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Psychometric Properties of Japanese Version of the Attitudes towards Fertility and Childbearing Scale (AFCS)

Mieko Miyata[1*], Takehisa Matsukawa[2], Yoshio Suzuki[3], Kazuhito Yokoyama[2] and Satoru Takeda[1]

[1]Department of Obstetrics and Gynecology, Faculty of Medicine, Juntendo University, Tokyo, Japan.
[2]Department of Epidemiology and Environmental Health, Faculty of Medicine, Juntendo University, Tokyo, Japan.
[3]Graduate School of Health and Sports Science, Juntendo University, Tokyo, Japan.

Authors' contributions

This work was carried out in collaboration between all authors. Authors MM, TM, KY and ST designed the study, performed statistical analyses and wrote the first draft. Author YS performed the questionnaire survey. Author ST revised the manuscript. All the authors read and approved the final manuscript.

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ABSTRACT

Aim: To verify the psychometric properties of the Japanese version of the Attitudes toward Fertility and Childbearing Scale (AFCS).
Study Design: A cross-sectional, descriptive study. The sample was examined again for the test-retest reliability.
Place and Duration of Study: The sample included 1149 participants. They were students of a university in the Kanto area, workers, couples under fertility treatment, parents with children attending a nursery, and couples attending an antenatal clinic in Japan. The study was conducted between April and June 2016.
Methodology: A set of questionnaires including the AFCS were distributed.

**Corresponding author: E-mail: mieya@juntendo.ac.jp;*

Results: A 5-factor structure was extracted by exploratory factor analysis, which we found to be robust in confirmatory factor analyses with comparison with other models. Subscales included Personal Development, Restrictedness, Avoidance of Responsibility, Social Identity, and Importance. Internal consistency and test-retest reliability were confirmed. The 5 subscales showed expected correlations with other variables and good construct validity.
Conclusion: The Japanese version of the AFCS may be a psychometrically sound measure of women's as well as men's attitudes towards childbearing.

Keywords: Attitudes towards childbearing; factor structure; Japan; reliability; construct validity.

1. INTRODUCTION

In high-income countries, married couples have the liberty to decide when to have offspring. This usually leads to a delayed age of first delivery and possibly linked to difficulties related to pregnancy and childbirth. This is also a social issue in Japan because the total fertility rate has been less than 2.0 for more than two decades with a constant decrease. There may be a variety of reasons that women postpone giving birth including higher education among women, wider labour markets for women [1], or psychological attitudes towards childbearing. Traditional emphasis on women's childbearing and household responsibilities has been drastically shifted towards more gender equality. Women may view other issues more important than childbearing. Despite its potential importance, such psychological traits have unduly received little study thus far.

As an instrument to measure such attitudes towards childbearing, Söderberg, Christensson, Lundgren, & Hildingsson [2] developed the Attitudes toward Fertility and Childbearing Scale (AFCS). This is a 25-item self-report with a 5-point scale. Other similar instruments or interviews developed thus far are applicable only for limited populations, such as adolescents [3,4], young adults [5], and patiets with anorexia nervosa [6] and cancer [7,8]. They also include ad hoc measures for specific reeserch purposes [9-11]. The AFCS is applicable for people with a wider background.

This scale was validated among Swedish women who were not yet mothers. Despite its strength because it focuses exclusively on attitudes towards childbearing, the scale still remains to be further studied. Firstly, its factor structure remains to be investigated. The original authors studied 138 Swedish women with a mean age of 24.6, and identified three components: "importance of fertility for the future", "childbearing as a hindrance at present", and "social identity". It may be that they used a principal component analysis (PCA). PCA is "a mathematical algorithm that reduces the dimensionality of the data while retaining most of the variation in the data set" [12]. Usually, it makes the first component represent as much variance as possible. Therefore, it does not necessarily represent the natural structure of factors behind the observed data. Hence, the number of components is often smaller than that identified by a factor analysis. Factor analysis, on the other hand, aims to identify latent variables that are expressed via observed variables. The number of factors can be set by a researcher, who in turn, compares the goodness-of-fit of the factor structure models. The 3-component structure of the AFCS should be reanalysed by factor analysis.

A second psychometrical question is related to the fact that the AFCS was only validated among women in the original study. However, it is of great importance to examine whether it can be applicable as a measure to men's attitudes towards childbearing. This is because a woman's decision to have a baby is tightly linked to, and may be strongly influenced by, their partner's attitude to childbearing.

Thirdly, if the AFCS is to be used as a generic tool to study attitudes towards childbearing, it should be used among unmarried people as well as couples who already have a child. We expect that men and women who are not yet married will have a weaker desire and expectation for having a baby than those who are married [13], and have more negative attitudes towards childbearing. Similarly, people undergoing fertility treatment as well as men and women expecting a baby may have stronger desires and expectations.

