role
229 item) to examine the correlation between this study variable. Values of >0.2
230 and <0.4 indicate weak correlation, those of >0.4 and <0.7 indicate moderate
231 correlation, and those of >0.7 and <0.9 indicate a strong correlation.

232 **5) Causal relationship**

233 We tested our hypothesized model (Fig. 1) using Multiple Indicator MultIple
234 Cause (MIMIC) by a SEM approach. MIMIC is the model to verify a
235 hypothesis that some observation variables affect several latent variables and
236 the latent variables affect some different observation variables (Kosugi &
237 Shimizu 2014). This approach allowed us to evaluate how well our
238 hypothesized relationships between a latent exogenous variable (achievement
239 motive), latent mediators (social participation, role expectation), and a
240 manifest endogenous variable (ikigai) fit our data. In our study, we used the
241 WLSMV with missing data for our analysis. We referred to several fit indices:

242 CFI, TLI, RMSEA, 90% CI. The standard of the best model fit was the same as
243 that of structural validity. We also estimated the values of direct effect and
244 indirect effect each with 90% IC.
245
246 **Results**
247 **Participant characteristics**
248 A total number of 281 participants answered the questionnaire (valid
249 response rate: 92.4%); 127 (45.2%) were men and 154 (54.8%) were women,
250 and mean age was 77.1 ± 8.7 years. Details of the sample characteristics are
251 described in Table 1.
252 **1) Descriptive statistics and test of normality**
253 Table 2 indicates descriptive statistics and normality tests of the three scales
254 (SAMR, SOPI, and K-1). In a test of normality, only summary score of SOPI
255 had normality (0.069) (Table 2). Although the other variables had not an
256 extreme deviation from the mean and SD, the items of SAMR and K-1 were
257 needed attention in skewness and kurtosis.

258 **2) Items validity**

259 All items for SAMR, SOPI, and K-1 Scale were accepted and the value

260 satisfied the standard of PCC (Table 2).

261 **3) Structural validity**

262 CFA of SAMR, SOPI, and K-1 Scale demonstrated good fit statistics of the

263 same structure with previous studies. Fit indices of SAMR were CFI = .955,

264 TLI = .941, RMSEA = .061, 90% CI [.040, .081] and factorial correlation

265 between Self-mastery–derived and Means/process-oriented–derived was .768

266 (Fig. 2). Fit indices of SOPI were CFI = .982, TLI = .976, RMSEA = .058, 90%

267 CI [.034, .082] and factorial correlation between three factors was .731

268 (Leisure and Productivity), .598 (Leisure and Self-care) and .625 (Productivity

269 and Self-care) (Fig. 3). Fit indices of K-1 Scale were CFI = .944, TLI = .932,

270 RMSEA = .078, 90% CI [.066, .089] and factorial correlation between four

271 factors was .670 (Self-realization and will and Sense of life fulfillment), .822

272 (Self-realization and will and Will to live), .813 (Self-realization and will and

273 Sense of existence), .583 (Sense of life fulfillment and Will to live), .558 (Sense

of life fulfillment and Sense of existence), and .804 (Will to live and Sense of existence) (Fig. 4). Although SAMR and K-1 Scale were not sufficient to test for normality, we comprehensively decided that all scales were available for examination of correlation between this study variable and causal relationship.

4) Correlation between SAMR, SOPI, K-1 Scale, and role expectation

We excluded the role of student and other because the number of students was 0 and descriptive contents of other were unspecified. Positive correlation was accepted between most of the subscale score, summary score, and total scale score of SAMR, SOPI, and K-1 scale (Table 3). Of the total number of role items, the roles of Friend, Hobbyist or Amateur, and Participant in an Organization were a positive correlation with SAMR, SOPI, and K-1 scale (Table 4).

In particular, the subscale of Self-mastery–derived and total scale scores of SAMR was moderately correlated with the subscale score of

290 Self-realization and will, Sense of existence, and total scale scores of K-1 Scale
291 (.404–.542). The roles of volunteer, friend, hobbyist or amateur, participant in
292 an organization, and worker were moderately correlated with the subscale
293 score of K-1 Scale or a total scale score of K-1 Scale (.403–.528).

