



## **Socio-psychological factors influencing upgrading intentions in smallholder pig value chain: A study based on application of Theory of Planned Behaviour**

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### **ABSTRACT**

Despite increased application of behavioural approaches in agricultural contexts, upgrading behaviour of smallholder farmers and traders still receives minimal attention in development of agricultural value chains. This study pays attention to antecedents of upgrading behaviour in smallholder pig value chains, by identifying factors influencing upgrading intention and examines how Theory of Planned Behaviour (TPB) is useful in determining the upgrading intention. A cross-sectional study was conducted with men and women selected from four pig-related enterprises, i.e., pig farming, pig selling, pork distribution, and pork retailing. Semi-structured interviews were conducted with 296 individuals, randomly selected from pig-producer communities in Masaka district of Uganda. The intention to upgrade the model was developed based on TPB and estimated using survey data. Principle component analysis and hierarchical regression were performed to identify the most important components of the TPB model and socio-psychological factors necessary for upgrading intention in pig value chains. Results reveal that the individuals' beliefs about outcomes of upgrading and resources they access, have significant positive influence; while household members have significant negative influence on the individual's intention to upgrade. Practically, this finding could be useful in understanding the behaviour of farmers and other actors in agricultural value chains. Theoretically, this study advances the methodology and application of TPB model for agricultural value chain development, by providing a set of questionnaire items that could be used for future behavioural studies in various social contexts.

**Key words:** Gender, pig value chain, theory of planned behaviour, Uganda, upgrading

### **RÉSUMÉ**

Malgré l'application accrue d'approches comportementales dans les contextes agricoles, l'amélioration du comportement des petits exploitants agricoles et des commerçants reçoit encore peu d'attention dans le développement des chaînes de valeur agricoles. Cette étude s'intéresse aux antécédents du comportement de mise à niveau dans les chaînes de valeur porcines des petits exploitants, en identifiant les facteurs influençant l'intention de mise à niveau et examine comment la Théorie du Comportement Planifié (TCP) est utile pour déterminer l'intention de mise à niveau. Une étude transversale a été menée auprès d'hommes et de femmes sélectionnés dans quatre entreprises liées au porc, à savoir l'élevage porcin, la vente de porc, la distribution de porc et la vente au détail de porc. Des entretiens semi-structurés ont été menés

auprès de 296 personnes, sélectionnées au hasard dans les communautés de producteurs de porcs des districts de Masaka et de Lira en Ouganda. Un modèle d'intention de mise à niveau a été développé sur la base du TCP et estimé à l'aide de données d'enquête. Une analyse des composants principaux et une régression hiérarchique ont été effectuées pour identifier les composants les plus importants du modèle TCP et les facteurs socio-psychologiques nécessaires à l'amélioration de l'intention dans les chaînes de valeur porcines. Les résultats révèlent que les croyances des individus concernant les résultats de la mise à niveau et les ressources auxquelles ils accèdent ont une influence positive significative ; tandis que les membres du ménage ont une influence négative significative sur l'intention de mise à niveau de l'individu. En pratique, ce résultat pourrait être utile pour comprendre le comportement des agriculteurs et des autres acteurs des chaînes de valeur agricoles. Théoriquement, cette étude fait progresser la méthodologie et l'application du modèle TCP pour le développement de la chaîne de valeur agricole, en fournissant un ensemble d'éléments de questionnaire qui pourraient être utilisés pour de futures études comportementales dans divers contextes sociaux.

Mots clés: Genre, chaîne de valeur porcine, théorie du comportement planifié, Ouganda, mise à niveau

## **INTRODUCTION**

Upgrading is critical in creating competitive agricultural value chains and, in turn, provides primary source of income for agricultural households. Upgrading requires that chain actors do something different that adds value, such as: moving into products with increased unit value, improving the production processes to gain more efficiency, adding new functions that increase value, or selling through new market channels (IDRC, 2011). Women play a key role in agriculture and can be instrumental in upgrading (FAO, 2018). However, gendered patterns in factors influencing division of labour and access to and control of resources make it difficult for women to participate and benefit from upgrading, consequently affecting their incentives to upgrade (Sebstad and Manfre, 2011; Quisumbing *et al.*, 2014; Oduol *et al.*, 2017). Nonetheless, gender analysis of factors influencing participation of men and women, and the subsequent upgrading efforts, is often limited to qualitative analysis for identifying; who does what, who has access and control of resources and benefits, and influencing factors. Application of the qualitative analysis alone, often isolates the analysis of how behavioural and situational factors influence participation of individual men and women within the social context in which the value chains are situated (Burton, 2004;

Madrigal and Torero, 2012).