The present study aimed to validate the Japanese version of the AFCS. Collecting data from populations with different backgrounds, we performed a series of exploratory factor analyses

(EFAs) of which goodness-of-fit was compared in confirmatory factor analyses (CFAs). We then identified the factor structure with weak factorial invariance between men and women because we could not directly compare data obtained from men and women if the factor structure of the instrument was not the same between the two genders. Subscales of the AFCS were calculated based on these procedures and their internal consistency and test-retest reliability were examined. We examined correlates of the scores of these subscales. They include demographic data (gender, age, and education), marital status, desire for a baby, currently having or not having a child, current pregnancy, and fertility treatment. We expected more positive attitudes towards childbearing among married compared to unmarried people, people with higher education compared to those with lower education, those with children compared to those without, people currently expecting a child, and those undergoing fertility treatment compared to those who never received treatment for infertility.

2. METHODS

2.1 Participants and Procedures

We solicited men and women aged between 18 and 40 years in different groups to participate in this questionnaire survey. They included (a) students of a university in the Kanto area (n= 300), (b) public servants working for a city hall (n = 832) and employees of companies (n = 44), (c) couples under fertility treatment (n = 350 couples), (d) parents with children attending a nursery (n = 250 families), and (e) couples attending an antenatal clinic (n = 365 couples). Questionnaires were sent back to the chief researcher via mail in complete anonymity. The survey was conducted between April and June 2016. A total of 1149 (37%) participants returned the questionnaire.

Of these participants, 14 men and 31 women who worked for companies and 150 male and 150 female students of a university were asked to send a second questionnaire (of the same content) to the researcher as a means of test-retest reliability. The participants for the test-retest reliability part were asked to write a unique nickname (other than the real name) on the questionnaire on the two occasions so that we could match a set of questionnaires for each participant. A total of 398 second questionnaires were returned. They included 106 male and 114 female university students and 88 male and 92 female employees working for companies.

2.2 Measurements

2.2.1 Attitudes toward fertility and childbearing scale (AFCS)

The original version of the scale was translated into Japanese under permission from the original author. The Japanese version was retranslated back into English by a professional who was unaware of the original phrases so that the original author could verify the wording.

2.2.2 Other variables

The questionnaire asked the participant's (a) gender, (b) age, (c) education, (d) occupation, (e) marital status, (f) number of children and, if any, their ages, (g) fertility treatment, (h) desire to have a (another) child, and (i) desire, if unmarried, to marry.

2.3 Data Analysis

For exploratory and confirmatory factor analyses, we divided the sample randomly into two groups. In the first half of the group (n = 563), we performed an exploratory factor analysis (EFA) for the AFCS items. First, we examined means, SDs, and skewness of the AFCS items; factor extraction was performed using a maximum-likelihood method. The number of factors was determined by the scree plot method. It was rotated with Promax rotation, a diagonal rotation method.

In order to cross-validate the factor structure extracted through the EFA, we performed confirmatory factor analyses (CFAs) using the second half of the group (n = 586). Factor models were revised by adding correlations between error variables according to modification indices. These were added only to error variables belonging to the same factor. The fit of each model with the data was examined in terms of several indices: chi-squared (CMIN), comparative fit index (CFI), and root mean square error of approximation (RMSEA). We defined a good fit as CMIN/df < 2, CFI > 0.97, and RMSEA < 0.05, and an acceptable fit as CMIN/df < 3, CFI > 0.95, and RMSEA < 0.08 [14]. Having obtained a factor structure, we examined measurement invariance between men and women. This was because the AFCS may show a different factor structure between the two

genders. We examined if the instrument showed weak factorial invariance, where each factor loading should be the same between the groups. If the weak factor invariance was not confirmed, we deleted the path and indicator with the greatest critical ratio for difference of factor loading and repeated the examination until obtaining the weak factor invariance.

Reliability of each AFCS subscale was examined by internal consistency (Cronbach's alpha coefficient) and test-retest reliability (intraclass correlation coefficient: ICC).

From these results we created subscales of the AFCS. Each subscale was calculated by adding scores of items belonging to each factor. The scores of these subscales were correlated with demographic variables and compared between subgroups in terms of the marital status, education, having a chid/children, current expectancy for a baby, and fertility treatment.

When dealing with missing values, we adopted list-wise deletion for EFAs and CFAs. When analysing the whole data for validation of the AFCS subscales, we performed Little's Missing Completely At Random (MCAR) test and used multiple imputations.

All statistical analyses were performed using the SPSS version 20.

3. RESULTS

3.1 Factor Structure and Factorial Invariance

In the first half of the sample (n = 563), skewness of all the AFCS items was less than 2, indicating a fairly normal distribution (Table 1). Therefore, we entered all the AFCS items into EFAs without log transformation.