294 **5) Causal relationship**

295 The hypothesized model using SEM was good fit statistics: CFI = .986, TLI
296 = .985, RMSEA = .047, 90% CI [.042, .053] (Fig. 5). However, the standardized
297 path coefficient that achievement motive configured as the dominant
298 conception of two factors of SAMR affects Self-mastery–derived was beyond
299 1.0 (1.099). The correlation of two factors of SAMR was very strong; therefore,
300 a problem of linear dependence between these two factors or these items may
301 occur, similar to that in previous studies (Sano 2014). So, we restricted the
302 standardized path coefficients of Self-mastery–derived on the factor's items
303 and achievement motive on two factors of SAMR were to 1. As a result, the
304 modified model was good fit statistics: CFI = .984, TLI = .983, RMSEA = .050,
305 90% CI [.044, .055] (Fig. 6). With respect to the standardized path coefficients

306 in the modified model, achievement motive (direct effect = .445, p value
307 = .000), social participation (direct effect = .161, p value = .015), and role
308 expectation (direct effect = .224, p value = .000) had a significant positive
309 impact on ikigai; achievement motive (direct effect = .499, p value = .000) had
310 a significant positive impact on social participation; and achievement motive
311 (direct effect = .400, p value = .000) had a significant positive impact on role
312 expectation. Achievement motive [indirect effect = .080, p value = .018, 95% CI
313 (.014, .147)] had a significant positive effect on ikigai via social participation,
314 and achievement motive [indirect effect = .089, p value = .000, 95% CI
315 (.043, .136)] had a significant positive effect on ikigai via role expectation. The
316 sum of indirect effect was standardized path coefficients = .170, p value = .000,
317 95% CI [.079, .260]. The total effect of the achievement motive on ikigai was
318 standardized path coefficients = .615 (direct effect = .445 + indirect effect
319 = .170).
320

321 **Discussion**

322 The purpose of this study was to identify the influence of achievement motive
323 on ikigai, social participation, and role expectation of community-dwelling
324 elderly people. We were able to show statistical evidence according to our
325 hypothesis. Moreover, the results of item validity, structural validity of SAMR,
326 SOPI, and K-1 Scale have proved the validity of this study.

327 In the test of a causal relationship based on our hypotheses, it was
328 demonstrated that achievement motive had a positive impact on ikigai, social
329 participation, and role expectation. In addition, social participation and role
330 expectation had a positive impact on ikigai. We proved the strong effect of
331 achievement motive on outcome indices of elderly persons. In addition, we
332 confirmed the significant indirect effects of achievement motive on ikigai via
333 social participation or role expectation, though these indirect effects were not
334 strong. We expect that ikigai is enhanced through improvement of social
335 participation or role expectation by achievement motive. These results
336 suggest that enhancing the intention to achieve one's goals allows
337 participants to feel a spirit of challenge with a purpose and a sense of

fulfillment in daily living. At the same time, recognizing engagement in important activities for oneself and the role of oneself in society also helps participants feel capable of being helpful to others.

The direct effect of social participation and role expectation on ikigai was not so high. The result indicated that achievement motive has greater influence on the support-related ikigai for elderly persons than on social participation and role expectation. Ikigai contains the individual intention to achieve something (Demura 2006; Nomura 2005); therefore, enhancing ikigai may be the goal for elderly persons. For this reason, this study could elucidate the causal relationship that achievement motive has effect on ikigai in rehabilitation.

Moreover, achievement motive has a positive correlation with ikigai, social participation, and role expectation because the significant correlation was accepted among SAMR, SOPI, K-1 Scale, and the total number of role items. In particular, Self-mastery–derived was closely related to ikigai due to moderate correlation with the subscale score and total scale score of K-1 Scale.

354 Accordingly, we suggest that it is important to support clients in
355 rehabilitation by enhancing their own abilities and intelligence through
356 training, feedback, etc.

357 Regarding the correlation between SAMR, SOPI, K-1 Scale, and each
358 of the roles, the significant correlations of achievement motive, social
359 participation, and ikigai were almost unrecognized with the role in the home
360 (Caregiver, Housework, and Family member). On the other hand, the
361 significant positive correlation of these concepts was recognized with roles
362 related to society (friend, hobbyist or amateur, participant in an organization,
363 and worker). Therefore, we suspect that roles within the home do not have
364 much of an effect on the health care of community-dwelling elderly people. In
365 contrast, we expect that it is more effective to support community-dwelling
366 elderly people in roles related to their relationship with society.

