



# Basic Psychological Needs and Outcomes of an SDT-Based Training Program: Comparison of Rural Farmers in Palestine and Malawi

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# The aims of this talk

- This presentation will present preliminary findings from a pilot study conducted in Palestine and Malawi.
  - Participants were members of farmer groups trained under the **SHEP Approach**, an SDT-based scheme.
- The aim of the study is to identify factors that contribute to **the effectiveness of training programs that aim to improve the livelihoods of impoverished farmers in developing countries**.
  - Focus on basic psychological needs: aspects of the training and environment that satisfied or frustrated BPNs.



Malawi, September 2022

# The SHEP Approach



- The **Smallholder Horticulture Empowerment & Promotion (SHEP)** approach has been successful in improving impoverished farmers' income levels in developing countries.
  - SHEP is implemented as a technical cooperation project between a country's government and Japan International Cooperation Agency (JICA).
  - First launched in Kenya in 2006: as of May 2023, has been expanded to **57 countries** in Africa, Asia, the Middle East, and Latin America.
    - Official records indicate that the initial Kenyan 5-year project doubled farmers' nominal agricultural income, and subsequent projects in Kenya and other African countries reported similar outcomes ([Sayanagi, 2017](#))
    - One RCT study conducted in Kenya demonstrated that SHEP increased farmers' agricultural income by 70% ([Shimizutani et al., 2021](#))

# SHEP & SDT

- SHEP incorporates SDT principles to enhance participants' autonomous motivation towards training, and many features are unusual in international development ([Sayanagi & Van Egmond, 2023](#))
  - No cash or material incentives or “inputs”
  - Farmers chose whether to participate or not *vis á vis* being selected by a government/aid agency, and what crops to grow based upon market survey
  - Gender sensitivity training... etc., etc.
- Government officials and frontline extension officers responsible for implementing SHEP receive intensive training so that SDT principles are understood and implemented appropriately.
  - The textbook is available online in [Japanese](#), [English](#), [French](#), [Spanish](#), and [Arabic](#)



Extension officer training @ JICA Tsukuba, April 2023

# Background of the present study



- This study is part of the JICA Ogata Research Institute (JICA-RI) research project *An empirical research on the impact of the SHEP approach on small-scale farmers*
- The study focuses on SHEP projects in Palestine (EVAP) and Malawi (MA-SHEP)
  - The two projects were selected as they both have completed 5-year phases of SHEP training and have contrasting characteristics.
  - The study will examine how BPNs are supported in the projects and the effect of BPN support on project outcomes.
  - The results presented today are from the pilot study (the study is ongoing)
- There are still very few rigorous research reports on SHEP
  - Research has yet to back up the assumption that BPN support is driving SHEP's success
  - Research may identify factors that would further SHEP's effectiveness.

# Challenges

- There are no adequate scales that measure BPN satisfaction/frustration of impoverished farmers in developing countries.
  - “Normal” Likert scales often do not validly measure constructs in poverty contexts ([Sayanagi et al., 2021](#))
- No existing scales that the validity of a new scale could be examined with.
- Literacy rates are low, especially in Malawi.
- No established method to qualitatively assess BPN satisfaction/frustration.

All measures need to be hand-crafted from scratch: questionnaires need to be conducted orally in some cases

## Development of a Motivation Scale in Rural Madagascar<sup>1)</sup>: The Challenges of Psychometrics in Impoverished Populations of Developing Countries

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This series of studies initially aimed to develop a scale to measure the motivation, based on the self-determination theory, of rural farmers in Madagascar toward an agricultural training program. Considering the low rate of literacy, the Likert scales were designed to be administered orally. However, there were several unforeseen challenges in psychological measurement that hindered the development of the scales. Despite several revisions, responses to the questions lacked sufficient variance for the first four studies. The scale produced in the fifth study attained marginally satisfactory variance and internal consistency. The final version of the scale asked questions in the second person and measured the respondents' frequency of thoughts, instead of their degree of agreement with a first-person statement as is common in many scales. The possible reasons behind the lack of variance when answering in degrees are discussed. The challenges involved in the quantitative psychological measurement of impoverished populations, as well as considerations for future research in poverty contexts are also discussed.

