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Using Egocentric Networks to Illustrate Information Seeking and Sharing by Alfalfa Farmers in Wyoming

Abstract

We explored using farmers' egocentric (personal) networks to understand how they seek farming advice and how their advice networks map onto their friendship networks. We examined results from a survey of alfalfa farmers ($n = 634$) in Wyoming. Farmers reported seeking advice from neighbors and fellow farmers, and most indicated that these people are also their friends. In this article, we outline the procedure for collecting egocentric network data and report some of our results from using this tool. We conclude by illustrating the utility of acquiring egocentric network information for Extension professionals across domains, contending that such information can facilitate Extension program and technology implementation and information sharing with the public.

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Introduction

Extension professionals must continually assess stakeholder needs and priorities to best serve stakeholders and the public. Social network analysis has assisted Extension specialists in understanding the structure of outreach offices (Bartholomay, Chazon, Marczak, & Walker, 2011) and collaborative management groups (Springer & de Steiguer, 2011). However, the focus of those endeavors was on sociometric networks, the study of which involves exhaustively gathering information on all participants in a network, a process that may not be feasible due to limited funds, time, or other considerations. We offer another method of collecting network data that does not require identifying or enlisting the participation of everyone in a network: egocentric network data collection. Egocentric (or personal) networks are useful for examining a variety of factors, including where people get their information, who they consider their friends, and who they spend time with. Unlike sociometric (or whole) network analysis, where the focus is on the pattern of relationships within a clearly defined group, egocentric network analysis focuses on the networks of individuals: Each person has his or her own network of relationships that cut across many groups and that contribute to the person's behaviors and attitudes (Chua & Wellman, 2011). Accordingly, egocentric network data can be collected fairly easily (e.g., without drawing boundaries around a group as is necessary for gathering sociometric network data) and can yield important insights about respondents' personal networks.

Identifying the public's priorities and needs is important for Extension professionals' work. However, understanding who people turn to for advice and what kind of relationships they value is also important for effectively disseminating information and planning interventions. We used egocentric network data to describe the advice and friendship networks of alfalfa farmers in Wyoming. We outline the procedure for collecting such

data, report some of our results from using this tool, and provide examples of how this approach may be used across other domains and with other respondents.

Literature Review

Farmers around the globe cite knowledge gained from their own experiences ("what worked in the past") and those of other farmers as more important to their decision making than knowledge gained from new scientific research or Extension (Eckert & Bell, 2005, 2006; Jabbour et al., 2013; Macé, Morlon, Munier-Jolain, & Quéré, 2007; Turner, Davies, Moore, Grundy, & Mead, 2007). This circumstance highlights the importance of better understanding farmer experience and farmer networks. Although studies have shown that farmers cite other farmers as important sources of knowledge, we know little about the flow of information through such communities. Egocentric network analysis provides information about how often farmers turn to other farmers for advice about a specific issue or crop (e.g., alfalfa production) and about farming in general. This technique can be implemented at different scales—for example, within communities, towns, or counties—allowing Extension professionals to gather important information and possibly target programs.

Purpose and Objectives

The main purpose of the work reported here was to document growers' advice and friendship networks with regard to production of a specific crop, alfalfa, and farming more generally.

Specific objectives were as follows:

- Examine who growers turn to for advice and specifically whether they turn to Extension professionals.
- Understand whether and how friendship networks overlap with advice networks.
- Introduce a novel type of data, egocentric network data that may assist Extension professionals in understanding stakeholders' advice-seeking, friendship, and other behaviors.

Research Methodology

The data we examined are part of a larger project that involves efforts to understand insect pest challenges facing alfalfa farmers in Wyoming. We used a survey with a networks component that was sent via mail to a sample of Wyoming alfalfa farmers on record with the National Agricultural Statistics Service (NASS). The protocol was approved as exempt by the University of Wyoming Institutional Review Board. The survey was mailed to 3,141 farmers (of the sample of 3,246, the U.S. Postal Service was unable to locate 105 of them). Farmers were sent one postcard reminder 2 weeks after the initial survey was mailed for the purpose of maximizing the response rate. The total response rate was 22.83%; however, only 634 of the returned surveys (20.18%) were completed. The additional 83 surveys (2.65%) were returned uncompleted due to farmers' not farming alfalfa or not farming at all or refusing to respond and/or asking to be removed from the survey list. Raw data from returned surveys were entered by NASS staff, and de-identified data were provided to us. These data form the basis of our descriptive and correlation analyses.

Figure 1 replicates the portion of the survey that requested information on farmers' egocentric networks. Collecting egocentric network data involves asking respondents ("egos") about who they communicate with relative to some dimension—this dimension could be friendship, advice, collaboration at work, or so on. The

people egos name are called "alters," and questions can be asked about the nature and strength of ego-alter relationships. In our case, we asked how often the egos sought advice or were sought for their advice. The resulting information reflects the egos' perceptions of these interactions but provides useful information about the ways in which respondents view and characterize their interactions with others in their communities.