### ***Application of Theory of Planned Behaviour (TPB).***

The Theory of Planned Behaviour posits that anticipated outcome behaviour is generally determined by proximal behavioural factors being mediated by behavioural intentions (Ajzen, 1991). TPB incorporates three factors to influence behaviour; attitude, social norms, and perceived behavioural control (see Fig. 1). Theory of Planned Behaviour (TPB) suggests that a specific behaviour is guided largely by a reasoned action approach which assumes that people's behavioural actions follow reasonably from their beliefs, attitudes, and intentions (Ajzen, 2006). Attitude is the degree a person has as favourable or unfavourable evaluation towards the behaviour (Ajzen, 1991). Social norms are a product of an individual's personal beliefs about how 'important others' want them to behave, and their motivation to comply with those expectations. Perceived behavioural control (PBC) factor refers to the individual's perception of personal control over the outcomes of the behaviour, comprising of internal factors (e.g., skills, knowledge) and external factors (e.g., availability of resources, facilitating conditions), and is thought to influence behaviour both indirectly, through the mediating role of intentions, as well as directly (Ajzen, 2015).

Since its introduction (in 1985), TPB has become one of the most frequently used and influential models for analysing factors influencing human social behaviour (Ajzen, 2011)

Analysis of influencing factors helps to examine which factors affect women's or men's activities, resources, or goals and shape gender relations, and determine different opportunities and constraints by year for men and women (March *et al.*, 2005; Patil and Kokate, 2017). The analysis in turn gives an indication of how men and women can overcome or exploit these factors to achieve their goals. Application of TPB and gender situational factor analysis in this study allows identifying influencing factors for upgrading in smallholder pig trading. Identifying present influences can give an indication of future trends in upgrading behaviour of men and women participating in pig trading. Analysis of influencing factors also presents important opportunities and constraints that shape gender participation, and determine different opportunities and constraints for men and women to increase their involvement in value chains (Farnworth, 2015). These factors are broad and interrelated hence, in this study, the application of correlation and regression analysis is considered appropriate.

## METHODOLOGY

### Behavioural Measures

**Upgrading Intention.** Variables suggested by Ajzen (2006) in constructing a TPB questionnaire were used to construct the measure for intention to upgrade in pig value chains. Upgrading,

which is the behaviour of interest in this study was defined in terms of its target, action, context, and time elements. The target and action element being "improving", the context element being "pig trading", and the time element was "within 12 months". The pig production cycle from pig birth to maturity for pork production being generally 9-12 months, during which pig trading takes place in different forms such as sell of weaners, growers, and finishers; the intention for pig trading was measured within a timeframe of 12 months. Therefore, upgrading intention was measured within 12 months using two latent behavioural variables; i) will, and ii) plan. The following items were used to measure upgrading behaviour; 'I will improve pig trading within the next 12 months', and 'I plan to improve the pig trading within the next 12 months'. Responses were measured on a five-point Likert scale, ranging from Strongly Agree (1) to Strongly Disagree (5).

**Attitude towards upgrading.** Eight items were aligned in the questionnaire based on TPB constructs of attitudes, to assess men and women's behavioural beliefs about upgrading in pig trading. Behavioural beliefs represent the extent to which an individual believes will implement the behaviour in question, along with evaluation of the outcomes, which in turn determine the individuals' attitudes toward the behaviour (Fishbein and Ajzen, 2010). Questionnaire items used to assess men and women's attitude towards upgrading in pig trading were; i) "I intend to improve...", ii) "I will take action to improve...", iii) I plan to improve...", iv) Improving will

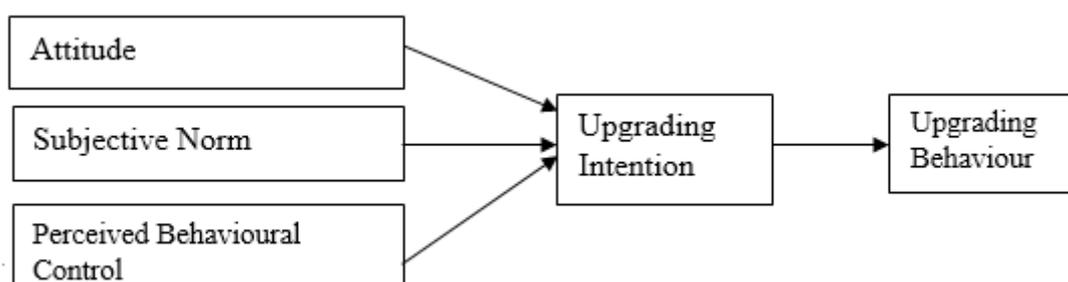


Figure 1. TPB conceptual framework for socio-psychological factors influencing upgrading intention

be good”, v) Improving will be enjoyable”, vi)“Improving will be valuable”, vii)“Improving will be beneficial”, and viii) Improving will be easy”.