**Keywords:** psychometrics, development aid, poverty, reflective ability, self-determination theory

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# Aims of the present study

- Development of a quantitative scale for BPN satisfaction/frustration for farmers in developing countries.
- Development of a qualitative method to assess BPN satisfaction/frustration for farmers in developing countries.
- Examination of validity of both measures.
  - Cross-examination of quantitative and qualitative measures
  - Correlation/correspondence with external criteria
- Identification of factors that satisfy/frustrate BPNs of farmers in developing countries.
  - Covariance among SHEP farmers in BPNs and environmental factors

# Method: Participants

- Participants were selected from several sites in each region
  - Sites commutable from the capitols were selected.
  - Participants were selected by local program managers at each site.
  - It was explicitly communicated that there would be no stipend for participating in the survey: refreshments were served in Palestine in respect to local custom and because temperatures were extremely high.
- 33 Palestinian farmers from 6 sites and 16 Malawian farmers from 8 sites participated in the survey (mean age 48.8)
  - 6 Palestinian farmers responded only to the questionnaire (27 responded to the interview, 33 to the questionnaire)
  - 3 Malawian farmers' questionnaire data were lost due to a communication error (16 interviewees, 13 questionnaire responses)
    - The number of Malawian farmers was smaller because sites were scattered and commuting took more time: additionally, nationwide fuel shortages forced the cancellation of a survey at 1 site.



# Method: Survey details

- The survey was conducted in August-September of 2022.
- A 24-item BPNSF scale was developed based on Sayanagi et al. (2019) (see Appendix 1)
  - Translated to Arabic and Chichewa and verified via back-translation
  - Items were stated as questions in second person and asked the frequency that the respondent had such thoughts as suggested by [Sayanagi et al. \(2021\)](#), e.g., “How often do you feel confident in your farming?”
  - Due to limited literacy, some farmers needed assistance to fill in the sheets.
- Semi-structured interview (see Appendix 2 for questions)
  - Interviews were conducted through interpreters
- Information from field notes was used to supplement the analyses



Farmers filling in questionnaires in Palestine: the standing woman and sitting male are extension officers assisting illiterate participants

# Results & discussion: The quantitative scales

- Distribution of many items were skewed (*cf* [Sayanagi et al., 2021](#)) (Appendix 1)
- Reliability (Appendix 1)
  - Only the Relatedness Satisfaction subscale attained acceptable internal consistency ( $\alpha = .73$ ).
  - Reliability for Competence Satisfaction was marginally tolerable after deleting one item ( $\alpha = .65$ ).
  - None of the other subscales reached satisfactory reliability even after deleting items ( $\alpha$ s = .48-.59).
  - Reliability was computed for scales combining satisfaction and frustration: only relatedness reached tolerable level, others did not even after deleting items.
- Correlation between subscales (Appendix 3)
  - Satisfaction and frustration scales of same needs were not negatively correlated.
  - Satisfaction subscales were positively correlated with each other, as were frustration subscales.
- Validity of the subscales is questionable, but scores were computed nonetheless using item combinations with highest alphas.

# Results: Qualitative assessment of BPNs

- Interview recordings were transcribed, and quotes were coded when judged that the farmer's need was satisfied or frustrated.
- Qualitative codes were dummy-coded (no quotes=0, one or more quote=1), but none of the corresponding needs' quantitative scores and quantitative codes were significantly correlated.
  - There was almost no variance in Malawian dummy scores, so only Palestinian scores were used to compute correlations

## Coding examples

Need	Sample quote
Autonomy satisfaction	Agriculture is a national obligation, and I must continue working to feed people and make food available
Autonomy frustration	I have no choice but to continue farming [even if it is not profitable] because if the fields are uncultivated, they will be confiscated by the Israelis.
Relatedness satisfaction	My family has good discussions when deciding what crops to grow.
Relatedness frustration	I don't contact the extension worker because they're not very helpful.
Competence satisfaction	My life has improved greatly after MA-SHEP training.
Competence frustration	The income generated from my fields is not enough to survive.