We made several methodological decisions that are reflected in the instrument. First, with a focus group of Wyoming farmers, we pretested an instrument that allowed growers to identify more than five alters but found that growers did not list more than five names. Also, we were interested in respondents' closest advice networks. For these reasons, we limited respondents to identifying only up to five alters. Second, we chose to ask farmers to identify each alter by first name (although NASS did not provide us with these data because of confidentiality concerns). We requested that farmers provide first names because first names create concrete anchors as respondents consider their networks. That is, asking egos to just think of five unnamed people may have created confusion and resulted in less reliable answers.

Figure 1.

Survey Instrument Measuring Growers' Egocentric Advice Networks

Advice Seeking About Farming.			
We are interested in learning more about who producers talk to about their management practices. Please list only their first names in the first column in the table below. Do not list last names or other identifying information.			
Person's first name	How do you know this person? (for example: neighbor, farmer, sales representative, etc.)	Did you seek advice about <u>alfalfa</u> from this person in the last year?	Did this person seek advice about <u>alfalfa</u> from you last year?
1.		<input type="checkbox"/> Often <input type="checkbox"/> Sometimes <input type="checkbox"/> Never	<input type="checkbox"/> Often <input type="checkbox"/> Sometimes <input type="checkbox"/> Never
2.		<input type="checkbox"/> Often <input type="checkbox"/> Sometimes <input type="checkbox"/> Never	<input type="checkbox"/> Often <input type="checkbox"/> Sometimes <input type="checkbox"/> Never
3.		<input type="checkbox"/> Often <input type="checkbox"/> Sometimes <input type="checkbox"/> Never	<input type="checkbox"/> Often <input type="checkbox"/> Sometimes <input type="checkbox"/> Never
4.		<input type="checkbox"/> Often <input type="checkbox"/> Sometimes <input type="checkbox"/> Never	<input type="checkbox"/> Often <input type="checkbox"/> Sometimes <input type="checkbox"/> Never
5.		<input type="checkbox"/> Often <input type="checkbox"/> Sometimes <input type="checkbox"/> Never	<input type="checkbox"/> Often <input type="checkbox"/> Sometimes <input type="checkbox"/> Never

Findings and Discussion

Results presented are from 634 alfalfa farmers from Wyoming who were surveyed by the NASS division of the U.S. Department of Agriculture. The 634 alfalfa farmers named 1,118 alters; however, some information on advice seeking and advice giving was missing for 97 of these alters. Therefore, some aspects of our analysis are based on complete information we had for the entire group of 1,118 alters, and other aspects are based on complete information we had for 1,021 alters.

Our results revealed several interesting trends relevant to Extension professionals. First, respondents were invited to list up to five people whom they turned to for advice about farming: 244 respondents (38.49%) did not list any alters, 105 (16.56%) listed one alter, 77 (12.15%) listed two alters, 68 (10.73%) listed three alters, 45 (7.10%) listed four alters, and 95 (14.98%) listed five alters. On average, the farmers surveyed listed 1.76 alters. This finding indicates that advice networks are limited and that growers turn to a comparatively small number of people for advice on farming, with the most frequently occurring response being no alters. This circumstance indicates an opportunity for Extension to provide information on conditions, pest management, and other issues to alfalfa farmers. Second, our data indicate that advice networks overlap heavily with friendship networks. Of the 1,118 alters listed by the 634 survey respondents, 979 (87.57%) were identified as friends. Advice networks among alfalfa farmers are characterized by friendship. Given that friends are typically accorded higher trust than simple advisors, it is likely easier for friends to disseminate information and have this information be trusted. Although these data do not provide us with information about whether the advice relationship preceded the friendship relationship or vice versa, there is indication that, at least in this instance, members of the alfalfa farming community are connected for reasons other than to seek farming advice. This information may be useful to Extension professionals outside the agricultural domain who are attempting to implement community learning or other initiatives.

We also assessed the composition of growers' egocentric networks. We found that of the 1,118 alters growers listed, 330 (29.52%) were neighbors, the most frequent category mentioned, and 199 (17.80%) were fellow farmers, whereas only 12 (1.07%) were Extension agents and 35 (3.13%) were weed and pest agents. Others were family, children, spouses, clients, and others. Although the alfalfa farmers sought advice from a variety of sources, most of those sources were neighbors and fellow farmers. This situation provides Extension with an opportunity to disseminate information knowing that it will likely spread among neighbors and indicates that there are high levels of information and advice sharing among farmers.

Respondents indicated that they sought advice about farming more often than they were sought for advice. That is, respondents were asked to rate, on a scale where 0 indicated *never*, 1 indicated *sometimes*, and 2 indicated *often*, how often they sought advice from their alters about both alfalfa and farming more generally and how often their alters sought advice from them on these matters. Related to the 1,021 alters for which we had complete data on these variables, the mean for respondents' seeking advice about alfalfa from alters was 1.10 (somewhere between sometimes and often), and the mean for having advice about alfalfa sought from them was 0.65 (somewhere between never and sometimes). In terms of seeking and providing advice about farming in general, the mean for respondents' seeking other farming advice (other than about alfalfa) was 0.92 (somewhere between never and sometimes), and the mean for their having other farming advice sought from them was 0.63 (somewhere between never and sometimes). These data indicate that alters provide an important source of alfalfa farming advice. In addition, farmers are more likely to seek advice from their alters than give it, suggesting a need for more information about alfalfa production. Characterizing egocentric networks provides important insights about not only how information is diffused but also the demand for applied information, which can help Extension professionals plan programming.