367

368 **Contribution and limitation**

369 This study proved the influence of achievement motive on ikigai, social

participation, and role expectation of community-dwelling elderly people. We believe that this study reveals the effects of achievement motive. Although achievement motive has not been sufficiently studied, it is considered an important element in rehabilitation. (Resnick 1996). Therapists who perform rehabilitation may be able to share and collaborate with others in attaining the goal of helping clients from the new standpoint of achievement motive.

This study has a few limitations on study design. First, this study utilized data sampling and research for the participants restricted to day-service centers in specified areas. Second, this study examined causal relationships by cross-sectional research; therefore, it was difficult to confirm causal relationships of longitudinal changes (Stone-Romero & Rosopa 2008). Third, this study used a self-reported questionnaire to collect data and could examine only the subjective effects, but could not examine the effects by objective data indices. We hope to continue this study while considering these limitations.

386 **Acknowledgments**

387 We wish to thank the elderly people and the staff in day-service centers who

388 participated in this study, colleagues of the lab advice for us and the families

389 supported us.

390

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482

483 **Table 1. Participant characteristics**

	Class	n=281	%
gender	male	127	45.2%
	female	154	54.8%
age (mean±SD)	77.1±8.7		
disease	orthopedic	111	39.5%
	neurological	108	38.4%
	heart	5	1.8%
	others	29	10.3%
	unknown	28	10.0%
care level	care5	0	0.0%
	care4	8	2.8%
	care3	23	8.2%
	care2	74	26.3%
	care1	65	23.1%
	support2	59	21.0%
	support1	48	17.1%
	nothing	0	0.0%
	unknown	4	1.4%
housemate (mean±SD)	1.6±1.4		
going out (mean±SD)	4.0±3.0		
hobby (mean±SD)	1.4±1.3		
spouse	with	160	56.9%
	without	121	43.1%
grandchildren	with	44	15.7%
	without	237	84.3%
economic condition	1	68	24.2%
	2	172	61.2%
	3	38	13.5%
	4	2	0.7%
	unknown	1	0.4%
roles (mean±SD)	1.5±1.0		
	Volunteer	9	3.2%
	Care giver	3	1.1%
	House work	73	26.0%
	Friend	46	16.4%
	Family member	207	73.7%
	Religionist	9	3.2%
	Hobbyist	42	14.9%
	Organization	15	5.3%
	Student	0	0.0%
	Worker	5	1.8%
	Other	17	6.0%