# Results & discussion:

## Quantitative comparison of Palestine and Malawi

### Comparison of scale scores (Appendix 4)

- AS was significantly higher and AF was significantly lower in Palestine.
    - A somewhat curious result: many Palestinian farmers did not own land and did not have full authority to decide what to grow; many landowning Palestinian farmers claimed not to be profitable but said they needed to continue using the fields so that they would not be confiscated.
  - No significant  $p$  difference but CS higher by moderate effect size in Palestine.
    - Could be understood that Palestine is more developed and has more agricultural resources than Malawi.
    - However, SHEP training impact on livelihood is apparently bigger in Malawi, so Malawi was expected to have higher CS score.
- Again, the validity of the quantitative scales are suspect
  - It also may be that inter-country comparison of scores are not meaningful

# Other qualitative findings

- Impact of SHEP training
  - All Malawian farmers stated that their lives had improved significantly through the adaptation of SHEP. Farmers gave concrete examples, and some invited the interviewers into their improved homes.
  - As the question was added during the pilot study, not all Palestinian farmers were asked, but some stated that EVAP did not have much impact.
- Trust in extension workers
  - All Malawian farmers, but only half of the Palestinian farmers, said they ask the SHEP extension officer when they encountered problems.
  - Some Palestinian farmers stated that extension workers were not helpful.
- Adoption of SHEP techniques
  - All 17 of the Malawian farmers conducted market surveys, a key component of SHEP training, to decide what crops to grow, but only 4/27 of the Palestinian farmers did so.
  - In general, Malawian farmers mentioned SHEP techniques more frequently: some Palestinian farmers mentioned none.

# Conclusions

- Quantitative scales for BPNSF are not satisfactory.
  - Most scales' internal consistency are not acceptable.
  - Scores are hard to interpret, calling into question their validity.
- Current interview questions seem to extract BPNSF to some extent.
  - There is inconsistency as some respondents needed extra questioning and still some respondents' answers were not codable.
- SHEP training seems to have been more effective in Malawi.
  - Trained techniques were being used more frequently, and farmers' livelihoods were quite apparently more improved.
- Training effectiveness may be related to the degree of trust in extension workers.

# Limitations and future directions

- The Malawian sample for this study consisted of the most successful farmers of the MA-SHEP training.
  - Average years of education was over 9 years and not significantly different from Palestine, a highly educated country.
  - Additional interviews with Malawian farmers were conducted in March 2023 and included MA-SHEP farmers that were still struggling.
  - Education levels seem to be associated with effectiveness of training.
- The impact of the extension officers should be examined.
  - Interviews with some Palestinian extension workers had been conducted online in early August 2022, but not all farmer groups interviewed for this study were covered. We will interview the remaining extension workers as well as additional farmers in future surveys.
  - Malawian extension officers in charge of the groups surveyed in this study were interviewed in March 2023, but were not included in this presentation as there were only two of the most successful farmers from each group.
- Quantitative scales need to be revised, but how?
  - Ideas and suggestions are welcome!

# Appendix 1: Scale items and descriptives

Item	<i>M</i>	<i>SD</i>
<b>Autonomy satisfaction</b> (alpha = .32 for all 4 items; .54 for items 7+13)		
1. Some farmers are free to choose whatever they do in their farming. How often do you feel this way?	3.26	0.95
7. Some farmers are able to make decisions and farm any way that they want to. How often do you feel this way?	3.13	0.93
13. Sometimes, farmers feel they are able to choose how to do farming as they really like. How often do you feel that you are able to make the choices you really want in farming?	3.37	0.74
19. Some farmers are able to farm in ways that interest them. In your farming, how often are you able to do things that really interest you?	3.21	0.94
<b>Autonomy frustration</b> (alpha = .49 for all 4 items; .56 for items 8+14+20)		
2. Sometimes, farmers might feel as if they are doing their farming just as a duty. How often do you feel this way?	1.80	1.08
8. Sometimes, farmers can feel as if they are under pressure to do their farming tasks. How often do you feel this way?	2.94	1.12
14. Sometimes, farmers have no choice but to do things in farming that they really don't want to do. How often do you feel in your farming that you are doing something that you don't want to do?	3.13	0.78
20. How often do you feel that you are doing farming just because you have to?	2.35	1.22

All items were 4-point Likert scales

Scores for frustration items are reversed.