**Subjective norm towards upgrading.** As a measure of subjective norm, eight items were constructed based on baseline survey (Ouma *et al.*, 2014), to capture normative beliefs relating to the perceptions of pressure from others. Because of limitations in the scope of baseline data, of which the results provided information on beliefs about influential people and contextual factors (particularly the constraints, opportunities and benefits), for this study we expanded the scope by constructing items on individual’s beliefs based on TPB. The eight items constructed were rated on a scale of 1-5 points (‘Strongly Approve’ =1 to ‘Strongly Disapprove’ =5), to capture other people’s perception in form of approval or disapproval, and the individual’s belief of the pressure from the others to perform the behaviour of upgrading in pig trading. The eight items used, were: i)“My husband would..”, ii)“My wife would..”, iii)“My in-laws would..”, iv) “My parents would..”, v) “My colleagues would..”, vi) “Religious leaders in my community would..” vii)“Political leaders in my community would..”, and viii) “Veterinary Officer in my community would..”.

**Perceived Behavioural Control towards upgrading.** Personal evaluation of how easy or difficult the behaviour is to perform, was used to measure perceived behavioural control. PBC was assessed using items relating to the individual’s belief in their ability to perform the behaviour (Ajzen,1991; Fishbein and Ajzen, 2010). The question on perceived behavioural control (PBC) in assessing the influencing factors asked participants; “To what extent do you think the following capabilities will enable you to improve the pig enterprise in future (next 12 months)?” Respondents answered six items related to this question, on a scale from 1 (“strongly agree”) to 5 (“strongly Disagree). Items included what

capabilities they perceived to have and how confident they were that they could upgrade in pig and pork trading in the next 12 months. The six items used were; i) “local knowledge and skill that I have will enable me to improve...”, ii) “information that I get will enable me to improve...”, iii) “tradable resources that I have will enable me to improve...- resources e.g.: pig, pork, service, labour, equipment, space”, iv) “the strength I have will enable me to improve...”, v)“If I want to improve the pig enterprise, I will do it”, vi) the decision to improve will completely be up to me”.

### **Sample size**

Population sample of 296 people was determined. The sample comprised 150 men and 146 women. The required sample size was determined using three (3) variables of behaviour recommended by Ajzen (1991), which was used to estimate the minimum acceptable sample size. The three behavioural variables considered were; i) Attitude, iii) Subjective Norm, and iii) Perceived Behavioural Control (PBC). The minimum number of sample respondents was calculated using the formula by Green (1991) as elaborated in Field (2009). The formula was used to calculate separately, the minimum acceptable sample size for each location in the district, based on the three (3) determinant variables for behaviour.

$$\text{Min. sample size} = \sum (50 + 8k)$$

where k is the number of determinant variables for behaviour.

k=3, for each of the 4 locations

i.e; 1) Attitude, 2) Subjective Norm, 3) Perceived Behavioural Control

### **Data collection and Analysis**

**Data collection tool.** Data on socio-demographic attributes, beliefs (attitude, subjective norms and perceived controls), additional gender situational factors, and behavioural intention (upgrading intention) were obtained through interview

sessions on Likert items using a Computer Aided Personal Interview (CAPI) questionnaire. The data was calculated for means as a score where scores that had significant relation were further analysed to determine strongest factors that influence behavioural intention towards upgrading in smallholder pig value chain. The data analysis was performed using The Statistical Package for Social Sciences for Windows (SPSS, 2019).

**Reliability Analysis.** Cronbach's alpha test was applied first to evaluate the reliability of the likert- type scale questions with the aim of ensuring each question under a variable are all measuring the same underlying attributes.

**Principle Component Analysis (PCA).** Principle component analysis (PCA) was furthermore, performed to determine which factors had the most influence towards behavioural intention on upgrading in smallholder pig value chain. In terms of extraction method, principal component analysis was preferred when compared to the common factor analysis, due to its strength of data reduction in a group of large number of variables. Since this section was to address the specific question of "what socio-psychological factors influence upgrading behaviour of men and women in commercialization?", PCA was more appropriate. This is because PCA explains variables in terms of smaller number of factors or components which usually account for the variance of large number of variables (Norman and Streiner, 2003).

