

Measuring Cognitive Empathy of Agricultural Students: An Exploration of a Cognitive Empathy Construct

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Introduction

Cognitive empathy is considered one of the most valuable skills agricultural communications students need to develop (Chenault, 2008; Corder & Irlbeck, 2018). Skills associated with cognitive empathy include the ability to take others' perspectives and understand others' emotional states (Michaels et al., 2014). Because of its value in developing students' empathy, scholars should investigate students' development of cognitive empathy and increase the frequency in which they seek to measure such skills. Our study aimed to provide further construct validity evidence of the cognitive empathy scale originally developed by Reniers et al. (2011). When using a scale to collect data from a population different than the one from which the scale was created, it is critical to determine if the scale is appropriate for the different population and measures the intended construct accurately. Reniers et al.'s (2011) cognitive empathy subscale has been broadly used in other fields, such as psychology, neuroscience, and law, but no studies investigate its construct validity with an agricultural student population.

Framework

Reniers et al.'s (2011) cognitive empathy scale served as the framework in our study because "a strong conceptual foundation needs to support the assumption that a structure does exist before the exploratory factor analysis is performed" (Hair et al., 2018, p. 137). To develop the cognitive empathy scale, Reniers et al. gathered cognitive empathy-related items from four commonly used and validated empathy scales. Using a sample of students and employees from the University of Manchester and Manchester Metropolitan University, Reniers et al. conducted two studies to examine construct validity of the scale (i.e., principle components analysis, confirmatory factor analysis). The cognitive empathy scale has two subscales of its own: 1) perspective-taking, which "involves intuitively putting oneself in another person's shoes to see things from his or her perspective" (10 items); and 2) online simulation, which involves "an effortful attempt to put oneself in another person's position by imagining what the person is feeling" (9 items; Reniers et al., 2011, p. 90).

Methods

These methods may be similar elsewhere because the current study was part of a larger project. We distributed the scale to students enrolled in two undergraduate agricultural communications and journalism courses at Texas A&M University during the Fall 2021 and Spring 2022 semesters and collected 106 responses. Most respondents were seniors ($f = 32$, 60.38%) who identified as 22 or 23-year-old ($f = 29$, 54.72%) females ($f = 42$, 79.25%). We used the Kaiser-Meyer-Olkin test to assess sampling adequacy (Kaiser, 1960) and Bartlett's Test of Sphericity to examine interrelationships between factors (Bartlett, 1950). We also conducted an exploratory factor analysis and used a principal components analysis approach to extract factors (cut-off value = .30; Field, 2017). We then used the oblique rotation method since the two cognitive empathy subscales correlated (Preacher & McCallum, 2003). In our analysis, we used the a priori criterion and loaded items onto the two hypothesized constructs (i.e., subscales) because we were testing the existing dimensionality of the scale (Hair et al., 2018). Last, we used Cronbach's alpha (α) to examine the scale's reliability.

Results

The Kaiser-Meyer-Olkin measure was .85 and Bartlett's Test of Sphericity was significant ($\chi^2(171) = 755.92$, $p < .001$), indicating our data met the criteria necessary to conduct an

exploratory factor analysis. Factor one ($\alpha = .87$) consisted of 10 items with factor loadings ranging from .42 to .87 and explained 32.98% of the total variance (see Table 1). Factor two ($\alpha = .80$) consisted of 8 items with factor loadings ranging from .48 to .74 and explained 11.61% of the total variance. The factors loadings were consistent with the original scale.

