Testing the Role of Fish Consumption Intention as Mediator

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Abstract: This research investigate the role of an intention to consume fish as mediating variables between six variables (three variables from theory of plan behaviour and others from (Tomic, Matulic, and Jelic 2016). Theory of plan behaviour is applied to understand the phenomena's. The data is analysed using the structural equation model (SEM). The finding show that an intention to consume fish is succeeding in mediating relationship between attitude toward fish consumption and consumption behaviour. However, the effect of other variables (subjective norm, perceived behavioural control, healthy, availability and responsibility) on consumption behaviour is not successfully mediated by an intention to consume fish. This study has theoretical and practical implication and they are discussed in this paper.

1 BACKGROUND OF STUDY

Consumption of sea food has been varying substantialyacross countries, family and individually (Olsen 2004).In country level, European country consume fish 20 kg per capita and 39 kg in Indonesia (Tran et al. 2017). In addition, Olsen (2003) identified the stream of research regarding to the individual fish consumption behaviour: socio-economics and demographic perspectives, and psychologicalperspective. From psychological perspective, food consumption behaviour and choice is explained by psychological constructs, such as social norm, belief, attitude, motivation, knowledge and other psychological variables (Shepherd and Raats 1996). Fish consumption has several reasons, such as diet, nutrition, and etc.(Carlucci et al., 2015). In fact, fresh fish consumption at least twice a week have a positively effect on health (Sioen et al., 2008). The research question regarding to the fish consumption behaviour is why the fish consumption behaviour varies.

There are several previous researches investigating the fish consumption behaviour among individual (Tomić et al., 2016; Badr et al., 2015; Thorsdottir et al., 2012; Murray et al., 2017; Khan et al., 2018; Birch and Lawley, 2012; Milošević et al., 2012; Cardoso et al., 2013; Grieger et al., 2012). From the previous studies, there is a lack of studies investigating the fish consumption behaviour using the Indonesia's data. further, there is limited studies determining the role of an intention to consume fish as mediating variable between attitude, subjective norm, perceived behavioural control (Ajzen, 1991) and other variables are being tested by (Tomic, Matulic, and Jelic 2016): healthy, availability and responsibility. Therefore, this study investigates the mediating role of an intention to consume fish between six variables and consumption behaviour. Therefore, we test six hypotheses:

H1: Intention to consume fish mediate the relationship between attitude and fish consumption behaviour

H2: Intention to consume fish mediate the relationship between subjective norm and fish consumption behaviour

H3: Intention to consume fish mediate the relationship between perceived behaviour control and fish consumption behaviour

H4: Intention to consume fish mediate the relationship between healthy and fish consumption behaviour

H5: Intention to consume fish mediate the relationship between availability and fish consumption behaviour

H6: Intention to consume fish mediate the

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relationship between responsibility and fish consumption behaviour

This paper is organised into four sessions. First session is discussed about the research background. Method and material is in second session. It is followed finding and discussion as third session. Finally, this paper is closed by conclusion and recommendations.

2 METHOD AND MATERIAL

Academics staffs working in private university in Padang is research object. There are 301 questioners distributed to respondent, 18.27% of respondents returned the questioner. Primary data is applied by using survey method (on-line). There are three type of latent variables used here: latent dependent variable (fish consumption behaviour), latent independent variables (attitude toward fish consumption, availability, fish consumption behaviour, healthy, perceived behavioural control, responsibility, and subjective norm), and latent mediating variable (intention to consume fish). Fish consumption behaviour refers to how often respondent consume fish the last few month (Tomic, Matulic, and Jelic 2016). In addition, intention to consume fish has two items adopted from (Ajzen 1991). Further, attitude toward fish consumption is measured by five items where two items adopted from (Tomic, Matulic, and Jelic 2016) and other three items was taken from (Verbeke and Vackier 2005). Thus, subjective norm has four items suggested by (Verbeke and Vackier 2005). Moreover, perceived behaviour control is measured by three items taken from (Verbeke and Vackier 2005).

