

## Examining the Social Properties of Oklahoma Agricultural Facebook Pages: A Quantitative Content Analysis

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## Examining the Social Properties of Oklahoma Agricultural Facebook Pages: A Quantitative Content Analysis

### Abstract

Social media is used by millions of people in the United States, and producers are often encouraged to maintain a social media presence to promote their businesses and agriculture in general. Farmers have deeply entrenched identities. Social identity theory states people self-sort into certain groups. Social comparison and positive distinction are two principles of social identity theory. There is a need to research how agricultural operations are portraying those identities, including how they portray the identities of dissimilar agricultural operations online. This study compared Oklahoma mainstream and alternative producers in a quantitative content analysis of their Facebook pages. The following objectives guided this study: 1) Describe the agricultural operations in Oklahoma present on Facebook, 2. Describe the Facebook presence of agricultural operations in Oklahoma, 3) Describe operations' expression of social-identity via Facebook, and 4) Compare the communication of alternative and mainstream agricultural operations in Oklahoma. Results of this study indicate that overall agricultural operations do not post frequently. While operations were likely to use positive distinctions to distinguish products from others, they were not likely to use social comparison. Moreover, there were not major differences between mainstream and alternative producers. Qualitative research exploring producers' sense of identity would be valuable. Future studies should also explore the personal pages of agricultural producers, how producers use other social media outlets, and how the results of this study compare to other states' producers.

### Keywords

content analysis, social identity, social comparison, Facebook, social media

### Cover Page Footnote/Acknowledgements

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## **Examining the Social Properties of Oklahoma Agricultural Facebook Pages: A Quantitative Content Analysis**

### **Introduction and Theoretical Framework**

Public perceptions of agriculture vary across sectors of the industry, demographics, and regions. Some members of the public see producers as irresponsible stewards of the environment (Peterson, 2015), even though a producer's identity of being a good farmer often includes being a good steward of the land (McGuire et al., 2013). In general, the public does not perceive farming as prestigious (Pilger, 2015). In response to negative perceptions and portrayals, agriculturists are often encouraged to share stories about positive practices in the industry (Hays, 2019).

One way for agriculturists to share their stories is through social media platforms, such as Facebook, that allow producers to directly engage with consumers (Telg & Barnes, 2012; White et al., 2014). In the first quarter of 2020, Facebook had 2.6 billion monthly active users and 1.7 billion daily active users (Facebook, 2020). It was also reported that 69% of Americans used Facebook in 2019 (Perrin & Anderson, 2019). Social media became a common venue for people to talk about and share ideas regarding food (Arnold, 2019). In 2016, it was estimated 9% of farmers used Facebook for business, highest among all social media platforms included in the study (Wilson, 2016).

While being present and active on social media is important (Bowman et al., 2020; Gibson et al., 2012; Shaw et al., 2015; White et al., 2014), researchers also need to understand what is being shared, especially given that many agriculturalists view social media as an opportunity to promote the industry (Telg & Barnes, 2012; White et al., 2014). This study focused on ingroup and outgroup identity portrayals on agricultural operations' Facebook pages as they have the potential to affect the public's perceptions of agricultural practices. Understanding identity portrayal is important because it has the potential to affect purchases (Lock & Funk, 2016; Reed & Forehand, 2016; Zeugner-Roth et al., 2015) and agricultural practices (Fielding & Hornsey, 2016; Lequin et al., 2019; McGuire et al., 2013). Ingroup favoritism also has the potential to lead to hostility from outgroup members (Dickinson et al., 2018; Li et al., 2011). As such, there is a need to understand ingroup and outgroup portrayals within the agricultural community.

### **Online Behaviors of Agricultural Producers**

Agricultural operations have been encouraged to increase their presence in online media (Shaw et al., 2015; White et al., 2014), and Gibson et al. (2012) recommended use of social media to increase customers and profitability of agribusinesses. Alternative farmers who engaged in online promotional activities increased business viability (Abrams & Sackman, 2014), but only 37.3% of agricultural producers used websites for business purposes and 23.5% use Facebook for business (Shaw et al., 2015).