Twenty-four (24) variables corresponding to: Attitude (8), Subjective Norm (8), and Perceived Behavioural Control (6) were entered into SPSS's Principle Component Analysis. Components were retained through the Kaiser criterion, at eigen values >1, which was confirmed by a 'knee' in the scree plot. An orthogonal rotation (varimax) was used and loadings factors 0.5 were necessary to identify whether a set of variables was contributing in a component and then it was labeled according to TPB antecedents

of behaviour (Ajzen, 2006). Scores of each component were used as outcomes. Multiple linear regression models were fitted to assess the relationship between each component obtained through the principal component analysis and independent variable-the upgrading intention.

Interpretation of the PCA rotated solution by varimax showed that several items loaded on more than one factor. This suggested the possibility of correlations between factors, implying that a structural equation model was needed for further analysis of factors influencing upgrading behaviour of men and women participating in smallholder pig value chain.

**Table 1. Study locations and study sample**

Study Location	Sample Size Calc.	Sum
Kyanamukaka	50+(8*3)	74
Katwe-Butego	50+(8*3)	74
Kabonera	50+(8*3)	74
Kimanya-Kyabakuza	50+(8*3)	74
Total Minimum Sample size required		296

## RESULTS

### Respondents demographic Information.

A total of 296 respondents were successfully interviewed, using a computer aided personal interview (CAPI) questionnaire. Table 2 shows that almost equal number of female (50.2%) and male (48.5%) respondents were interviewed, majority of whom were found to be in the age brackets of 36-53 years (45.6%) and 18-35 years (40.9%). Majority of the respondents were of Christian affiliation (76.8%) with a few Muslims (6.8%), married (75.5%), and living in households as either household head (38%) or wife (32.9%).

### Measures of Reliability for TPB items and upgrading intention

**Chronbach coefficient and Measure of sample adequacy.** Table 3 shows the 18 items that were used in the questionnaire for analyzing socio-psychological factors influencing upgrading

intention. Cronbach's coefficient alpha was used for measurement of reliability for the 18 items used. Cronbach's alpha coefficients of the measured items had average alpha coefficient of 0.631 of all the 4 variable scores (ranging from .565 to .701). Application of TPB requires that the set of items to be used must be shown to correlate highly with each other (i.e., the measure should have high internal consistency). Evidence suggests that in application of TPB to study behavioural factors, measures for attitude, subjective norm, perceived behavioural control,

should have an average alpha coefficient of about 0.65 (Cheung and Chan, 2000). Results obtained show that all the three TPB variables scored an average alpha coefficient of 0.631, implying that all the 58 items used were reliable for measuring factors influencing upgrading behaviour of men and women traders in smallholder pig value chain. Results in Table 3 show the following reliability coefficients for each TPB variable; Attitude (0.701), Subjective Norm (0.565), Perceived Behavioural Control (0.585), and Upgrading Intention (0.673).

**Table 2. Summary of respondent's demographic characteristics (n=296)**

Demographic Attribute	Frequency (n)	Percentage (%)
<b>Gender</b>		
Male	146	48.5
Female	150	50.2
<b>Age</b>		
Below 18 years	1	0.4
18-35 years	97	40.9
36-53 years	108	45.6
54-70 years	27	11.4
above 70 years	1	0.4
<b>Highest Education</b>		
No formal Education	29	12.2
Primary Education	88	37.1
O-level Secondary	50	21.1
A-level Secondary	10	4.2
Vocational Training	43	18.1
Graduate Degree	14	5.9
<b>Marital Status</b>		
Married	179	75.5
Widow/Widower	18	7.6
Unmarried	22	9.3
Divorced/Separated	15	6.3
<b>Household Relationship</b>		
Household Head	90	38.0
Husband	12	5.1
Wife	78	32.9
Daughter	4	1.7
Son	5	2.1
Grand Child	1	0.4
Mother	1	0.4
<b>Religious Affiliation</b>		
Christian	182	76.8
Muslim	16	6.8
No Religious Affiliation	13	11.4
Other (specify)	12	5.0

**Table 3. Reliability measures of Dependent Variable (DV) and Independent Variables (IV) (n=296)**

Constructs	Variable	No. items	Coeff. value	Kaiser-Meyer-Olkin (KMO)	Bartlett's Test of Sphericity	df	sg
TPB	Independent Variables				Approximate chi-square		
	Attitude	7	.701	.800	482.250	21	.000
	Perceived Behavioural Control	6	.681	.668	133.564	10	.000
	Subjective Norm	8	.565	.681	1083.125	28	.000
Upgrading Intention*	Dependent Variable						
	Composite Var.	10	.673	.725	368.849	36	.000

IV Average coefficient 0.655 (n=4)