Healthy (involvement in health) has three items taken from (Altintzoglou et al., 2011). Fish availability is measured by three items from (Myrland et al., 2000). Finally, three item is used to measure the responsibility (moral obligation) taken from (Verbeke and Vackier, 2005). All constructs are assessed using the 5-point Likert scale (1=strongly disagree, 5=strongly agree). SEM-PLS is applied to analyse the research data (Chin 1998; Vinzi et al. 2010). In this case, smart-pls is used (Hair et al.,). Two assessment is conducted to gain the confirmed measurement model and rigorous structural model (J. Hair et al. 2014). In measurement model, we have to assess two types of validity: convergent validity and discriminant validity (J. F. Hair et al. 2013). Structural model is aimed for test the relationship (Joseph F Hair et al. 2017). Mediation role is tested using (Zhao et al., 2010)'s mechanism.

3 RESULT AND DISCUSSION

3.1 Demographic Data

Data demography is classified into four types: gender, age, position and income. figure 1 show respondentgender and age. Regarding to respondent age, 49% of respondent is female and the rest is male (51%). In addition, respondent with age of 26-30-year-old is about 5%. Thus, 20% of respondent is with age of 36-40 years old. Further, respondent with age of 36-40 years old is 5% and followed by 35% of respondent with age of 41-50 years old. Moreover, respondent with age more than 50 years old is 35%. On other two demographic data

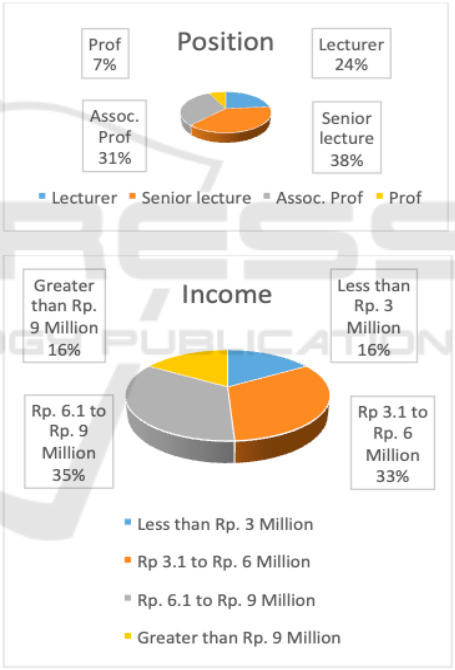

Figure 1: Demographic data: gender and Age

is respondent career position and income. Figure 2 provide us with the percentage of position and income of respondents. There are four type of lecture position: lecturer (24%), senior lecturer (38%), associate professor (31%) and professor(7%). In addition, respondent with income of less than Rp. 3 million is 16% and followed by 33% respondent with income of Rp. 3.1- Rp. 6 million. Thus, respondent with Rp. 6.1 –Rp. 9 million of income is 35% and finally 16% respondent is with income of more than Rp. 6 million.

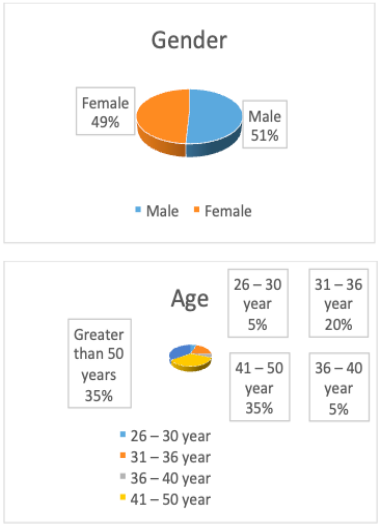

Figure 2: Demographic Data: Position And Income

Table 1: Measurement Model Assessment Convergent validity

construct	Item	OL	CA	CR	AVE
attitude toward fish	atf1	0.94	0.94	0.96	0.81
	atf2	0.91			
	atf3	0.83			
	atf4	0.93			
	atf5	0.9			
availability	ava1	0.87	0.89	0.91	0.79
	ava2	0.81			
	ava3	0.96			
fish con beh	fcb	1	1	1	1
healthy	h1	0.88	0.79	0.87	0.7
	h2	0.76			
	h3	0.87			
intention to consume fish	icf1	0.99	0.98	0.99	0.97
	icf2	0.98			
	icf3	0.98			
subjective norm	nor1	0.9	0.86	0.9	0.71
	nor2	0.73			
	nor3	0.9			
	nor4	0.81			
perceived behaviour control	pbc1	1	1	1	1
responsibility	res1	0.95	0.94	0.96	0.9
	res2	0.97			
	res3	0.92			