While it is underutilized, producers recognize the significance and necessity of a social media presence. The primary driver for the use of social media by farmers is financial (Abrams & Sackman, 2014). Some producers choose to engage online to be more visible to potential landlords, attract employees, or to build their farm's brand (Lykins, 2011; Pratt, 2018). Younger producers are more likely to engage in social media for agricultural business use (Telg & Barnes, 2012). Resources exist to help producers engage online by helping them set up successful websites and

social media, as well as offering suggestions for prudent information on About Pages, types of posts for engagement, and timing of posts (Cornelisse, 2016; Culler, 2018; Pratt, 2018).

While there are a variety of resources, the recommendations from these resources can vary. Some suggest posting every other day (Pratt, 2018). Others suggest to simply have a page and disregard engaging in regular posting (Culler, 2018). Past research on agritourism operations in Oklahoma have found that posting frequency by agritourism operations' Facebook pages has a moderate relationship with page likes but a negligible relationship with the number of reactions to those posts (Bowman et al., 2020). Bowman et al. (2020) recommended avoiding one-size-fits-all recommendations to account for different needs of different types of agritourism operations.

## **Farmer Identity**

While online presence is important, researchers also need to understand what is being shared online. This research focuses on identity portrayal due to the influence identity can have on real-world actions, such as land management decisions and general agricultural practices (Groth & Curtis, 2017; Lequin et al., 2019). Studies show producers have deeply entrenched occupational identities, even more so than other occupations. This occupational identity can be parsed out into sub-identities such as farmer, conservationist, or agribusinessman (Abrams et al., 2012; Burton & Wilson, 2006). Farmers' self-concepts are often wrapped up in being as productive as possible, creating higher yields, and supplying cheap and safe food (Burton & Wilson, 2006).

While rural areas are predominately agricultural lands, an assortment of management practices are used (Groth & Curtis, 2017; Mitchell, 2013). These practices range from conventional, large-scale operations to organic production or putting marginal land in conservation programs. While identity affects practices (Groth & Curtis, 2017; Lequin et al., 2019), the practices of agriculture also affect the identity of producers (Bell et al., 2004). Differing practices reflect producers' varying beliefs, values, knowledge, and resources (Mendham et al., 2012), as well as being tied to producers' families (Bell et al., 2004). Producers of all kinds often wrestle with "unresolved tensions between idealized discourses and practices of good farming" (Gray & Gibson, 2013, p. 96). The ideal of a farmer maximizing use of the land often exists through a productivist identity, but producers also see a good farmer as a "steward of the land," which can be a means of using a conservationist identity to temper the productivist identity (McGuire et al., 2013, p. 60). This is an example of the flexible nature of social identity, which can change based on context (Fielding & Hornsey, 2016).

While research has been found comparing agricultural producers to other industries (Gray & Gibson, 2013; Huth et al., 2017), there has not been research found comparing segments of producers within agricultural communication literature. There have also been calls for more research focusing on farmer identity (Fielding & Hornsey, 2016; Lequin et al., 2019). Mainstream and alternative operations were the focus of this study. Mainstream agriculturists were operationalized as conventional, large-scale, traditional operations. Alternative operations were operationalized as locally focused agriculturists, community-supported agriculture, organic operations, and/or agritourism operators (Carolan, 2012). While agricultural practices may vary, USDA said coexistence between different agricultural groups is a priority area (USDA, 2015). Additionally, organizations that could be viewed as competitors, such as mainstream and alternative operations, can benefit from cooperating with each other (Bengtsson & Kock, 2000), which more easily occurs when the competitors trust each other and have a shared identity (Kraus et al., 2019; Mathias et al., 2017; Said, 2019).