Upgrading Intention\* = { CapResources + OppoMarketplaces + OppoBuyers + OppoExtension + MotivGoal + MotivConditions + BenefStandard + BenefEmployPeople + AttBeneficial + BenefSaveMoney }

Measures of Sample adequacy and sphericity was performed using a factor analysis was employed by loading items of TPB variables (Attitude, Subjective Norm, Perceived Behavioural Control) and Upgrading Intention. A reliability analysis was then conducted to test for adequacy of selected items of TPB and Upgrading Intention. Test of sample adequacy was done through Kaiser-Meyer-Olkin (KMO) method and Bartlett's test of sphericity. Bartlett's test of sphericity had the p-value (sig.) of 0.000 < 0.01 for all TPB and Upgrading Intention items (Table 5). Results indicated that the items and sample population (n=296) of men and women participating in pig and pork trading was adequate. KMO statistics for all items of TPB variables were greater than 0.60 (lowest=0.631, highest=0.960) (see Table 5). This implies that the data on TPB variables support the factorability of the correlation matrix and is suitable for analysis of socio-psychological factors influencing upgrading intention in smallholder pig value chains.

### Principal Component Analysis (PCA)

#### Descriptive statistics for TPB components.

Descriptive statistics in Table 6 present the means, standard deviations, and communalities of the rating of psychological factors influencing upgrading by men and women traders for each of the TPB measured.

Trade referents (0.789), household referents

(0.780) and outcome beliefs (0.705) scored highly as psychological factors influencing upgrading behaviour of men and women traders in smallholder pig value chain. These factors had the highest mean of 32.59, respectively. Standard deviation (SD) values for all 7 variables of TPB factors were above 1.00, which shows that men and women participating in trading pigs and pork differed in their opinions about factors influencing their upgrading behaviour.

Communalities of the TPB items analyzed show how much variance of the items accounted for the extracted components. The TPB items with high values were well represented in the common factor space analysis of the upgrading behaviour, while items with low values (<0.4) were not well represented (Fred and Paul, 2005; Kriishnan and Ramasamy, 2011). Since communalities values for all 7 TPB items, were not below 0.4 (lowest=0.400, highest=0.789), no item was dropped from the factor analysis model for upgrading behaviour in smallholder pig value chain.

#### Scree plot and variation explained.

Eigen values >1 were considered for the number of components to be generated. The eigen values associated with each component represented the variance explained by that particular linear component (Field, 2009). The scree plot shown in Fig.2 depicted that after sixth component, the line become almost horizontal and initial

eigen value reduced to less than ‘1’ after the sixth components (Also see Table 7). All factors extractable from the analysis along with their eigen values, and the percent of variance was attributable to each TPB factor. The initial eigen values of the first six components of principal component analysis were >1, that is 4.646, 2.883, 1.976, 1.663, 1.293 and 1.14, respectively.

The variances explained by these components were 21.12%, 13.11%, 8.98%, 7.56%, 5.89%, and 5.22% respectively. All the remaining components were non-significant. The first six components accounted for total variance of 61.86% for all 7 TPB components analysed. This was regarded as satisfactory in social sciences (Hair *et al.*, 2014).

**Table 4. TPB adequacy measures for upgrading in smallholder pig value chain (n=296)**

TPB variable	Component	Item /Statements	coefficient	
Attitude	Outcome belief	Improving will be good	.819	
		Improving will be enjoyable	.719	
		Improving will be valuable	.705	
	Behavioural belief	I will take action to improve	.737	
		I plan to improve	.671	
		Improve will be easy	.662	
Perceived Behavioural Control (PBC)	Perceived power	I intend to improve	.657	
		Decision completely up to me	.731	
		Information I have enable	.722	
	Facilitating conditions	If I want I will do it	.631	
		Local knowledge will enable	.884	
		The strength I have will enable	.628	
Subjective Norm (normative referents)	Trade referents	Religious leaders will approve/ disapprove	.960	
		Colleagues will approve /disapprove	.959	
		Political leaders will approve / disapprove	.840	
	Household referents	My husband will approve/ disapprove	.803	
		My wife will approve/disapprove	.786	
		My In-laws will approve/ disapprove	.650	
Upgrading Intention (UI)	Referent Others	Veterinary officers will approve /disapprove	.791	
		Parents will approve/disapprove	.775	
	Controlled motivation (UI1)	Good working conditions will motivate men	.973	
		Meeting my goals in life will motivate me	.973	
	(UI2)	Rewards-driven	I will benefit by improving standard of living	.708
			I will benefit by saving/putting money aside for future	.652
Tradable resources will enable me			.575	
(UI3)	Opportunity –seeking	I will benefit by providing employment people	.408	
		Extension services will enable	.602	
		Improving will be beneficial	-.580	
		Buyers /brokers will enable me	.419	