484

485 Note.

486 Hobbyist = Hobbyist or Amateur, Organization = Participant in organization.

487 **Table 2. Descriptive statistics, test of normality and Items validity**

Item	Mean	SD	Skewness	Kurtosis	Normality	Entropy	PCC
K-1 Scale							
Item1	1.354	.821	-.736	-1.120	.000	1.408	.587
Item2	1.173	.833	-.335	-1.482	.000	1.377	.738
Item3	1.421	.764	-.880	-.738	.000	1.275	.689
Item4	1.365	.808	-.758	-1.051	.000	1.524	.666
Item5	1.482	.773	-1.074	-.475	.000	1.556	.683
Item6	1.231	.810	-.446	-1.338	.000	1.420	.656
Item7	1.159	.819	-.301	-1.446	.000	1.542	.713
Item8	1.329	.689	-.535	-.801	.000	1.362	.611
Item9	1.397	.786	-.830	-.883	.000	1.281	.707
Item10	1.195	.788	-.360	-1.304	.000	1.577	.734
Item11	1.441	.701	-.859	-.524	.000	1.542	.744
Item12	1.516	.753	-1.175	-.220	.000	1.554	.702
Item13	1.504	.733	-1.111	-.255	.000	1.544	.588
Item14	1.068	.798	-.123	-1.419	.000	1.410	.566
Item15	1.187	.824	-.360	-1.439	.000	1.392	.607
Item16	1.168	.798	-.312	-1.364	.000	1.237	.356
Realize	7.785	3.396	-.645	-.512	.000		
Fulfill	6.797	2.612	-.538	-.599	.000		
Will	2.950	1.237	-.938	-.229	.000		
Exist	3.538	1.983	-.358	-1.054	.000		
Total Score	21.171	7.335	-.546	-.514	.000		
SAMR							
Item1	5.129	1.390	-.856	.875	.000	2.363	.744
Item2	5.089	1.332	-.761	1.010	.000	2.290	.697
Item3	5.139	1.419	-.658	.308	.000	2.406	.748
Item4	4.723	1.442	-.540	.231	.000	2.468	.825
Item5	5.299	1.370	-.704	.452	.000	2.324	.819
Item6	4.750	1.389	-.344	.118	.000	2.407	.748
Item7	5.786	1.277	-1.240	1.897	.000	2.109	.756
Item8	5.505	1.300	-.972	1.043	.000	2.248	.694
Item9	5.760	1.340	-1.163	1.222	.000	2.159	.733
Item10	4.707	1.637	-.488	-.305	.000	2.592	.571
Mastery	30.044	6.663	-.781	1.467	.000		
Means	21.754	4.323	-1.009	1.822	.000		
Total Score	51.798	9.985	-.821	1.560	.003		
SOPI							
Item1	2.950	1.183	.006	-.895	.000	2.220	.865
Item2	2.928	1.157	-.014	-.784	.000	2.196	.879
Item3	2.871	1.219	-.027	-1.001	.000	2.232	.883
Item4	2.712	1.265	.157	-1.065	.000	2.250	.894
Item5	2.688	1.238	.198	-.972	.000	2.237	.910
Item6	2.647	1.268	.238	-1.019	.000	2.245	.918
Item7	3.208	1.217	-.344	-.838	.000	2.210	.818
Item8	3.082	1.155	-.148	-.791	.000	2.192	.900
Item9	3.072	1.233	-.033	-.978	.000	2.257	.860
Leisure	8.763	3.360	-.020	-.849	.000		
Productivity	8.054	3.670	.188	-.978	.000		
Self-care	9.362	3.461	-.169	-.799	.000		
Summary score	47.782	25.666	.100	-.671	**.069**		

488

489 **Table 3. Correlation between SAMR, SOPI, and K-1 Scale**

	Mastery	Means	SA Total	Leisure	Product	Self-care	Summary
Leisure	.388 **	.192 **	.337 **				
Product	.420 **	.217 **	.368 **				
Self-care	.374 **	.252 **	.353 **				
Summary	.419 **	.237 **	.377 **				
Realize	.542 **	.302 **	.494 **	.326 **	.291 **	.279 **	.323 **
Fulfill	.347 **	.091	.271 **	.291 **	.253 **	.309 **	.308 **
Will	.401 **	.253 **	.379 **	.286 **	.223 **	.161 *	.246 **
Exist	.404 **	.288 **	.407 **	.281 **	.306 **	.310 **	.324 **
K-1 Total	.534 **	.290 **	.483 **	.348 **	.319 **	.323 **	.362 **

490

491 Note.

492 Mastery = Self-mastery–derived; Means = Means/process-oriented–derived;

493 SA Total = total scale score of SAMR; Product = Productivity; Summary =

494 summary score of SOPI; Realize = Self-realization and will; Fulfill = Sense of

495 life fulfillment; Will = Will to live; Exist = Sense of existence; K-1 Total = total

496 scale score of K-1 Scale.

497 The values calculated by spearman correlation are on double line, the values

498 calculated by polyserial correlation are on underline, and other values are

499 calculated by polychoric correlation.

500 *p < .05. **p < .01.