3.2 Measurement Model Assessment

as mention in the previous session, there are two assessments while using smart-pls: measurement model assessment and structural model assessment(Joseph F Hair et al. 2017). Table 1 demonstrate the result of measurement model assessment for convergent validity. There are four smart-pls properties used here: outer loading, Cronbach's alpha, composite reliability and average variance extracted (AVE). All items have an outer loading greater than 0.700 for first algorism, except for item of perceived behavioural control (pbc2, and pbc3). Having deleted these two items, the second algorism has been run and thereafter, all items have an outer loading greater than 0.700. therefore, it reached the convergentvalidity requirement (Hulland 1999). Second convergent validity assessment is Cronbach's Alpha (CA) and Composite reliability (CR) and their value must exceed 0.700 (Bagozzi and Yi, 1988). As indicated by value of CA and CR (5th and 6th Colum), their values are above the smart-pls requirement: above 0.70. Finally, average variance extracted (AVE)'s value should be greater than 0.500. the result show that all constructs have AVE's value above 0.500 and therefore, it can be concluded that it achieves the cut off value.

Discriminant validity is the second assessment for measurement model. There are three type of assessment for discriminant validity: Fornell-Lacker criterion (Fornell and Larcker, 1981), cross loading (Jorg Henseler, Ringle, and Sinkovics 2009) and Heterotrait-Monotrait ratio (Jörg Henseler, Ringle, and Sarstedt 2015). Table 2 demonstrate the result of discriminant validity using Fornell-Lacker criterion. Square root AVE of a construct should be higher than the correlation between that construct with other construct. For example, square root AVE of ICF (0.984) is greater than its correlation with other construct (0.517 with ATF, 0.032 with AVA and etc). Therefore, it can be concluded that discriminant validity requirement using Fornell-Lacker criterion is achieved (Fornell and Larcker, 1981).

Table 2: Measurement Model Assessment Discriminant validity-Fornel-Lacker Criterion

cons	ICF	ATF	AVA	FCB	H	PBC	RES	NOR
ICF	**0.98**							
ATF	0.52	**0.9**						
AVA	0.03	0.12	**0.88**					
FCB	0.43	0.72	-0.07	**1**				
H	0.25	0.63	0.09	0.38	**0.84**			
PBC	0.17	0	0.31	-0.05	-0.17	**1**		
RES	0.28	0.63	0.09	0.5	0.52	-0.05	**0.95**	
NOR	0.23	0.57	0.21	0.41	0.54	-0.13	0.76	**0.84**

Note: ICF (intention to consume fish), ATF (attitude toward fish consumption), AVA (avalaibality), (FCB) fish consumption behaviour, H (healthy), PBC (perceived behavioural control), RES (responsibility), and NOR (subejctive norm).

Second assesment for discriminant validity is cross loading (Wong 2013). The result of cross-loading can be seen in Table 3 below.The cross-loading refers to loading an indicator should be higher to its assigned construct (Jorg Henseler, Ringle, and Sinkovics 2009). For example, items for ICF construct is higher loading to ICF (bold) compared to other construct (non-bold). It also happens to other items. Therefore, the discriminant validity using cross-loading is reached.