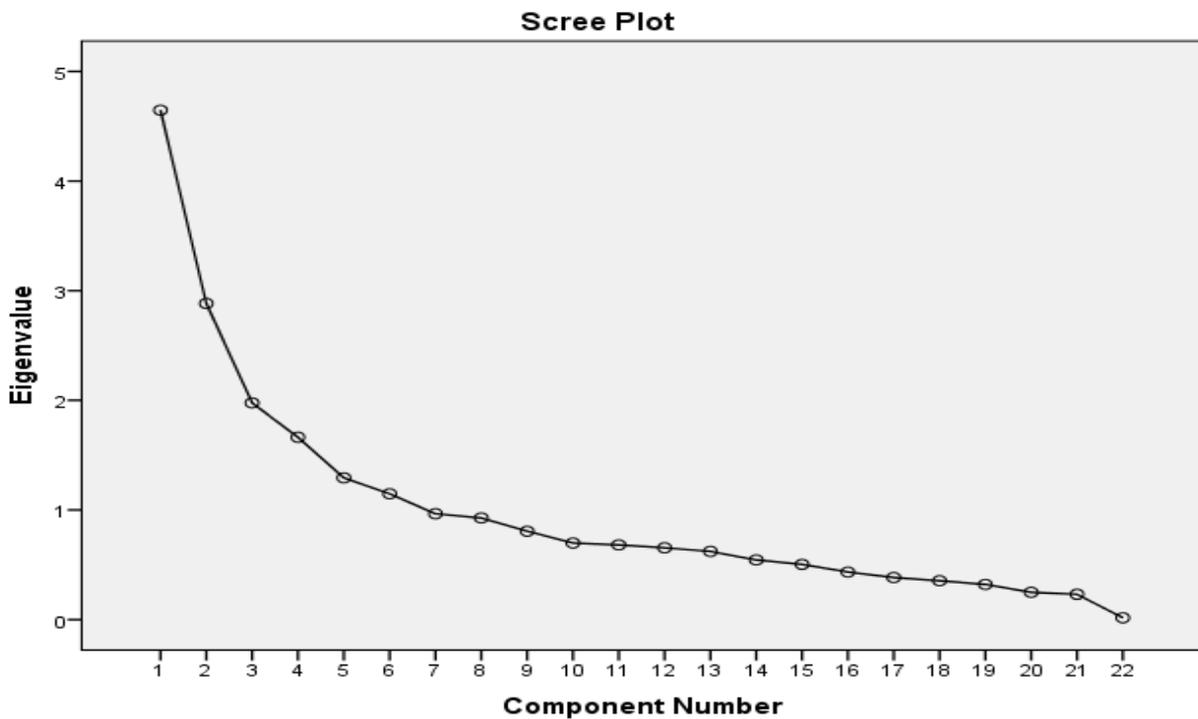
Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotated Component Matrix. Rotation converged in 5 iterations.

**Table 5. Descriptive statistics of raw scores on PCA items of TPB (n = 296)**

Sr. No.	PCA Variables	Mean	SD	Communalities	
				Initial	Extraction
TPB components					
1	Outcome belief	13.86	1.48	1.000	.705
2	Behavioural belief	17.16	2.43	1.000	.659
3	Perceived power	12.35	2.35	1.000	.565
4	Facilitating conditions	8.39	1.62	1.000	.488
5	Trade referents	13.76	19.76	1.000	.789
6	Household referents	32.59	52.83	1.000	.780
7	Referent others	9.03	1.18	1.000	.400

Extraction Method: Principal Component Analysis

Source: Field Study, 2017



**Figure. 2. Scree plot showing contributions of TPB components with respect to eigen value (=1)**

**Table 6. Percentage of total variance by TPB components for initial eigen values>1**

Component	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	%Var.	Cum. %	Total	% Var.	Cum.%	Total	%Var.	Cum.%
1	4.646	21.120	21.120	4.646	21.120	21.120	3.005	13.661	13.661
2	2.883	13.105	34.225	2.883	13.105	34.225	2.766	12.574	26.235
3	1.976	8.983	43.208	1.976	8.983	43.208	2.441	11.097	37.332
4	1.663	7.559	50.767	1.663	7.559	50.767	2.256	10.252	47.585
5	1.293	5.878	56.646	1.293	5.878	56.646	1.776	8.072	55.657
6	1.148	5.216	61.862	1.148	5.216	61.862	1.365	6.205	61.862
-	-	-	-	-	-	-	-	-	-
22	.016	.074	100.000						