Table 4. Correlation between SAMR, SOPI, K-1 Scale, and role expectation

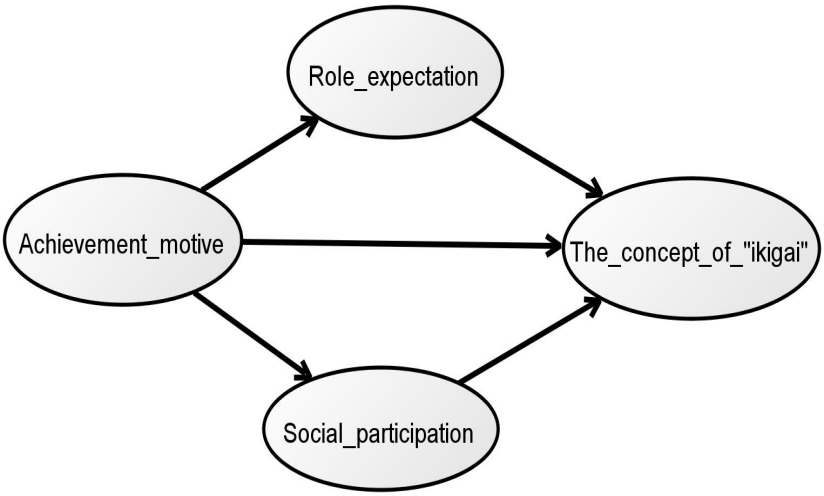
	Mastery	Means	SA Total	Leisure	Product	Self-care	Summary	Realize	Fulfill	Will	Exist	K-1 Total
Total roles	.314 **	.199 **	.298 **	.287 **	.272 **	.281 **	.305 **	.443 **	.284 **	.216 **	.364 **	.414 **
Volunteer	.217	.015	.150	.141	.064	.019	.090	.325 *	.371 *	-	.198	.463 +
Care giver	.178	.320	.256	.097	.050	-.156	-.008	.345 +	.362 +	.161	.226	.324 +
House work	.023	.048	.051	.037	.126	.079	.087	.073	.022	-.100	.179 *	.056
Friend	.313 **	.154	.274 **	.320 **	.308 **	.372 **	.372 **	.452 **	.231 *	.049	.257 **	.405 **
Family	.018	-.013	-.004	.050	.021	-.050	.007	.050	.101	.290 **	.080	.114
Religionist	.355 *	.342	.396 *	.186	.011	.193	.139	.251 +	.160	.186	.244	.271
Hobbyist	.390 **	.311 **	.399 **	.377 **	.295 **	.399 **	.387 **	.458 **	.303 **	.131	.257 **	.422 **
organization	.406 **	.075	.294 **	.275 *	.228 +	.220 +	.257 +	.470 **	.339 **	.313 *	.427 **	.522 **
Worker	.079	.291	.176	.033	.194	.089	.111	.446 *	.403 *	.353	.528 **	.534

Note.

Most of abbreviations are similar to Table 3. Total roles = total number of roles; Family = Family member; Hobbyist = Hobbyist or Amateur; Organization = Participant in organization.

The values calculated by polyserial correlation are on underline, and other values are calculated by polychoric correlation.

$^{+}p < .10$. $^{*}p < .05$. $^{**}p < .01$.



512

513 **Figure 1. Hypothesized model**

514

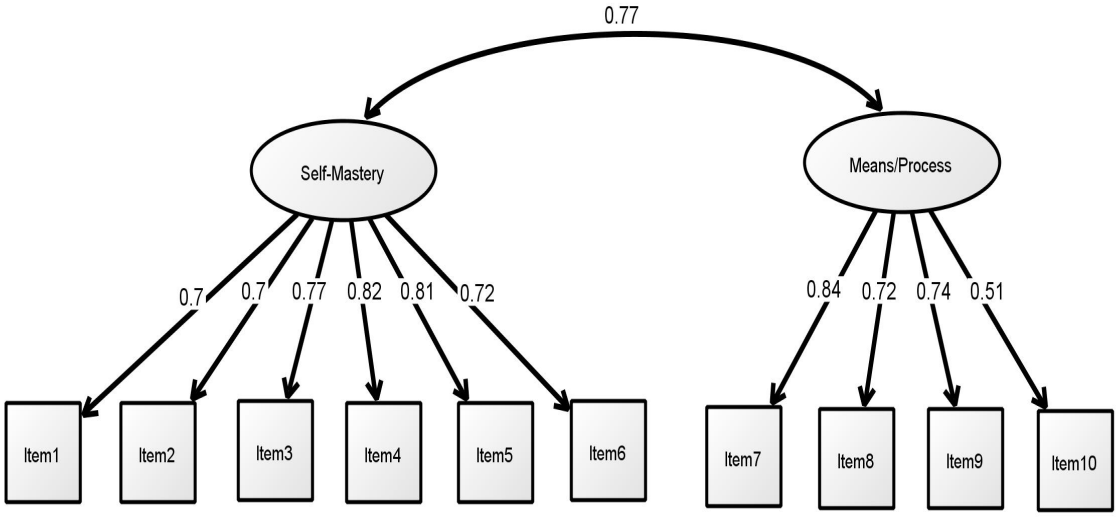


Figure 2. CFA of SAMR

Note.