The scree plot suggested a 2- to 5-factor structure (Fig. 1 Some correlations between factors were moderate.

In order to determine which factor structure model was the best in describing the data, we performed a series of CFAs. The AIC was lowest (best) in the 5-factor structure model (Table 2). This model was also better than other models in terms of chi-squared/df, CFI, and RMSEA. We also performed a CFA using the 3-structure model proposed by the original author. This model however, did not exceed our 5-factor structure model in terms of goodness-of-fit indices. Because of moderate correlations between some factors, we examined goodness-of-fit of models with secondary factors (Table 2). None of them, however, exceeded the simple 5-factor model.

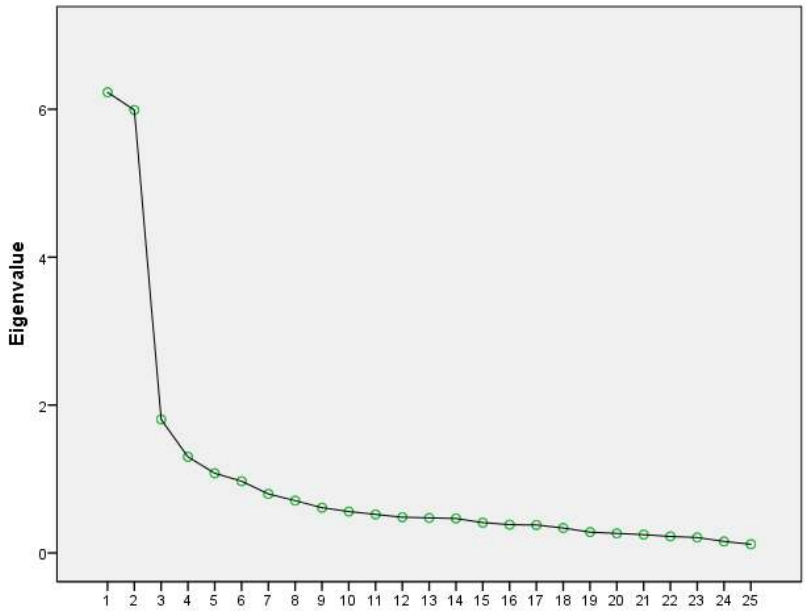


Fig. 1. Scree plot of the exploratory factor analysis of the AFCS items

Table 1. Exploratory factor analysis of AFCS items in a split-half sample (n = 563)

No.	AFCS items	Mean	SD	Skewness	Factor				
					1	2	3	4	5
3	Having children will develop me as a person	4.3	0.9	−1.6	0.94	0.05	0.00	−0.12	−0.08
6	Having a child is a way for me to add new elements in life	3.9	1.1	−0.8	0.76	−0.05	0.05	0.03	−0.00
1	I look forward to one day becoming a mother	4.1	1.0	−1.2	0.74	0.03	−0.09	−0.06	0.00
2	Having children is an essential part of life	4.0	1.1	−1.1	0.73	−0.17	0.07	0.12	0.01
5	I can imagine being pregnant and giving birth	3.8	1.2	−0.7	0.60	0.03	−0.21	−0.03	0.05
4	I find it hard to imagine living a life without children	3.5	1.2	−0.5	0.53	−0.18	0.03	0.09	0.13
25	When I have children, my life must be prepared for living with children	4.0	1.0	−1.1	0.45	0.30	0.02	0.10	−0.07
21	It is important for me to have my own stable economy when I have children	4.0	1.0	−1.0	**0.37**	0.30	0.14	0.13	−0.10
7	I talk to my friends about having children in the future	3.4	1.4	−0.4	**0.36**	0.05	−0.03	−0.02	0.32
17	Being a mother would take too much of my own time	3.3	1.2	−0.4	0.02	**0.90**	−0.09	−0.08	−0.00
19	Having children would limit socializing with my friends	3.1	1.1	−0.3	−0.07	**0.84**	−0.15	0.06	−0.09
18	Having children would limit my study opportunities	3.3	1.2	−0.5	−0.07	**0.83**	−0.06	0.06	−0.05
14	Having children would limit my leisure time activities	3.0	1.2	−0.1	0.06	**0.81**	0.00	−0.12	0.02
10	Having children would limit my life right now	3.0	1.2	−0.1	−0.02	**0.59**	0.12	−0.06	0.12
16	Having children would limit my career	3.3	1.2	−0.5	−0.26	**0.57**	0.15	0.13	0.13
11	An unplanned pregnancy would hinder me in my current life	3.3	1.2	−0.3	0.09	**0.39**	0.34	−0.08	0.05
20	It is important for me to choose when to get pregnant	2.5	1.3	0.3	0.21	**0.32**	0.26	0.12	−0.01
13	Taking responsibility for a child does not fit into my current life	3.2	1.2	−0.3	0.00	−0.02	**0.95**	−0.03	−0.02
12	Childbearing does not fit into my life right now	3.4	1.3	−0.4	−0.00	0.02	**0.91**	−0.09	−0.01
15	I do not want to take responsibility as a mother now	2.2	1.3	0.9	−0.16	0.06	**0.75**	0.11	−0.00
23	Being fertile is important for my identity as a woman	2.3	1.3	0.7	−0.01	0.00	−0.06	**0.84**	0.02
22	My fertility makes me feel communion with other women	2.0	1.2	1.0	−0.01	−0.07	0.06	**0.73**	−0.07
24	It is important to me that the child is born in a nuclear family ie mother, father, children	2.7	1.1	−0.1	0.12	0.05	−0.09	**0.53**	0.09
9	It is important for me to be about to get pregnant anytime	3.4	1.2	−0.3	0.02	−0.00	−0.02	0.01	**0.93**
8	It is important for me to be fertile	3.6	1.2	−0.7	0.22	0.05	0.01	−0.01	**0.74**