There are some basic differences between mainstream and alternative producers. On average, mainstream producers have been farming longer than alternative producers (Egri, 1999). More women are involved in alternative farming than mainstream agriculture (Egri, 1999). Alternative farmers also tend to have strong, direct relationships with their consumers and are more connected to local communities (Goodman, 2000). Alternative agriculture shifted from an idea of a movement to “farmers committed to a deeper, more ideological notion of sustainability” (Goodman, 2000, p. 218). Moreover, alternative producers involved in local food movements have helped reconnect consumers to food and agriculture, offering unique value (Albrecht & Smithers, 2018). Studies have found that reconnections between producers and consumers are valued by both parties. However, these reconnections take added time and effort for both the consumer and producer (Albrecht & Smithers, 2018; Hoey & Sponseller, 2018). Whereas alternative producers attempt to connect with consumers, mainstream producers tout the importance of science and its essentialism in food production (Rotz, 2018). Simultaneously, the same farmers believed consumers question science and prefer science be removed from food production (Rotz, 2018).

Although identities and practices may differ, agricultural producers still need to interact with each other. The actions of neighbors and peers often affect decision making for operations. While producers can benefit from working with their neighbors (Anil et al., 2015), it only takes a small number of individuals to undermine collective social capital (Sharp & Smith, 2003). Organic operations that cannot control what neighbors produce or how they care for their land risk degradation and the purity of products. When a mainstream producer must switch his or her chemical application preferences because of a neighbor’s organic field or grape vineyard, there can be economic consequences. When facing pressures like this, tensions run high and relationships can be damaged. For example, in 2016, a dispute between farmers in Arkansas over dicamba chemical drift ended in murder (Koon, 2017).

Though much attention has been paid to the failing relationships between producers of all kinds and agricultural companies such as Monsanto, few studies have addressed inter-farmer relations (Kinchy, 2012). One study found rising competition between farmers (Rotz, 2018). Another study found that organic producers did not believe they were being served by Extension as well as conventional producers because agents did not understand organic producers’ perspectives (Crawford et al., 2015). Fielding and Hornsey (2016) recommended focusing on superordinate identity when there is the potential for conflict between groups (e.g., focusing on the identity of being a farmer to help mediate conflict between traditional and alternative farmers).

## **Social Identity Theory**

Identity can be thought of through four frames (Jung & Hecht, 2004): personal (i.e., self-image), relational (i.e., identification of oneself with relation to others), enacted (i.e., what one presents to the world), and communal (i.e., how a group defines itself collectively). While identity is often seen as through the personal frame, it is important to recognize the role of social interactions and communities in the development of identity. For the agricultural community, the distinction between mainstream and alternative producers is socially constructed and not easily defined (Goodman, 2000).

Social identity theory states people sort themselves into certain groups (Tajfel, 1978). These groups change the way people perceive the world. The group that one is a part of (i.e., ingroup) is seen as more favorably than the groups one is not part of (i.e., outgroup). This results in an “‘us’ versus ‘them’” mentality (Hogg, 2006, p. 115). Low-status groups will even engage in

self-stereotyping as a coping mechanism when they believe their identity is being threatened (Latrofa et al., 2012).

Social comparison and positive distinctiveness are two principles addressed in Social Identity Theory (Tajfel & Turner, 1979). Social comparison occurs when group members directly compare their ingroup to an outgroup. In Social Identity Theory, groups are referred to as prototypes or a “fuzzy set of attributes (perceptions, attitudes, feelings, and behaviors) that are related to one another...captures similarities with the group and differences between that group and other groups” (Hogg, 2006, p. 118). Positive distinction occurs when the ingroup is clearly favored and its differences are accentuated in communication (Tajfel & Turner, 1979). An example of positive distinction in agriculture is value-added products, meaning “adding value to a raw product by taking it to at least the next stage of production” (Anderson & Hanselka, 2013, para. 3). This type of positive distinction is equally accessible for mainstream or alternative operations. Creating this value was related to increasing the perceived customer benefits (Anderson & Hanselka, 2013).