CFI = .955, TLI = .941, RMSEA = .061, 90% CI [.040, .081].

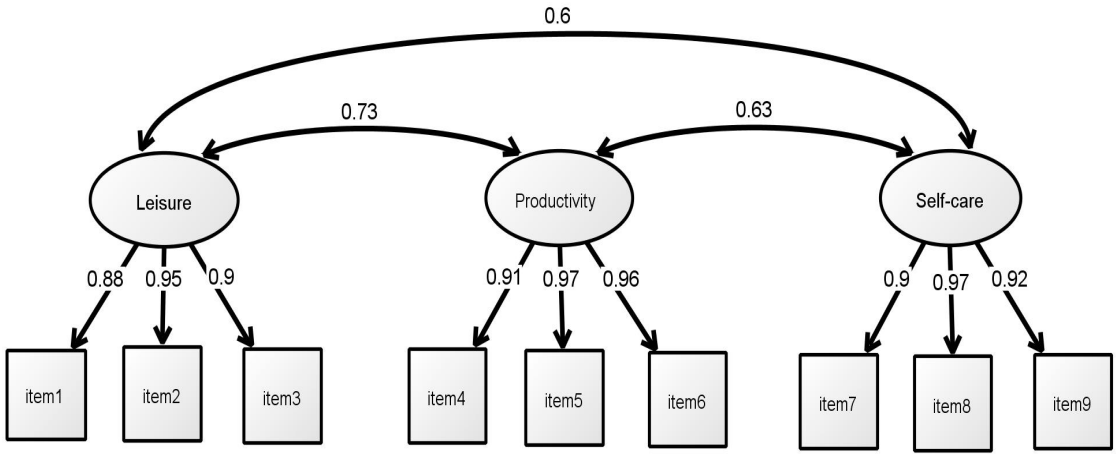


Figure 3. CFA of SOPI

Note.

CFI = .982, TLI = .976, RMSEA = .058, 90% CI [.034, .082].