Table 3: Measurement Model Assessment Discriminant validity-Cross Loading

Items	ICF	AVA	FCB	H	ICF	PBC	RES	NOR
atf1	**0.94**	0.08	0.72	0.61	0.54	-0.03	0.54	0.5
atf2	**0.91**	0.02	0.7	0.52	0.49	0	0.51	0.41
atf3	**0.83**	0.2	0.56	0.6	0.36	0.1	0.57	0.48
atf4	**0.93**	0.17	0.62	0.58	0.45	0.01	0.65	0.61
atf5	**0.9**	0.19	0.63	0.53	0.43	-0.05	0.59	0.57
ava1	0.1	**0.87**	0.01	0.16	0.02	0.2	0.11	0.21
ava2	0.17	**0.82**	-0.02	0.21	0.01	0.32	0.17	0.23
ava3	0.11	**0.96**	-0.1	0.03	0.04	0.33	0.06	0.19
fcb	0.72	-0.07	**1**	0.38	0.43	-0.05	0.5	0.41
h1	0.56	0.1	0.3	**0.88**	0.23	0.02	0.52	0.45
h2	0.41	-0.07	0.29	**0.76**	0.18	-0.3	0.24	0.4
h3	0.58	0.16	0.38	**0.87**	0.23	-0.17	0.51	0.5
icf1	0.52	0.03	0.41	0.29	**0.99**	0.14	0.29	0.24
icf2	0.49	0.02	0.42	0.22	**0.98**	0.19	0.27	0.21
icf3	0.51	0.04	0.44	0.24	**0.98**	0.17	0.27	0.23
nor1	0.53	0.21	0.34	0.48	0.21	-0.18	0.71	**0.9**
nor2	0.45	0.29	0.38	0.47	0.17	-0.04	0.55	**0.73**
nor3	0.51	0.13	0.4	0.38	0.18	-0.16	0.72	**0.9**
nor4	0.41	0.1	0.28	0.51	0.2	-0.04	0.56	**0.81**
pbc1	0	0.31	-0.05	-0.16	0.17	**1**	-0.05	-0.13
res1	0.59	0.03	0.46	0.5	0.27	-0.03	**0.95**	0.71
res2	0.62	0.08	0.51	0.53	0.32	-0.11	**0.97**	0.74
res3	0.58	0.16	0.45	0.45	0.19	0.04	**0.92**	0.71

Note: ICF (intention to consume fish), ATF (attitude toward fish consumption), AVA (availability), (FCB) fish consumption behaviour, H (healthy), PBC (perceived behavioural control), RES (responsibility), and NOR (subjective norm).

Third assessment for discriminant validity is Heterotrait-Monotrait ratio (HTMT). The ratio is resulted from average heterotrait-heteromethod correlations relative to the average monotrait-heteromethod correlation (Jörg Henseler, Ringle, and Sarstedt 2015; Joseph F Hair et al. 2017). (Kline 2011) argue that HTMT ratio below 0.85 indicate that discriminant validity is achieved. Table 4 provide us with the result of Heterotrait-Monotrait ratio and all values are below 0.85 and it can be concluded that discriminant validity is achieved.

Table 4: Measurement Model Assessment Discriminant validity- Heterotrait-Monotrait ratio (HTMT)

cons	ICF	ATF	AVA	FCB	H	PBC	RES	NOR
ATF								
AVA	0.16							
FCB	0.74	0.05						
H	0.72	0.21	0.43					
ICF	0.53	0.03	0.44	0.29				
PBC	0.04	0.33	0.05	0.22	0.17			
RES	0.67	0.14	0.52	0.58	0.28	0.06		
NOR	0.64	0.27	0.45	0.65	0.25	0.13	0.84	

Note: ICF (intention to consume fish), ATF (attitude toward fish consumption), AVA (availability), (FCB) fish consumption behaviour, H (healthy), PBC (perceived behavioural control), RES (responsibility), and NOR (subjective norm).

3.3 Structural Model Assessment

Having assessed the measurement model, assessment for structural model is conducted. Structural model assessment is for hypothesis testing and deals with relationship between latent variables(Joseph F Hair et al. 2017). before testing for hypothesis, it first looks for predictive relevant and predictive power of model. Q square is used to see the predictive relevance of model and its value should be higher than 0.000. both endogenous constructs have Q square above 0.000. in fact, FCB and ICF have Q square 0.113 and 0.254 respectively. Therefore, they are classified as medium predictive relevance (Jorg Henseler, Ringle, and Sinkovics 2009). Second, R square is used to see the predictive power of structural model. The value of R square is 0.174 and 0.222 for FCB and ICF respectively. Thus, predictive power is below 0.33 and it is categorised as weak predicative power (Chin 1998).