** P < 0.05; ** P < 0.01; *** P < 0.001 Factor loadings more than .3 are in bold*

Therefore, we considered that the AFCS consisted of five domains (Fig. 2). The items loaded on the first factor (factor loading > 0.3) included: “Having children will develop me as a person”, “Having a child is a way for me to add new elements in life”, and “I look forward to one day becoming a mother”. Hence, we named this factor Personal Development. The items loaded

on the second factor (factor loading > 0.3) incuded: “Being a mother would take too much of my own time”, “Having children would limit socializing with my friends”, and “Having children would limit my study opportunities”. Hence, we named this factor Restrictedness. The items loaded on the third factor (factor loading > 0.3) included: “Taking responsibility for a child does not fit into my current life”, “Childbearing does not fit into my life right now”, and “I do not want to take responsibility as a mother now”. Hence, we named this factor Avoidance of Responsibility. The items loaded on the fourth factor (factor loading > 0.3) included “Being fertile is important for my identity as a woman”, “My fertility makes me feel communion with other women”, and “It is important to me that the child is born in a nuclear family i.e. mother, father, children”. Hence, we named this factor Social Identity. Two items loaded on the final factor (factor loading > 0.3): “It is important for me to be about to get pregnant anytime”, and “It is important for me to be fertile”. We named this factor Importance.

The 5-factor structure, however, did not confirm weak factorial invariance between men and women. As compared with the model of no restriction, the model of restriction of each factor loading showed a statistically significant increase of the chi-squared value (chi-squared = 40.171, df = 20, $P < 0.01$). We then examined the critical ratios for differences between parameters one by one so that we could find the factor loading with the greatest difference between men and women. We found that this was Item 16. After deleting this item and repeating the same analysis, we confirmed weak factorial invariance.

Table 2. Comparison of different factor structure models of the AFCS (n = 586)

Models	Chi-squared/df	CFI	RMSEA	AIC
2-factor	3027.746/274 = 11.1	0.647	0.131	3179.746
3-factor	2170.178/272 = 8.0	0.756	0.109	2326.178
Original 3-factor	2727.606/272 = 10.0	0.685	0.124	2883.606
4-factor	1889.104/269 = 7.0	0.792	0.101	2051.104
5-factor	1483.996/265 = 5.6	0.844	0.089	**1653.996**
5-factor with secondary factor of F1 and F5	1493.252/267 = 5.6	0.843	0.089	1659.252
5-factor with secondary factor of F1, F4, and F5	1529.178/269 = 5.7	0.838	0.089	1691.178
5-factor with secondary factors of F1, F4, and F5 and of F2 and F3	1796.541/270 = 6.7	0.804	0.098	1956.541