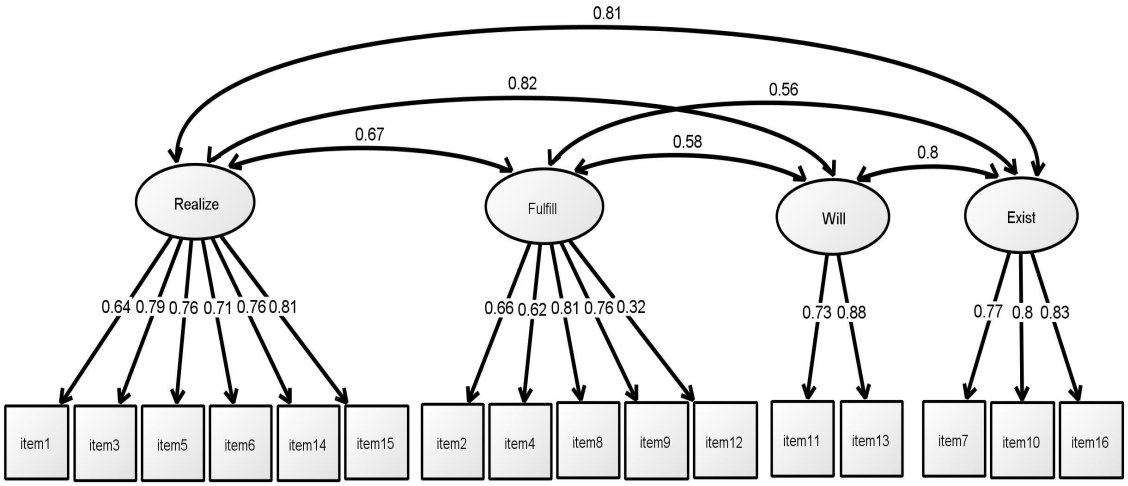
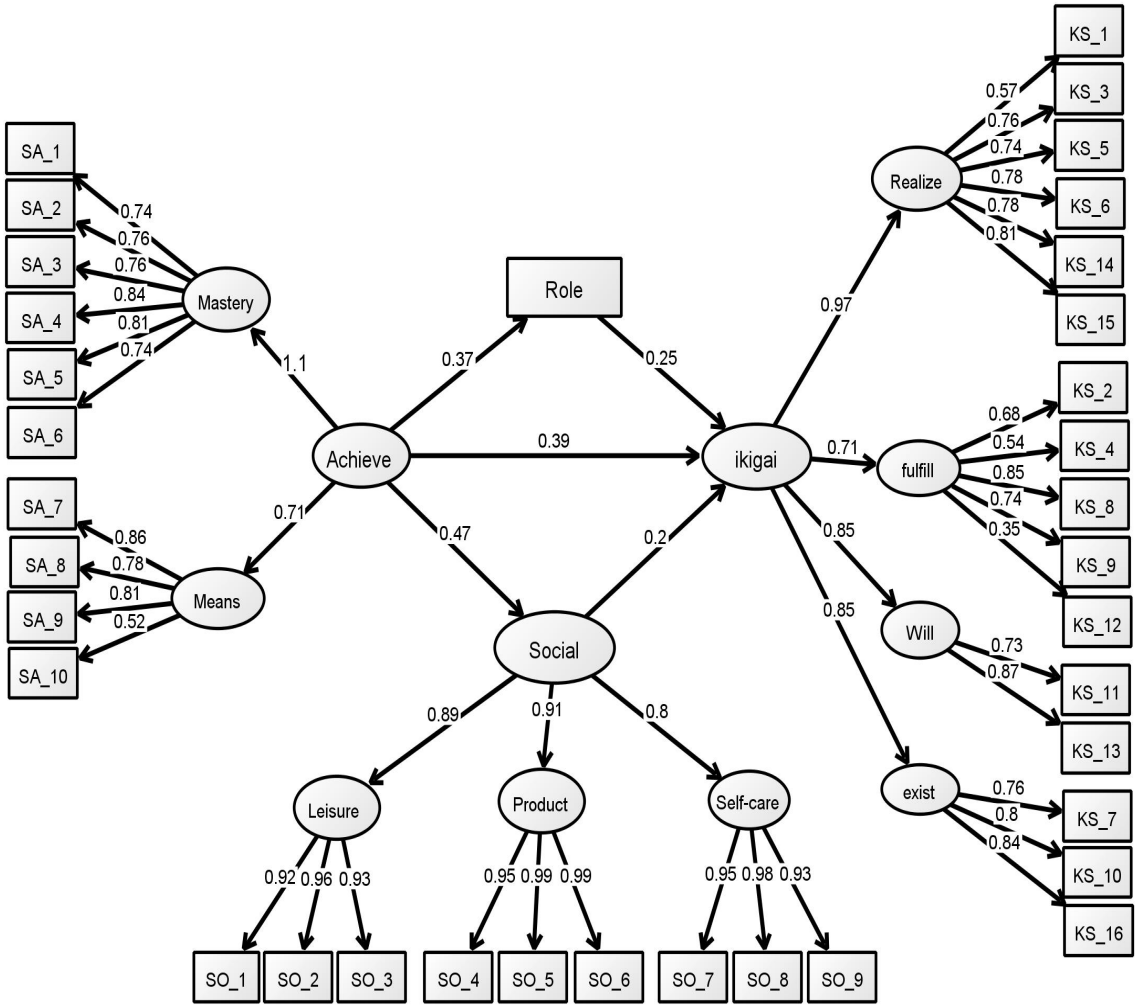


Figure 4. CFA of K-1 Scale

Note.

CFI = .944, TLI = .932, RMSEA = .078, 90% CI [.066, .089].

Abbreviations of the four factors are similar to Table 3.