Table 5: Assessment of Structural Model

endogenous construct	Q square	decision	R square	decision
FCB	0.11	Medium	0.17	Weak
ICF	0.25	Medium	0.22	Weak
relationship	Coef.	t stat	p value	decision
ATF $->$ ICF	0.59	3.3	0.00***	supported
AVA $->$ ICF	-0.09	0.52	0.6	not supported
H $->$ ICF	-0.05	0.36	0.722	not supported
ICF $->$ FCB	0.43	3.44	0.00***	supported
PBC $->$ ICF	0.19	1.38	0.17	not supported
RES $->$ ICF	-0.04	0.26	0.8	not supported
NOR $->$ ICF	0	0.01	0.99	not supported

Note: ICF (intention to consume fish), ATF (attitude toward fish consumption), AVA (availability), (FCB) fish consumption behaviour, H (healthy), PBC (perceived behavioural control), RES (responsibility), and NOR (subjective norm).

the significant determinants of fish consumption intention are attitude toward fish consumption (β=0.587, p-value=0.001). other variables (AVA, H, PBC, RES, and NOR) do not have a significant effect on fish consumption intention due to their p value above 0.05. In addition, fish consumption intention has a significant relationship with fish consumption behaviour (β=0.434, p-value=0.001). therefore, the higher the fish consumption intention, the greater fish consumption behaviour. Figure 4 show the structural model.

To answer whether fish consumption intention mediating relationship between determinants and fish consumption behaviour, the assessment of direct effect and indirect effect are conducted. Table 6 demonstrate the result of direct effect and out of six determinants, only attitude toward fish consumption has a significant relationship with fish consumption behaviour (β=0.702, p-value=0.000). thus, it means that the higher the attitude toward fish consumption, the higher fish consumption behaviour. Other variables do not have a significant effect due to their p value above 0.05.

Next analysis is indirect effect assessment. There are six indirect effect are assessed and only indirect effect (ATF$->$ICF$->$FCB) has a positive effect