In agriculture, it is important to understand how mainstream and alternative producers portray their respective ingroups and outgroups on social media because these presentations of identity can affect how members of the public view both communities. Even if the producers never interact with each other in person, these online interactions have real effects, but there has not been much research looking at these ingroup and outgroup perceptions in agriculture. Of particular note, many producers view social media as a chance to combat misinformation about the agricultural industry (Telg & Barnes, 2012; White et al., 2014). If either group of producers believes the outgroup is sharing incorrect or misleading agricultural information, there is the possibility of conflict, which can then undermine any collective efforts between the groups.

### **Purpose and Objectives**

Social identity is an important characteristic in the agricultural community (Bell et al., 2004; Goodman, 2000; Rotz, 2018). There is a need to research how agricultural operations are portraying those identities, including how they portrayed the identities of dissimilar agricultural operations. The purpose of this research was to assess the online communication of Oklahoma agricultural operations, particularly the social properties of this communication. The following objectives guided this study:

1. Describe the agricultural operations in Oklahoma present on Facebook,
2. Describe the Facebook presence of agricultural operations in Oklahoma,
3. Describe operations’ expression of social identity via Facebook, and
4. Compare the communication and social identity portrayals of alternative and mainstream agricultural operations in Oklahoma.

### **Methods**

This study used quantitative content analysis. This research method is an organized and replicable analysis of elements of communication (Riffe et al., 2013). These elements are sorted into categories based on valid rules. The relationships between those categories and elements are then analyzed using statistical methods (Riffe et al., 2013). Typically, content analyses involve selecting a representative sample of the material of interest. Coders are then trained to sort the sample content according to the established rules, also called a codebook.

Past research has shown that Facebook was the most commonly used social media site for producers (Gibson et al., 2012; Wilson, 2014). Therefore, Facebook pages were used as the analysis unit for this study. Pages were identified for analysis via the search function of Facebook. Search terms like Oklahoma agriculture, Oklahoma farm, Oklahoma wheat, and Oklahoma soybean were used. The search terms used were chosen based on the state's agricultural commodities listed in the Agriculture Census (USDA NASS, 2014).

Initially 575 pages were identified. This study was focused only on agricultural operations that were contributing to commercial agriculture, rather than only stock show animals or tourism. Pages were eliminated from the sample if food or fiber were not produced on the operation. For example, if a winery did not produce its own grapes, it was not included in the study. The population for the study consisted of 364 Facebook pages. A panel of experts, consisting of a faculty member in plant science and a faculty member in agricultural economics, sorted pages into two categories: mainstream ( $n = 250$ ) or alternative ( $n = 115$ ). The panel members were chosen due to their Oklahoma agricultural operation expertise. In the context of this study, mainstream agriculturists were operationalized as traditional, conventional, or large-scale operations. Alternative operations were operationalized as locally focused agriculturists, community-supported agriculture, organic operations, unique crops or animals to Oklahoma, and agritourism operators (Carolan, 2012).

A quantitative content analysis of all 364 pages was conducted from February 1 to March 1, 2019. The About Page of the operations' Facebook accounts and all posts for the six-month period between July 1 and December 31, 2018, were examined. This timeframe was used to encompass a change of seasons and to include a time period of harvesting.

A protocol, codebook, and code sheet were made per recommendations from Krippendorff (2013) and Riffe et al. (2013), including recommendations for the identification of content units and classification systems for categories of codes, acceptable levels of interrater reliability, and internal and external validity. The codebook was reviewed by a content analysis expert who was not on the author team to help ensure validity (Krippendorff, 2013; Riffe et al., 2013). Two coders were trained for this study: coder one was a first-year doctoral student in agricultural communications, and coder two was a second-year master's student in agricultural communications. Coders were trained using 30 Facebook pages from a neighboring state (Krippendorff, 2013; Riffe et al., 2013).