Table 1

Factors and Items of Students' Cognitive Empathy after Factor Rotation

Cognitive Empathy Items	Factor	
	1	2
I can tell if someone is making their true emotion.	.87	
I am good at predicting how someone will feel.	.80	
I can easily tell if someone else wants to enter a conversation.	.79	
I can sense if I am intruding, even if the other person does not tell me.	.69	
I can pick up quickly if someone says one thing but means another.	.69	
I can easily tell of someone else is interested or bored with what I am saying.	.68	
I am quick to spot if someone in a group is feeling awkward or uncomfortable.	.65	
Other people tell me I am good at understanding how they are feeling and what they are thinking.	.54	
I am good at predicting what someone will do.	.50	
I can easily work out what another person might want to talk about.	.42	.33
Before I do something I try to consider how my friends will react to it.		
Before criticizing somebody, I try to imagine how I would feel if I was in their place.		.74
I try to look at everybody's side of a disagreement before I make a decision.		.74
I always try to consider the other fellow's feeling before I do something.		.69
When I am upset at someone, I usually try to "put myself in his shoes" for a while.		.66
I sometimes try to understand my friends better by imagining how things look from their perspective.		.61
I can usually appreciate the other person's viewpoint even if I do not agree with it.		.57
I find it easy to put myself in somebody else's shoes.		.53
I sometimes find it difficult to see things from the "other guy's" perspective.		.48

Conclusions and Recommendations

The item *Before I do something I try to consider how my friends will react to it* did not load onto either factor. Therefore, when implementing the cognitive empathy scale with agricultural students, we recommend removing this item. In addition, the item *I can easily work out what another person might want to talk about* loaded onto both factors. We recommend scholars revise the item to *I can easily tell if someone does or does not want to discuss a certain topic with me* and determine if cross-loading is eliminated on the revised item. The revised item is more specific to an authentic social interaction and may lend more directly to perspective-taking. Our suggested modifications may allow scholars to measure agricultural communications students' cognitive empathy more accurately. As a result, educational interventions could be developed to target the development of such skills and identify necessary curricular changes.

References

- Baker, A. C., Jenson, P. J., & Kolb, D. A. (2005). Conversation as experiential learning. *Management Learning*, 36, 411–427. <https://doi.org/10.1177/1350507605058130>
- Bartlett, M. S. (1950). Tests of significance in factor analysis. *British Journal of Psychology*, 3(2), 77–85. <https://doi.org/10.1111/j.2044-8317.1950.tb00285.x>
- Chenault, E. A. (2008). *Factors influencing agricultural journalists and agricultural communicators* [Doctoral dissertation, Texas A&M University]. Texas A&M University Electronic Theses, Dissertations, and Records of Study.
- Corder, J., & Irlbeck, E. (2018). Agricultural communications skills, abilities and knowledge desired by employers compared to current curriculum: A literary review. *Journal of Agricultural Education*, 59(4), 177–193. <https://doi.org/10.5032/jae.2018.04177>
- Field, A. (2017). *Discovering statistics using IBM SPSS Statistics* (5th ed.). Sage Publications.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2018). Exploratory factor analysis. In *Multivariate data analysis* (pp. 121–189). Cengage.
- Kaiser, H. F. (1960). The application of electronic computers to factor analysis. *Educational and Psychological Measurement*, 20(1), 141–151. <https://doi.org/10.1177/001316446002000116>
- Michaels, T. M., Horan, W. P., Ginger, E. J., Martinovich, Z., Pinkham, A. E., & Smith, M. J. (2014). Cognitive empathy contributes to poor social functioning in schizophrenia: Evidence from a new self-report measure of cognitive and affective empathy. *Psychiatry Research*, 220(3), 803–810. <https://doi.org/10.1016/j.psychres.2014.08.054>
- Preacher, K. J., & MacCallum, R. C. (2003). Repairing Tom Swift's electric factor analysis machine. *Understanding Statistics*, 2(1), 13–43. https://doi.org/10.1207/S15328031US0201_02
- Reniers, R. L. E. P., Corcoran, R., Drake, R., Shryane, N. M., & Völlm, B. A. (2011). The QCAE: A questionnaire of cognitive and affective empathy. *Journal of Personality Assessment*, 93(1), 84–95. <https://doi.org/10.1080/00223891.2010.528484>
- Tabachnick B. G., & Fidell, L. S. (2011). *Using multivariate statistics* (6th ed.). Pearson.