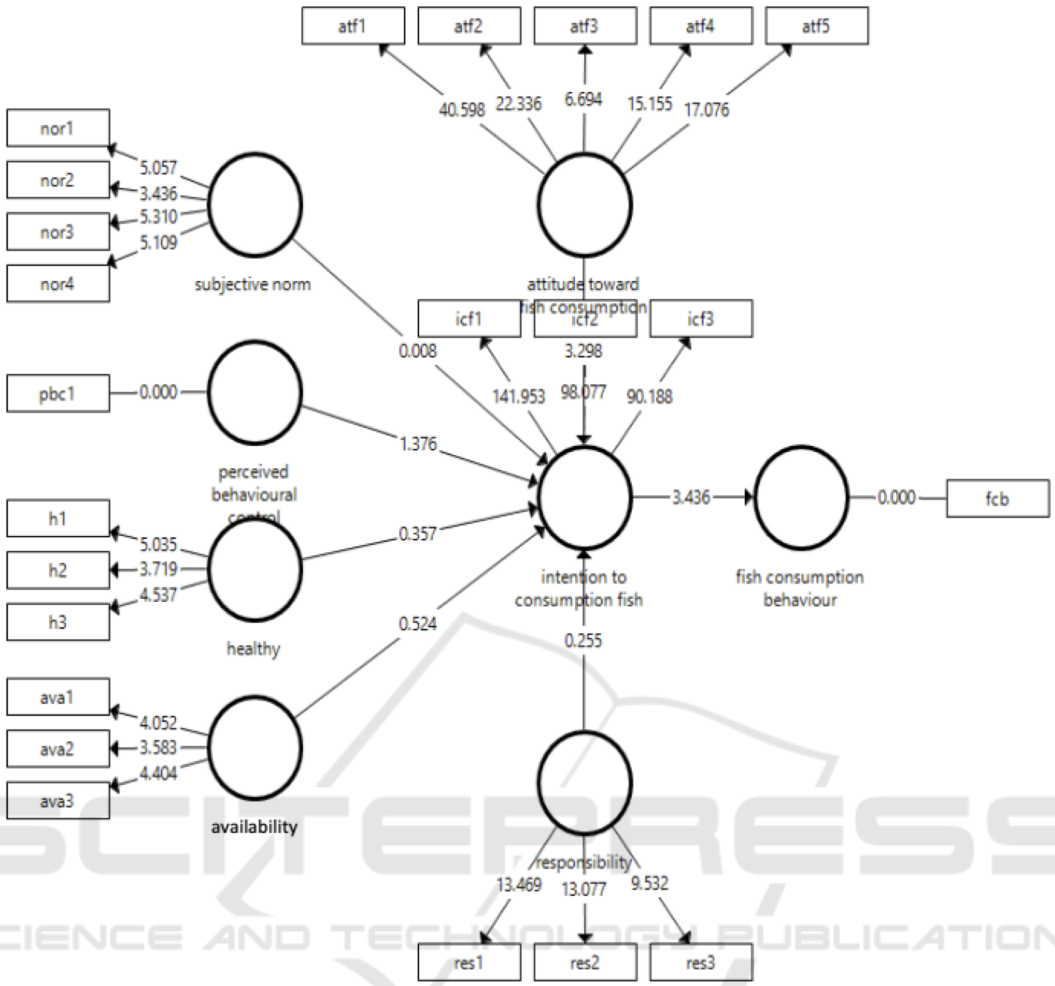

Figure 3: Structure Model

Table 6: Assessment of direct effect

direct effect	coef.	t stat	p value	decision
ATF – > FCB	0.7	3.63	0.00***	supported
AVA – > FCB	-0.19	1.55	0.12	not supported
H – > FCB	-0.13	0.93	0.36	not supported
PBC – > FCB	-0.02	0.15	0.88	not supported
RES – > FCB	0.09	0.5	0.62	not supported
NOR – > FCB	0.04	0.26	0.8	not supported

Note: ICF (intention to consume fish), ATF (attitude toward fish consumption), AVA (availability), (FCB) fish consumption behaviour, H (healthy), PBC (perceived behavioural control), RES (responsibility), and NOR (subjective norm).

(β=0.255, p-value=0.058) at α=10% (see table 7). Other variables have p value above 0.05. (Zhao, Lynch, and Chen 2010) argue that there should be only one requirement to establish (i.e. indirect effect (axb) is significant) and it does not need for significant effect to be mediated (path c). However, if its indirect effect and direct effect are significant and they have same direction, the mediation is fallen into complementary mediation(Zhao, Lynch, and Chen 2010). In this case, direct and indirect effect are significant and they have the same direction (positive) and we can conclude that there is a complementary mediation role of fish consumption intention (ICF) between attitude toward fish consumption (ATF) and fish consumption behaviour (FCB). Figure 4 provide us with complex structural model of research.

Table 7: Assessment of indirect effect

indirect effect	Coef.	t stat	p value	decision
ATF – > ICF – > FCB	0.26	1.9	0.06*	supported
AVA – > ICF – > FCB	-0.04	0.52	0.6	not supported
H – > ICF – > FCB	-0.02	0.34	0.73	not supported
PBC – > ICF – > FCB	0.08	1.49	0.3	not supported
RES – > ICF – > FCB	-0.02	0.24	0.81	not supported
NOR – > ICF – > FCB	0	0.01	0.99	not supported

Note: ICF (intention to consume fish), ATF (attitude toward fish consumption), AVA (availability), (FCB) fish consumption behaviour, H (healthy), PBC (perceived behavioural control), RES (responsibility), and NOR (subjective norm).

