Behavioral Dispositions of Beginning Farmers and Livestock Producers in the Southwestern U.S.: Context Variables with Potential to Inform Education and Communication Programming

Kyle C. Gilliam
Graduate Student
Texas Tech University
Box 42131
Lubbock, TX 79409
(806)834-8786
kyle.gilliam@ttu.edu

Laura M. Gorham
Graduate Student
Texas Tech University
laura.gorham@ttu.edu

Matt Baker
Professor
Texas Tech University
matt.baker@ttu.edu

Scott Burris
Professor
Texas Tech University
scott.burris@ttu.edu

Glenn Cummins
Associate Professor
Texas Tech University
glenn.cummins@ttu.edu

Erica Irlbeck
Associate Professor
Texas Tech University
erica.irlbeck@ttu.edu

Behavioral Dispositions of Beginning Farmers and Livestock Producers in the Southwestern U.S.: Context Variables with Potential to Inform Education and Communication Programming

Introduction and Need for Study

Beginning farmers prefer a variety of instructional methods used by educational providers and look positively toward Extension as an educational provider (Trede & Whitaker 1998). Three behavioral dispositions which may provide important insight as to how beginning farmers and livestock producers (BFLPs) receive and process information include locus of control (LOC), tolerance for risk (RISK), and self-efficacy (SE). LOC characterizes how individuals perceive what happens around them (Rotter, 1966). Individuals are categorized into an external locus (belief that circumstances and related outcomes are not within an individual's control) or an internal locus (belief that one's ability, behaviors, and efforts determines circumstances and outcomes). RISK is associated with the tolerance levels of an individual's willingness to risk resources, and is presumed to be a major issue in formulating financial decisions (Grable & Lytton, 1999). SE determines an individual's perception of their own ability to perform over an assortment of diverse situations (Judge et al., 1998). Higher SE individuals perceive themselves as being able to perform most or any task given to them well, where lower SE individuals are less confident in their own ability to perform tasks they are presented.

Type of BFLP operation is likely related at some level to LOC, RISK, and SE. Much of the arable farm land in the southwestern U.S. is in semi-arid and arid climatic zones with annual production highly dependent upon irrigation. Beef produced in this region are started in cow/calf herds on large-acreage ranches, transitioned as stockers to winter wheat, and then onto feedlots in irrigated areas for finishing. Large-scale dairy operations are generally located close to sources of feed from irrigated areas. In a study of farmer's sustainability of water conservation practices, Kistler, Jones, Baker, and Doerfert, (2005) identified three categories of farmers including 1) environmentally conscious but open to changing their practices, 2) environmentally conscious but more risk averse, and 3) indifferent to environmental consequences and self-identified culturally by the crops grown.

Collectively, the behavioral dispositions, type of farming, and livestock production operation may be important context variables (Dunkin & Biddle, 1974) in the decision making process that BFLPs go through. These variables inform the teaching and learning dynamic which can be used by Extension, industry, or private educators (e.g. Crop or Livestock consultants). Thus, the objectives guiding this exploratory study were: (1) describe BFLPs on LOC, RISK, SE, and demographics; (2) determine bivariate correlations between these variables; and (3) identify the LOC, RISK, & SE dimension that explains the greatest differences in distinguishing type of farming/livestock production operation.

Methods

Data were collected on demographics and the three farm-level decision making factors from October 2015 - March 2016. An online instrument was distributed to a convenience sample of volunteers who self-identified as prospective BFLPs in the region. This descriptive correlational study was part of a larger study conducted by the authors. The LOC consists of 29 behavioral situations with external choices worth one point each and internal choices worth zero. Higher scores represent an external locus ($\alpha = 0.65 – 0.79$). RISK consists of eight, four point Likert-scaled items and five, three point Likert-scaled items. RISK scores are then summed where

individuals are categorized into one of the following groups, low (<19), below average (19-22), moderate (23-28), above average (29-32), and high (33>). The established reliability coefficient of this instrument is r = 0.75 (Grable & Lytton, 1999). SE consists of eight items measured on a five point Likert-type scale. Scores for this measure are summed and subjects are categorized into five groups, low (8-23), below average (24-27), average, (27-31), above average (32-34), and high (35-40). Cronbach's α for internal consistency range from 0.85 - 0.90 for the general self-efficacy scale (Chen, Gully & Eden, 2001).