**Extraction Method: Principal Component Analysis.**

**Extracted factor loadings by varimax rotation.**

In order to obtain a meaningful representation of items and factor mapping along the principal axis, the resulted principal component was rotated using orthogonal transformation by varimax. The results showed that the factor loadings ranged from 0.691 to 0.981 for subscales of three components. Component 1 was loaded with 4 subscales of values from 0.691 to 0.742, while component 2 was loaded with 2 subscales of values from 0.697 to 0.828, and component 3 was loaded with 1 subscale with value of 0.918. The items with loadings 0.4 were considered meaningful and extracted for factor analysis (Field, 2009). Table 7 depicts the factor loadings after VARIMAX rotation which is presented under each of the 3 components, with values above 0.4. Results show how item analysis reduced the original 7 TPB to 3 independent components, all above 0.4. The behaviour of individual items in relation to others within all the same 7 subscales provides good evidence that content of all the TPB items were valid for use in analysis of factors influencing upgrading behaviour of men and women traders in smallholder pig value chain.

**Table 7. Varimax rotated component matrix for items of TPB scale**

Component	1	2	3
Behavioural Belief	.742		
Facilitating Conditions	.696		
Outcome Belief	.692		
Perceived Power	.691		
Household Referents		.828	
Trader Referents		.697	
Referent Others			.918

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a. Rotation converged in 4 iterations

**Regression analysis of socio-psychological factors.** Results (Table 8) show that throughout the three hierarchical regression models, all factors of attitude (i.e., outcome beliefs and behavioural belief) and perceived behavioural control (i.e., perceived power and facilitating conditions) have positive significant influence on upgrading intention; while all subjective norm factors (trade referents and referent others) have non-significant effect except household referents who have negative significant influence on upgrading intention. Attitude factor had significant positive regression with intention to

upgrade, throughout the three models. Outcome Beliefs ( $\beta_3 = .131$ ;  $p < 0.01$ ) and behavioural belief ( $\beta_3 = .159$ ;  $p < 0.001$ ). Multicollinearity tests on outcome beliefs ( $T = .759$ ;  $VIF = 1.317$ ) and behavioural beliefs ( $T = .707$ ;  $VIF = 1.415$ ) show that attitude factors in the model achieved compliance as moderately correlated ( $1 < VIF < 5$ ). This implies that individuals who believe that upgrading is good, enjoyable, valuable, easy, have the plan and are willing to upgrade will most likely implement actions for improving the pig enterprise. Similarly, PBC factors had significant positive regression with intention to upgrade, throughout the two models; perceived power ( $\beta_3 = .159$ ;  $p < 0.001$ ) and facilitating conditions ( $\beta_3 = .352$ ;  $p < 0.001$ ). Multicollinearity tests on perceived power ( $T = .731$ ;  $VIF = 1.369$ ) and facilitating conditions ( $T = .824$ ;  $VIF = 1.213$ ) show that PBC factors in the model achieved compliance obtained as absence of collinearity ( $T > 0.10$ ) and moderately correlated ( $1 <$  that upgrading is good,  $VIF < 5$ ), implying that items used for PBC are accepted for further analysis. These results indicate that individuals who decide on their own whether to upgrade or not

(complete control) and have the capabilities in form of information, local knowledge and strength will most likely implement actions for upgrading. Subjective norm factors, to the contrary showed mixed regression results. Trade referents had non-significant positive regression, as well, referent others had non-significant but negative regression with upgrading intention. Household referents, on the other hand, had significant negative regression with upgrading intention. Tests of collinearity on trade referents ( $T = .919$ ;  $VIF = 1.089$ ), household referents ( $T = .881$ ;  $VIF = 1.138$ ), and referent others ( $T = .951$ ;  $VIF = 1.052$ ) show that subjective norm factors in the model achieved multicollinearity compliance ( $T > 0.10$ ;  $1 < VIF < 5$ ), hence the items used for subjective norm are accepted for further analysis in this study. Results suggest that opinion of household members is important for the individual to take actions of improving the pig enterprise. Whereas, the opinion of colleagues in pig trading (trade referents) does not influence the individual's decision to upgrade or not; although it would have a negative effect.