Table 1 provides Pearson's *R* correlation coefficients for egocentric advice networks in our sample. Our results indicate that there is a significant correlation ($0.25, p < .05$) between seeking alfalfa advice from alters and being sought for alfalfa advice by alters. Additionally, there is a higher positive correlation of $0.40 (p < .05)$ between seeking other farming advice from alters and being sought for other farming advice by alters. It is important to note that although these relationships are statistically significant at the 95% confidence level, they account for only a portion of the covariance between these variables, suggesting that there are other important contributors to these measures of advice seeking and advice giving.

Table 1.

Correlations Between Seeking Advice and Giving Advice on Alfalfa Farming and Other Farming

	Ego asked for advice from alter about alfalfa farming	Ego was asked for advice from alter about alfalfa farming	Ego asked for advice from alter about other farming	Ego was asked for advice from alter about other farming
Ego asked for advice from alter about alfalfa farming	1			
Ego was asked for advice from alter about alfalfa farming	0.25*	1		
Ego asked for advice from alter about other farming	0.35*		1	
Ego was asked for advice from alter about other farming		0.56*	0.40*	1

Note. Data about 1,021 alters from a survey of 634 respondents (egos). Asterisk indicates that the Pearson correlation is significant at the .05 *alpha* level.

These findings indicate that whereas egos did not seek and provide alfalfa farming advice at the same frequencies, a stronger relationship exists between the frequencies at which they sought and provided advice on other farming topics. Moreover, there is a moderate correlation ($0.35, p < .05$) between the frequencies at which egos sought advice about alfalfa farming and sought advice about other farming, and the highest correlation ($0.56, p < .05$) is between the frequencies of egos' being asked for advice about alfalfa farming and being asked for advice about other farming. This descriptive analysis reveals several interesting trends. According to the reporting by the egos, there is most consistency in the frequencies at which they are asked about alfalfa and asked about general farming and in their advice seeking and advice giving behaviors related to other farming

topics. Regarding alfalfa production, there is a significant but smaller correlation between the frequencies at which egos ask for advice from their alters and are asked for advice by their alters. This finding indicates that advice behavior related to alfalfa production may be qualitatively different from advice behavior related general farming topics. This circumstance may be due to the fact that alfalfa can fit into a Wyoming operation in many different ways—as the only crop grown by ranchers to feed cattle, as one of many crops grown by diverse crop producers, or at large acreages for high-value markets.

Conclusions and Implications

We used egocentric network data generated from a survey to examine the advice and friendship networks of alfalfa farmers in Wyoming. For our respondents, advice networks overlapped heavily with friendship networks. Most of the people named (alters) were neighbors and fellow farmers, indicating that farmers seek advice in ways that relate to geographic boundaries and peer relationship, suggesting the importance of relevance (Szymanski, 2016). Knowledge of advice or other egocentric network attributes can be of service to Extension professionals trying to gather or provide information. For example, the strongest correlation in our data was between being asked for advice about alfalfa and being asked for advice about other farming issues, indicating that egos who are alfalfa farmers may be important sources of farming information more generally, rather than being seen as able to provide only crop-specific advice. Furthermore, our results indicate higher frequencies of seeking advice than providing advice, highlighting a possibly important area for increased Extension involvement. Here, we compared only advice-seeking and advice-providing behaviors related to alfalfa farming and other farming. A more detailed instrument that could be used for making comparisons among crops, for example, could yield important information on where advice seeking is most frequent, allowing Extension efforts to be focused on those areas. In addition, the proportion of alters who are friends may vary depending on the issue of interest (e.g., growth of a specialty or alternative crop new in a region) or depending on the population of interest (e.g., beginning farmers or women in agriculture). Using this tool with different populations may highlight groups of individuals who do not rely on friendships or neighbors so heavily, for example.

Extension professionals across domains beyond agriculture (e.g., health, education) can use egocentric data collection to better understand where their publics seek advice. Networks other than friendship may also be of interest—for example, activity partners, and so on. Extension professionals can pair this information with other information, such as disease rates or information deficits, to reach their publics and stakeholders. Collecting these data is not time consuming: The data collection can be incorporated into more general surveys that are likely already part of efforts to evaluate impacts of Extension programming. In addition, unlike sociometric data collection, egocentric network data collection does not involve the entire population of a given group (that is, the data can be collected from a sample), and it yields important relational information. Such relational information may change over time in a community, and in the face of changes such as budget cuts or program reorganization, could be used as a tool for tracking changes in advice-seeking or advise-providing behaviors.

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