Data were analyzed using descriptive statistics, bivariate correlations, and discriminant function analysis (DFA) in SPSS (v.22). Due to the small number of subjects (n = 20) and convenience sampling strategy employed, inferential statistics were not reported and readers are encouraged to limit these findings to the sample only. Additionally, the sample size did not satisfy the suggested sample size requirements for discriminant analysis, thus findings must be interpreted with caution.

Results

All the BFLPs were male (n = 20), 85% were pursuing an undergraduate degree, and 65% were involved predominately in crop production. The subjects could be described as predisposed to an internal LOC (M = 7.55, SD = 2.80), a moderate tolerance for financial RISK (M = 25.5, SD = 4.49), and a high SE (M = 34.90, SD = 2.77). A small relationship (Hopkins, 2006) was discovered between LOC and SE (r = .10), a trivial relationship (r = .06) between LOC and financial RISK, and a small relationship between SE and financial RISK (r = .16). In terms of type of operation, a low association existed with LOC (r = .26), a low association with SE (r = .26), and a moderate association with financial RISK (r = .39). In terms of the DFA results, collectively the weighted combination of the three discriminating variables (LOC, RISK, and SE) explained 31% of the variance in predicting BFLPs who identified as farmers and those who identified as livestock producers (Eigenvalue = .440, Canonical Correlation = .553, Wilks Lambda = .694). The standardized discriminant function coefficients for the discriminant function revealed that the three behavioral measures all demonstrated a high degree of utility in discriminating between the two groups. All structure matrix scores for the three measures were greater than .3, leading the researchers to conclude some level of practical significance. Both the standardized coefficients and structure score matrix identified RISK as the most influential measure of the three and was negatively related to the discriminant function, and LOC and SE as slightly less influential, but positively related to the function. The model correctly classified almost 70% of those identifying as farmers and 57% of those identifying as livestock producers.

Conclusions, Implications and Recommendations

There was an internal LOC exhibited by these subjects, suggesting they believe in their own ability to manage their operations and their own actions and choices will impact their success with their respective enterprises. There was a moderate tolerance for financial risk indicating that these BFLPs may be somewhat willing to change their production practices, from those of their parents or role models. There was a very high sense of self-efficacy suggesting participants are confident in their own ability to perform well across different conditions and situations. These BFLPs perceive themselves as being able to respond positively to crisis situations. Our team is following these findings by ongoing psychophysiological research in which we hope to identify underlying emotional and physical responses to specific communication cues. Neurocognitive research on cues to problems and messages may offer future solutions to practical Extension and industry programming serving the next generation of BFLPs.

References

Chen, G., Gully, S. M., & Eden, D. (2001). Validation of a new general self-efficacy scale. *Organizational Research Methods,* 2001(4),62. doi: 10.1177/109442810141004

Duncan, M., & Biddle, B. (1974). *The study of teaching*. New York, NY: Holt, Rinehart, Wilson

Grable, J., & Lytton, R. H. (1999). Financial risk tolerance revisited: The development of a risk assessment instrument. *Financial Services Review*, 8 (3), 163-181. doi: 10.1016/S1057-0810(99)00041-4

Hopkins, W. G. (1997). New view of statistics: Effect magnitudes. Retrieved on April 27, 2016 from http://www.sportsci.org/resource/stats/effectmag.html

Judge, T. A., Erez, A., & Bono, J. A. (1998). The power of being positive: The relation between positive self-concept and job performance. *Human Performance*, *11 (2-3)*, 167-187. doi: 10.1080/08959285.1998.9668030

Kistler, M. J., Jones, K. J., Baker, M. T., & Doerfert, D. L. (2005). Attitudinal Variability Among Southern High Plains Cotton Producers Toward Integrated Crop/Livestock Systems. *Association of International Agriculture Extension Educators Annual Conference.*

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs: General and Applied*, 80 (1), 1-28. doi: 10.1037/h0092976

Trede, L. D. and Whitaker, S. (1998). Beginning farmer education in Iowa: Implications to Extension. *Journal of Extension*, 36(5), doi: 5FEA3