531

532 **Figure 5. Hypothesized model using SEM**

533 Note.

534 CFI = .986, TLI = .985, RMSEA = .047, 90% CI [.042, .053].

535 Most of abbreviations are similar to Table 3. Achieve = achievement motive;

536 Role = total number of roles; Social = social participation; ikigai = the concept

537 of "ikigai,"; SA_ = items of SAMR; SO_ = items of SOPI; KS_ = items of K-1

538 Scale.

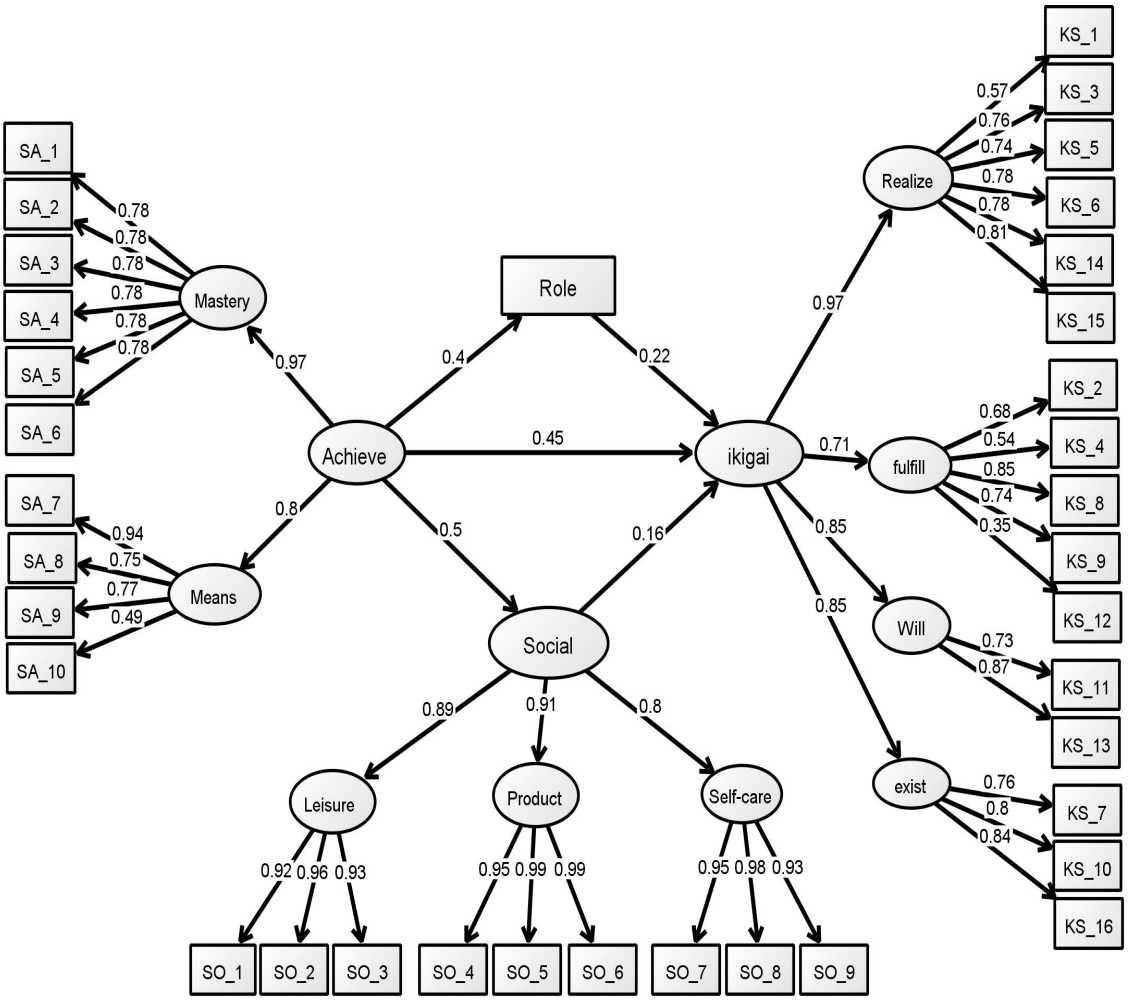


Figure 6. Modified model using SEM

Note.

CFI = .984, TLI = .983, RMSEA = .050, 90% CI [.044, .055].

Abbreviations are similar to Table 3 and Figure 5.

Standardized path coefficients of Self-mastery–derived on the factor's items and achievement motive on two factors of SAMR were restricted to 1.