The smallest AIC is in brackets

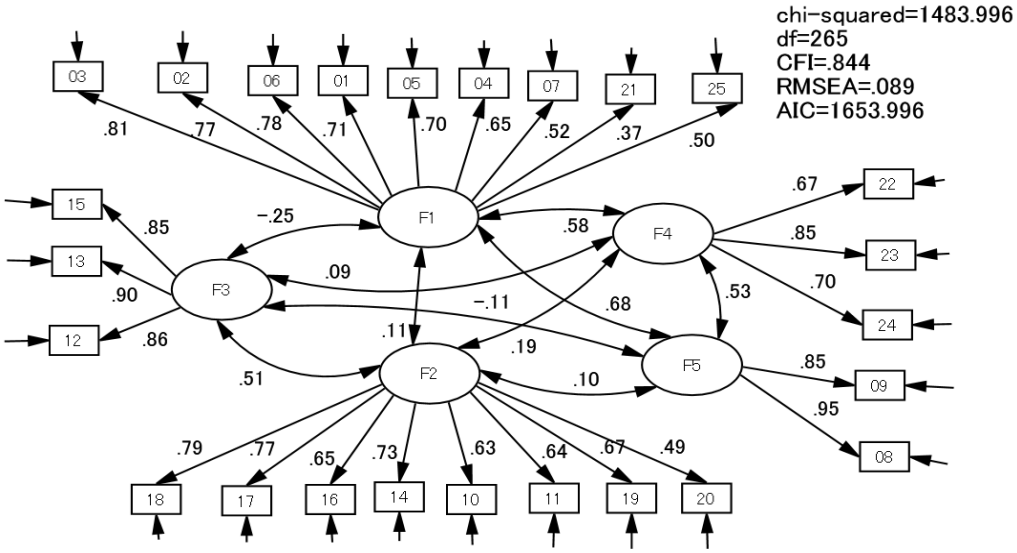


Fig. 2. Confirmatory factor analysis of the 5-factor model of the AFCS

The number of indicators represents the number of the AFCS item. All paths are standardised

3.2 Reliability

The internal consistency expressed by Cronbach's alpha coefficient was modest. The Cronbach's α coefficients of Personal Development, Restrictedness, Avoidance of Responsibility, Social Identity, and Importance in this study were 0.86, 0.86, 0.91, 0.77, and 0.90, respectively. Test-retest reliabilities of the five AFCS subscales were 0.82, 0.71, 0.80, 0.77, and 0.81, respectively (all *Ps* < 0.001). Test-retest reliability of the AFCS items ranged from 0.54 to 0.80 (all *Ps* < 0.001).

3.3 Construct Validity

Little's MCAR test showed a chi-squared value of 4134.5 ($P < 0.001$), thus the missing pattern of the present data was not missing completely at random.

The participants' age was significantly correlated with all the five AFCS subscale scores except for Importance (Table 3). As compared with men, women scored higher in Restrictedness and Importance. Hence, in the following analyses on the association of the AFCS subscale scores with different participant attributes, we performed a 2-way analyses of covariance with participants' gender as the second independent variable and age as a covariate.

As compared with unmarried people, married people scored significantly higher in Personal Development and Importance, but significantly lower in Restrictedness and Avoidance of Responsibility (Table 4). There was no main effect of marital status on Social Identity, whereas a significant interaction was found between marital status and gender (Fig. 4a). Thus, married men scored lower in Social Identity compared to unmarried men, whereas married women scored higher than unmarried women. Importance also exhibited an interaction between marital status and gender (Fig. 4b). Married and unmarried men did not differ in Importance, whereas married women scored higher in Importance than unmarried women.

Education showed main effects on Avoidance of Responsibility and Social Identity. Both were significantly higher among those with a highschool education than among those with a college or higher education (Table 4). There were no interactions.

Among married people, those who already had a child or children scored lower in Personal Development and Importance but higher in Restrictedness and Avoidance of Responsibility (Table 5). An interaction between child status and gender was found in the effect on Importance (Fig. 5). Thus, while Importance scores did not differ between men with and without children, it was higher among women without children than women with children (Fig. 5a).

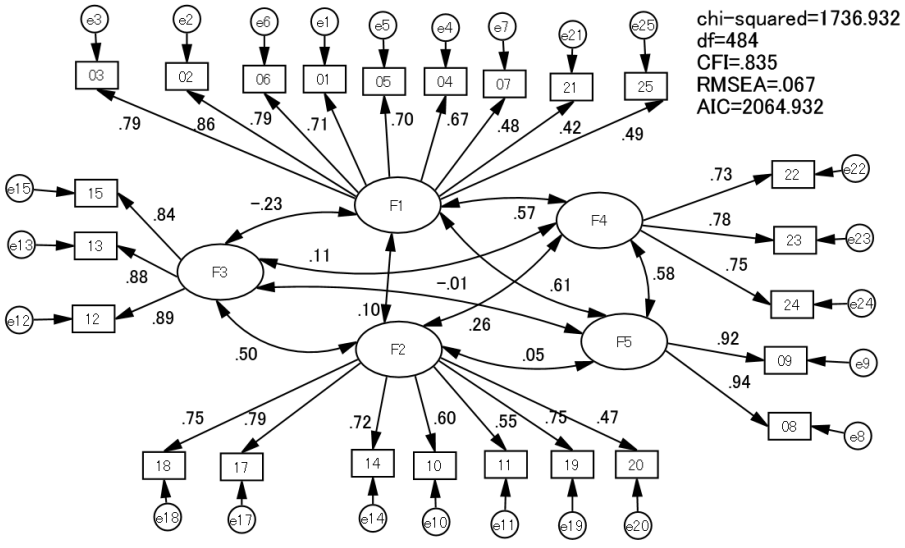


Fig. 3. Confirmatory factor analysis of the 5-factor model of the AFCS after model trimming
The number of indicators represents the number of the AFCS item. All paths are standardised