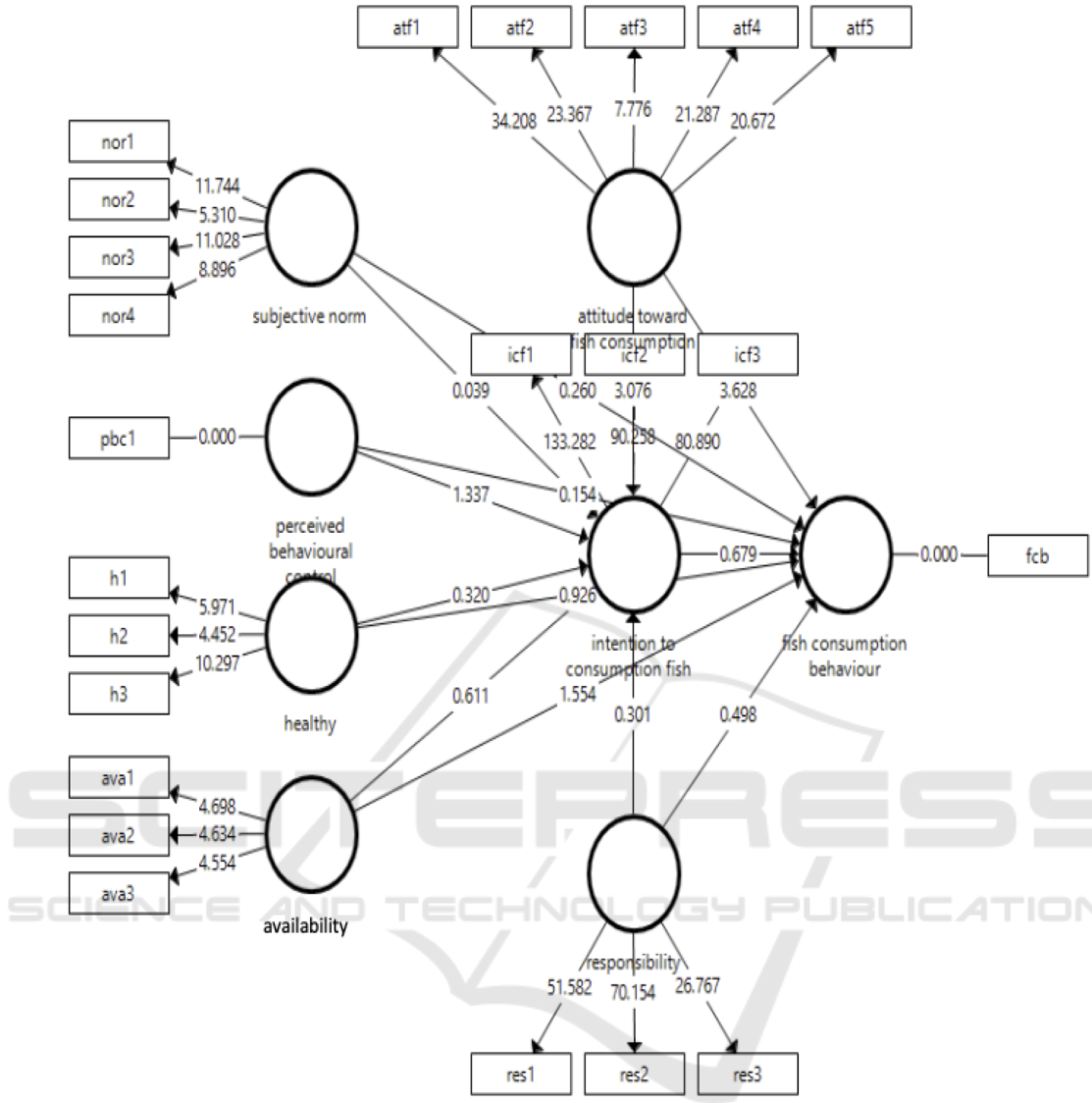

Figure 4: Structure Model

4 CONCLUSION AND RECOMENDATION

The important of fish has been documented by several experts. Due to benefit of fish, studies investigating factor effected fish consumption behaviour has been largely done. However, there is a limited study investigating using Indonesia's data. In fact, there is also lack of studies determine the role of an intention to consume as mediating variables between antecendents of intention to consume fish (attitude, norm, perceived behavioural control, healthy, availability, and responsibility) and consuming behaviour. The finding show that intention to consume fish is succesfully mediated the relationship between attitude toward fish consumption and fish consumption behaviour.

5 CONCLUSIONS

Process integration has a fairly high risk and can have an impact on objectives. Therefore, it is necessary to mature planning and identify the risks that may occur either during management system process integration.The identified risks must be managed by defining their causes and impacts. Once known cause and impact, it can be proposed

preventive measures to prevent occurrence and corrective action in response if the impact occurs.

Based on this study, there are 10 highest risks in management system process integration and 5 risks occuring in scope component/clause.

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