**Table 8. Hierarchical regression of TPB factors influencing upgrading intention (n = 296)**

Dependent Variable	Model $\beta_1$	Model $\beta_2$	Model $\beta_3$	Tolerance	VIF
<b>Upgrading Intention</b>					
Attitude (ATT)					
Outcome belief	.249***	.125**	.131**	.759	1.317
Behavioural belief	.294***	.124**	.159***	.707	1.415
Perceived Behavioural Control (PBC)					
Perceived power		.310***	.259***	.731	1.369
Facilitating conditions		.349***	.352***	.824	1.213
<b>Subjective Norm (SN)</b>					
Trade referents			.005	.919	1.089
Household referents			-.167***	.881	1.136
Referent others			-.063	.951	1.052
R-Square	.209	.436	.464		
Adj. R-Square	.202	.426	.447		
F-Value	30.453***	44.222***	27.948***		
R-Square Change	.209	.227	.028		
F-Value Change	30.453***	46.100***	3.962***		

\*=  $p < 0.05$ ; \*\*=  $p < 0.01$ ; \*\*\*=  $p < 0.001$

## **DISCUSSION AND CONCLUSION**

The study aimed to determine socio-psychological factors that would influence the upgrading intention of men and women participating in the pig value chains. Consistent with previous studies, attitudes, norms and capabilities influence participation of men and women as well the upgrading behaviour, particularly of women in agricultural value chains (Bolwig *et al.*, 2011, Sebstad and Manfre, 2011; Quisumbing *et al.*, 2015). Furthermore, evidence suggests that as value chains upgrade, women become more marginalized in terms of access to resources and control of benefits, due to influence of norms, attitude, and limited capability (Farnworth, 2015; Quisumbing *et al.*, 2015). However, most of the previous studies are based on observations and qualitative analysis of transcripts from field narratives of women involved in agricultural value chains (Quisumbing *et al.*, 2015). Thus, the contribution of this study to previous studies is the application of a theory-The Theory of Planned behaviour, to determine socio-psychological factors influencing the upgrading intention by using quantitative methods for data collection and analysis. In socio-psychological studies, intention is a proximal antecedent of outcome behaviour (Ajzen, 2006; Bai *et al.*, 2014; Leeuw *et al.*, 2015; ).

Results of this study reveal that attitude is a significant factor that positively influences the upgrading intention of men and women involved in pig value chains. The attitude components of behavioural beliefs and outcome beliefs towards upgrading both positively influenced the upgrading intention. This finding is in agreement with the general proposition by Ajzen (1991; 2015) that attitude is a significant factor determining behavioural intention and consequently the outcome behaviour. With specific reference to gender in value chains, this finding also agrees with the field observations by Sebstad and Manfre (2011), which found attitude was an important factor influencing upgrading behaviour, with reference to women, in agricultural value chains. Thus, findings of

this study confirm the important role of attitude in predicting the upgrading intention, and the subsequent outcome behaviour, of men and women in agricultural value-chains.

Behavioural beliefs are concerned with perceived presence of conditions and power that may facilitate or impede behavioural intention and subsequent performance of a behaviour (Ajzen, 2006). Results of this study revealed that power perceived to be held by men and women, and the facilitating conditions present in the rural and urban areas of the pig value chains influence their upgrading intention. These results were consistent with findings of previous studies based on narratives of women in agricultural value chains. In the coffee value chains in Uganda, women expressed that they did not benefit as much from participation at different nodes of the coffee value chains because they believed men were asserting power over them (women) in access and control of coffee and the revenue from sale of coffee. Contrarily the analysis of field narratives on distributional outcomes regarding Nerica upland rice value chains in Uganda, interestingly revealed that despite the perpetuation of gender divisional arrangements pertaining to land, crops, labour, and other resources, there seemed to be a shift in some households with women's bargaining positions being strengthened and spouses sharing NERICA proceeds in new, more democratic ways by arriving at decisions through improved dialogue (Lodin, 2012).

According to Njuki *et al.* (2013) the collective approach to household behaviour takes account of the fact that households consist of different members who go through an intra-household bargaining process in the allocation of resources and decision-making. Recent studies reveal that intra-household relationships pertaining value chain marketing and access to markets, husbands tend to dominate decision making of what to sell, when to sell, and how to allocate income from sale of agricultural produce (Riisgaard *et al.*, 2010; Masamhaa *et al.*, 2018) . Similarly, results

of this study on the pig value chains in Uganda reveal that intra-household members were a main referent group perceived to influence upgrading intention and consequently the upgrading behaviour among the households. Influential referents in form of husbands, parents and in-laws were found to be influential intra-household members, who had significant negative influence on the upgrading intention in households. However, improvements could be made through inclusive value chain development by encouraging collaborative participation of household members into pig value chains so that they can appreciate and share benefits derived from the pig enterprise.

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#### STATEMENT OF NO CONFLICT OF INTEREST

The authors declare that there is no conflict of interest in this paper.

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