Table 3. Demographic features and the AFCS subscale scores (N = 1149)

	Personal development	Restrictedness	Avoidance of responsibility	Social Identity	Importance
Age	−0.09 **	−0.28 ***	−0.49 ***	−0.14 ***	−0.01
Gender					
Men (n = 545)	34.6 (0.3)	21.6 (0.3)	6.6 (0.1)	9.2 (0.1)	6.5 (0.1)
Women (n = 604)	34.9 (0.3)	23.5 (0.2)	6.7 (0.1)	9.2 (0.1)	7.5 (0.1)
t-test	0.8	5.1 ***	0.2	0.01	8.1 ***

*Figures for age were product moment correlation coefficients. Standard errors are in brackets. ** P < 0.01, *** P < 0.001*

Table 4. Correlates of the AFCS subscale scores in all participants (N = 1149)

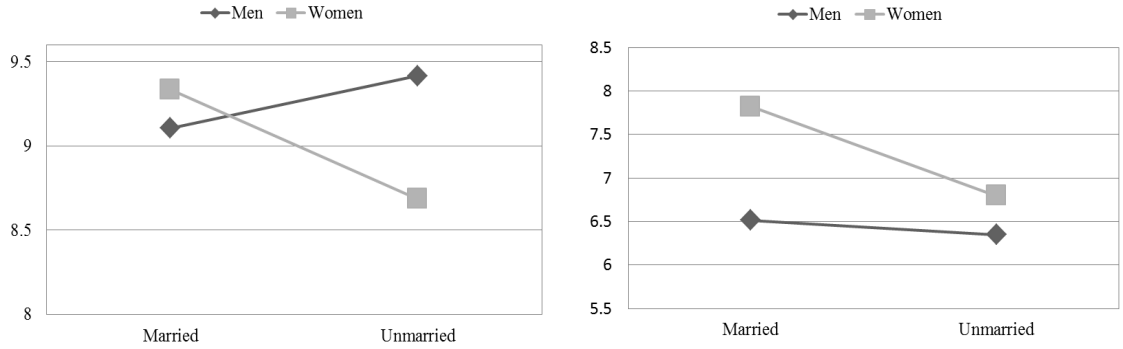
	Personal development	Restrictedness	Avoidance of responsibility	Social identity	Importance
Marital status					
Married (n = 816)	35.9 (0.3)	21.6 (0.2)	5.7 (0.1)	9.2 (0.1)	7.2 (0.1)
Unmarried (n = 333)	31.9 (0.5)	24.8 (0.4)	8.9 (0.2)	9.1 (0.2)	6.6 (0.2)
Main effect (F)	40.3 ***	32.8 ***	135.9 ***	0.5	7.4 **
Interaction (F)	2.4	0.7	2.0	6.8 **	8.7 **
Adjusted R^2	0.046	0.122	0.296	0.03	0.069
Education					
Highschool (n = 341)	34.8 (0.4)	22.3 (0.4)	7.3 (0.2)	9.6 (0.2)	6.9 (0.1)
College (n = 808)	34.7 (0.3)	22.7 (0.2)	6.4 (0.1)	9.0 (0.1)	7.0 (0.1)
Main effect (F)	0.0	0.9	14.0 ***	9.3 ***	1.1
Interaction (F)	0.0	0.5	1.7	3.0	1.0
Adjusted R^2	0.008	0.098	0.219	0.028	
Desire of having a (another) child	r = 0.39 ***	r = 0.01	r = −0.06	r = 0.20 ***	r = 0.31 ***

*Standard errors are in brackets. * P < 0.05, ** P < 0.01, *** P < 0.001*

Table 5. Correlates of the AFCS subscale scores in married participants (n = 798)