Alpha for all 8 items: .08



# Appendix 1: Scale items and descriptives (contd.)

Item	<i>M</i>	<i>SD</i>
<b>Relatedness satisfaction</b> (alpha = .73 for all 4 items)		
3. People often want to be cared for by the people important to them. How often do you feel that such people care for you?	2.85	1.01
9. People often want to feel connected to people that are important to them. How often do you feel connected with the people who you care for?	3.11	1.04
15. People often want to feel close and connected to the people that are important to them. How often do you feel close and connected with other people who are important to you?	3.13	1.02
21. People often want to feel warm and safe with the people that they are with. How often do you feel warm with the people you spend time with?	3.61	0.68
<b>Relatedness frustration</b> (alpha = .59 for all 4 items)		
4. How often do you feel like you are being excluded from a group you want to belong to?	3.41	0.93
10. How often do you feel that the people who are important to you are cold and distant towards you?	3.24	0.71
16. Sometimes, people feel that the people around don't like them. How often do you feel that you are spending time with people who dislike you?	3.04	0.82
22. Sometimes, people feel that the relationships that they have are shallow or empty. How often do you feel that the relationships you have with the people around you are shallow or empty?	2.94	0.74

All items were 4-point Likert scales

Scores for frustration items are reversed.

Alpha for all 8 items: .68

# Appendix 1: Scale items and descriptives (contd.)

Item	<i>M</i>	<i>SD</i>
<b>Competence satisfaction</b> (alpha = .35 for all 4 items; .48 for items 11+23)		
5. How often do you feel confident in your farming?	3.41	0.83
11. How often do you feel capable at farming?	3.30	0.89
17. Sometimes, farmers set goals in farming and work hard to achieve those goals. How often do you feel able to achieve your goals in farming?	3.37	0.74
23. Some farmers are confident that they are able to do even difficult tasks in their farming. How often do you feel you can be successful in doing difficult tasks in farming?	2.94	0.93
<b>Competence frustration</b> (alpha = .58 for all 4 items; .65 for items 6+12+18)		
6. Sometimes, farmers might have doubts that they can do farming well. How often do you feel this way?	2.89	0.90
12. How often do you feel disappointed at your results in farming?	3.00	0.67
18. Sometimes, farmers are unconfident about their farming abilities. How often do you feel unconfident about your farming abilities?	2.87	1.09
24. How often do you feel like your farming is a failure because of the mistakes you make?	3.41	0.54

All items were 4-point Likert scales

Scores for frustration items are reversed.

Alpha for all 8 items: .41

# Appendix 2: Semi-structured interview questions (selected)

- What kind of farming do you do?
- How big are your fields? Do you own the land?
- Who works on your farm besides you?
- Has your life improved through EVAP/MA-SHEP? If so, in what way?
- How is your relationship with the people who work on your farm?
- Who makes the decision on what and when to grow in your farm?
- What do you consider when deciding what to grow?
- Please describe the times, if any, you feel positive towards farming.
- Do you think your farming skills are good? When do you feel this way?
- If any, please describe when you feel negative towards farming.
- Do you ever feel that your farming skills are not good? Please describe.
- Do you ever think that you don't want to farm any more, but feel that you have no choice but to continue? Please describe.

# Appendix 3: Inter-scale correlations

	AS	AF	RS	RF	CS
Autonomy satisfaction	—				
Autonomy frustration	-.12	—			
Relatedness satisfaction	.35*	.20	—		
Relatedness frustration	.14	.54***	.20	—	
Competence satisfaction	.38**	-.10	.35*	-.13	—
Competence frustration	.30*	.32*	.24	.61***	.15

\*\*\*:  $p < .001$ ; \*\*:  $p < .01$ ; \*:  $p < .05$

# Appendix 4: Country differences in BPNs

	Palestine <i>M</i> ( <i>SD</i> )	Malawi <i>M</i> ( <i>SD</i> )	Welch <i>t</i>	<i>d</i>
Autonomy satisfaction	3.41 (0.57)	2.85 (0.85)	$t(16.35) = 2.20^*$	0.84
Autonomy frustration	2.50 (0.61)	3.59 (0.55)	$t(24.56) = -5.90^{***}$	-1.81
Relatedness satisfaction	3.17 (0.66)	3.17 (0.86)	$t(17.85) = 0.00$	0.00
Relatedness frustration	3.10 (0.57)	3.31 (0.45)	$t(27.80) = -1.32$	-0.38
Competence satisfaction	3.24 (0.65)	2.81 (0.88)	$t(17.44) = 1.62$	0.59
Competence frustration	2.90 (0.74)	2.97 (0.57)	$t(28.51) = -0.37$	-0.11

\*\*\*:  $p < .001$ ; \*:  $p < .05$