	Personal development	Restrictedness	Avoidance of responsibility	Social Identity	Importance
With/without children					
With child/children (n = 480)	34.4 (0.3)	21.9 (0.3)	5.8 (0.1)	8.9 (0.1)	6.9 (0.1)
Without a child (n = 318)	36.2 (0.4)	20.6 (0.4)	5.1 (0.2)	9.2 (0.2)	7.3 (0.1)
Main effect (F)	10.6 **	7.5 **	8.4 **	2.3	4.7 *
Interaction (F)	1.2	0.9	0.0	1.7	8.4 **
Adjusted R^2	0.02	0.04	0.014	0.01	0.100
Presently pregnant					
Not pregnant (n = 483)	36.6 (0.3)	21.1 (0.3)	4.9 (0.1)	9.0 (0.1)	7.3 (0.01)
Pregnant (n = 315)	33.0 (0.4)	21.8 (0.3)	6.4 (0.1)	9.1 (0.2)	6.7 (0.1)
Main effect (F)	60.3 ***	2.1	60.2 ***	0.1	57.3 ***
Interaction (F)	3.3	1.3	10.6 **	1.1	31.3 *
Adjusted R^2	0.08	0.03	0.08	0.01	0.11
Fertility treatment					
Current treatment (n = 192)	36.5 (0.5)	19.6 (0.4)	4.5 (0.2)	9.4 (0.2)	7.5 (0.2)
Past treatment (n = 106)	35.5 (0.6)	21.2 (0.6)	4.8 (0.3)	8.9 (0.3)	7.1 (0.2)
Never treated (n = 500)	34.5 (0.3)	22.1 (0.3)	5.9 (0.1)	8.9 (0.1)	6.9 (.01)
Main effect (F)	6.6 ***	12.3 ***	16.6 ***	2.6	5.1 ***
Interaction (F)	0.5	0.3	1.5	2.4	8.7 ***
Adjusted R^2	0.02	0.05	0.04	0.01	0.11
	CT > NT	CT < NT	CT < NT	---	CT > NT

*Standard errors are in brackets. * P < 0.05, ** P < 0.01, *** P < 0.001*



(a) Social Identity **(b) Importance**

Fig. 4. Interaction of variables among the whole sample

As compared with people who were not expecting, people who were expecting scored higher in Avoidance of Responsibility but lower in Personal Development and Importance (Table 5). An interaction between expectancy and gender was found in Avoidance of Responsibility and Importance (Fig. 5). Thus, men whose partners were expecting as compared with those men whose partners were not expecting scored higher in Avoidance of Responsibility, but women who were and were not expecting did not differ substantially (Fig. 5b). Importance scores were higher for women not expecting than for expecting women. They were virtually the same in men regardless of whether they were expecting or not (Fig. 5c).

People who were currently under fertility treatment compared to those who had never been treated for infertility scored significantly higher in Personal Development and Importance, but significantly lower in Restrictedness and Avoidance of Responsibility (Table 5). An interaction between fertility treatment and gender was found in Avoidance of Responsibility and Importance. Thus, women who had never been treated for infertility scored higher in Avoidance of Responsibility than women currently under fertility treatment, while men currently under fertility treatment scored slightly higher in Avoidance of Responsibility (Fig. 5d). Men did not differ in Importance regardless of treatment status, whereas women currently under fertility treatment scored higher in Importance (Fig. 5e).

4. DISCUSSION

Our data indicate that the Japanese AFCS consisted of five factors: Personal Development, Restrictedness, Avoidance of Responsibility, Social Identity, and Importance. Personal Development, Social Identity and Importance may be positive aspects of attitudes towards childbearing while Restrictedness and Avoidance of Responsibility may be negative. Some of these factors were moderately inter-correlated, but CFAs indicated that they were independent facets of childbearing attitudes.

Although the original authors' component analysis showed a 3-component structure, our model comparison clearly showed that a 5-factor structure was the most robust one according to the AIC. Although we attempted to improve goodness-of-fit by conducting secondary factor analyses, they failed to show better fit of the model with the data. The 3-factor structure derived from the original authors also failed to exceed our 5-factor model in terms of the AIC. The contents of items belonging to each factor were clinically interpretable. Also important is the measurement invariance of the model between men and women. This was achieved by deleting only one item (item 16). This is a promising indication that we can use the instrument for women as well as men with the same factor model in future research.

Gender differences were found in two subscales. Women perceived childbearing as more restricting on their life, but also more important. Advanced age was associated with less negative, but also less positive, childbearing attitudes. Older people may have *weaker* perceptions regarding childbearing.

As expected, married people viewed childbearing more positively and less negatively than unmarried people. People with more positive attitudes towards childbearing desired a (another) child. Among married people, those who had not yet had a child were more positive

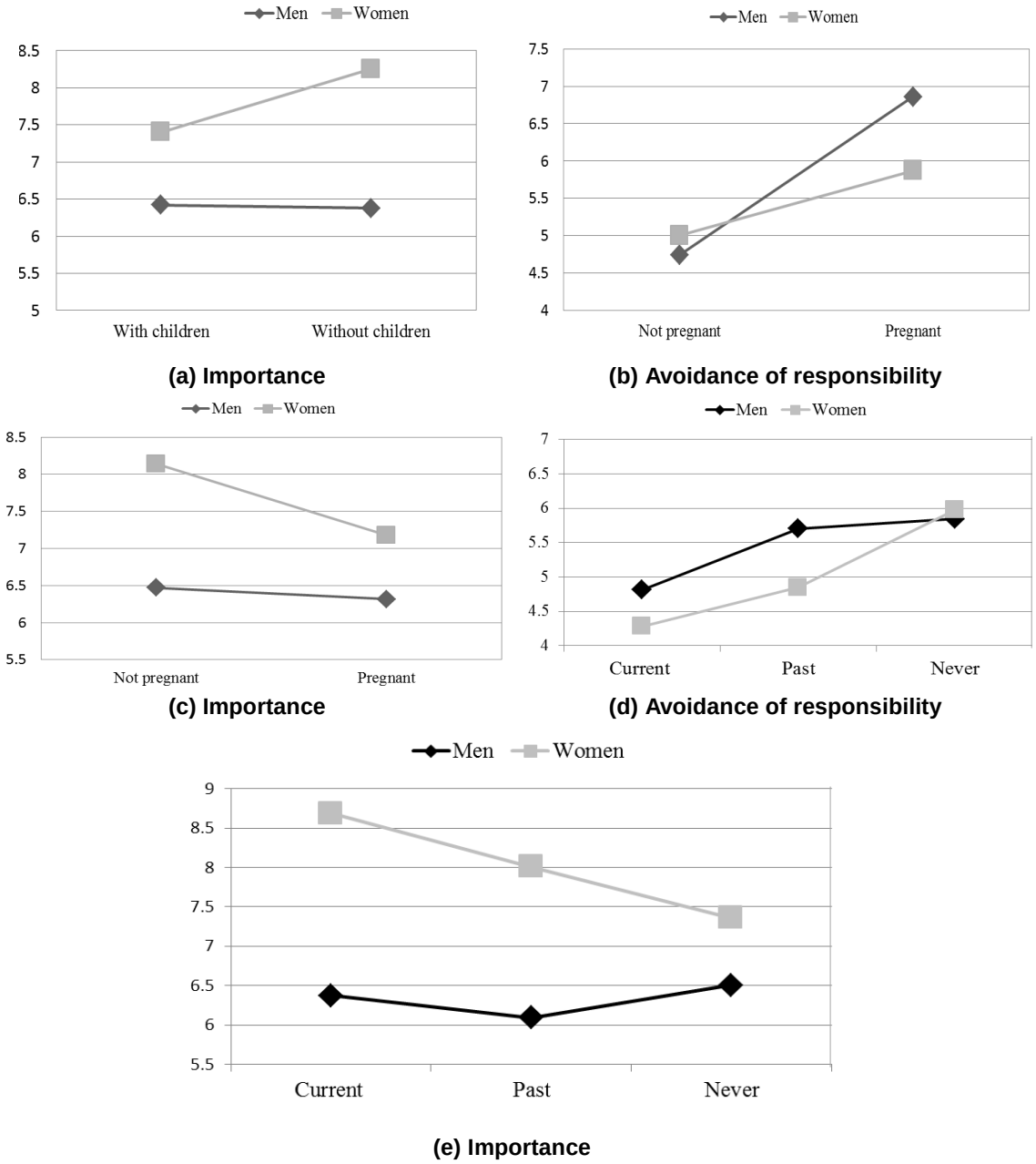


Fig. 5. Interaction of variables in married people

in their childbearing attitudes. Expecting couples were *more negative* and *less positive* in childbearing attitudes. These findings may reflect the wish to have a child among those without children and not expecting a child. On the other hand, those who had already had a child/children may be more realistic and less enthusiastic. Couples currently under fertility treatment were more positive and less negative in childbearing attitudes.

We also found interactive terms between gender and attributes of the participants on childbearing attitudes. Thus, only among women, married status enhanced their perception of childbearing as a sign of social self-identity and importance. Among married people, only women felt childbearing more important if they did not have a child. Women also felt childbearing more important if not pregnant. Men felt like avoiding responsibility when their partner was pregnant.

As compared to men, women were more likely to view childbearing as important and less avoidant of responsibility when they were currently being treated for infertility. In sum, these findings indicate that women are more enthusiastic, while men are more hesitant, towards childbearing.

Limitations of the present study should be noted. The present study was based on a questionnaire survey. Data collected from interviews may give a different picture. Responses to questions like ones presented in the AFCS may be biased by social desirability. Further, caution should be exercised in interpreting the data.

5. CONCLUSION

Despite shortcomings of the research methodology, we feel the Japanese version of the AFCS is a reliable and a valid measure of women's as well as men's attitudes towards childbearing.

CONSENT

All authors declare that written informed consent was obtained from every participant of this study separately from the questionnaire in order to guarantee the anonymity of the response to the questionnaire.

ETHICAL APPROVAL

The research protocol was approved by the Ethical Review Board of Juntendo University Faculty of Medicine. The participants were provided with written explanations of the purpose and procedures of the study.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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