The researcher-developed code sheet contained 18 items. Six of the items were factual including business/farm name, mentioning of family, date of last post, number of posts in six-month period, number of agricultural products produced, and types of agricultural products produced. The remaining items required interpretation (Riffe et al., 2013). Items related to the About Page included whether or not positive distinction or social comparison was used and whether or not that social comparison was positive, negative, or neutral (Tajfel, 1978; Tajfel & Turner, 1979). Posts or About Pages were coded as using positive distinction if they included words such as quality, superior, fresh, registered, cage-free, and local. Social comparison was identified if the content alluded or referred to another group or product. For example, "Our beef is better than store bought and will not make you sick," is an example of negative social comparison.

Content related to posts during the study period were coded for whether positive distinction was present and how many times. Social comparison was also examined in posts. The number of times social comparison was used and its category (i.e., positive, negative, or neutral) count was also included.

The agricultural products produced by each page’s operation were recorded during coding. These were then sorted into the following categories: row, oil, and forage crops (e.g., wheat, corn, alfalfa, peanuts); meat-producing livestock (e.g., cattle, meat goats, grass-fed beef, meat rabbits, poultry); fiber-producing livestock (e.g., alpaca, hair sheep, fiber rabbits, llamas); dairy/egg livestock (e.g., dairy cattle, dairy goats, eggs, cage-free eggs, donkey milk); produce (e.g., pumpkins, herbs, microgreens, fruit, vegetables); tree nuts (e.g., walnuts, pecans); fish; and miscellaneous (e.g., honey, lavender, water, cannabis).

Initial interrater reliability was conducted on 10% of the population. Cohen’s kappa was used to measure the level of agreement between coders on an item basis. An acceptable level was reached and the next 10% was coded. Recommended reliability for 20% of the sample is .70 (Riffe et al., 2013). Items that were factual data had a Cohen’s kappa score of 1.0 and the interpretive items had scores ranging from .89 to .74.

Data were analyzed using IBM SPSS 22. Analysis for objectives 1-3 included frequencies, percentages, and descriptive statistics. Analysis for objective 4 was done using an independent samples t-test and chi square analyses.

## Results

### Objective 1: Describe the agricultural operations in Oklahoma present on Facebook

There were 364 Oklahoma agricultural operations found on Facebook. Of those operations, 250 were mainstream operations and 114 were alternative operations. The majority produced only one agricultural product ( $n = 236$ ), 60 produced two agricultural products, 24 produced three, 23 produced four, 12 produced five, four produced six, two produced seven, two produced eight, and one producer produced nine different products.

Table 1 shows the distribution of alternative and mainstream operations among agricultural product types. The average number of operations per product type was 59.8. Fish had the lowest number of operations ( $n = 2$ ). Meat livestock was the highest ( $n = 127$ ). Tree nuts consisted of the highest percentage of mainstream producers (81.0%), while fiber livestock consisted of the highest percentage of alternative producers (96.2%), aside from fish, which only had two total operations.

**Table 1**

*Distribution of Producer Types Among Product Types (N = 364)*

Agricultural Product	Number of Operations	Mainstream	Alternative
Meat Livestock	193	141 (73.1%)	52 (26.9%)
Dairy/Egg Livestock	100	45 (45.0%)	55 (55.0%)
Produce	93	71 (76.3%)	22 (23.7%)
Fiber Livestock	26	2 (7.7%)	25 (96.2%)
Crops	21	17 (81.0%)	4 (19.0%)
Tree Nuts	12	11 (91.7%)	1 (8.3%)
Fish	2	0 (0.0%)	2 (100.0%)
Miscellaneous	31	21 (67.7%)	10 (32.3%)

Oklahoma is split into nine crop reporting districts by USDA. Table 2 shows the distribution of alternative and mainstream operations amongst the districts. The average number of operations in districts was 36.4. District 10 had the lowest number of operations ( $n = 2$ ); District

50 had the highest ( $n = 127$ ). District 30 had the highest percentage of mainstream operations (80.8%), while District 50 had the highest percentage of alternative operations (37.8%), aside from District 10.

**Table 2**  
*Distribution of Producer Types in Crop Reporting Districts*

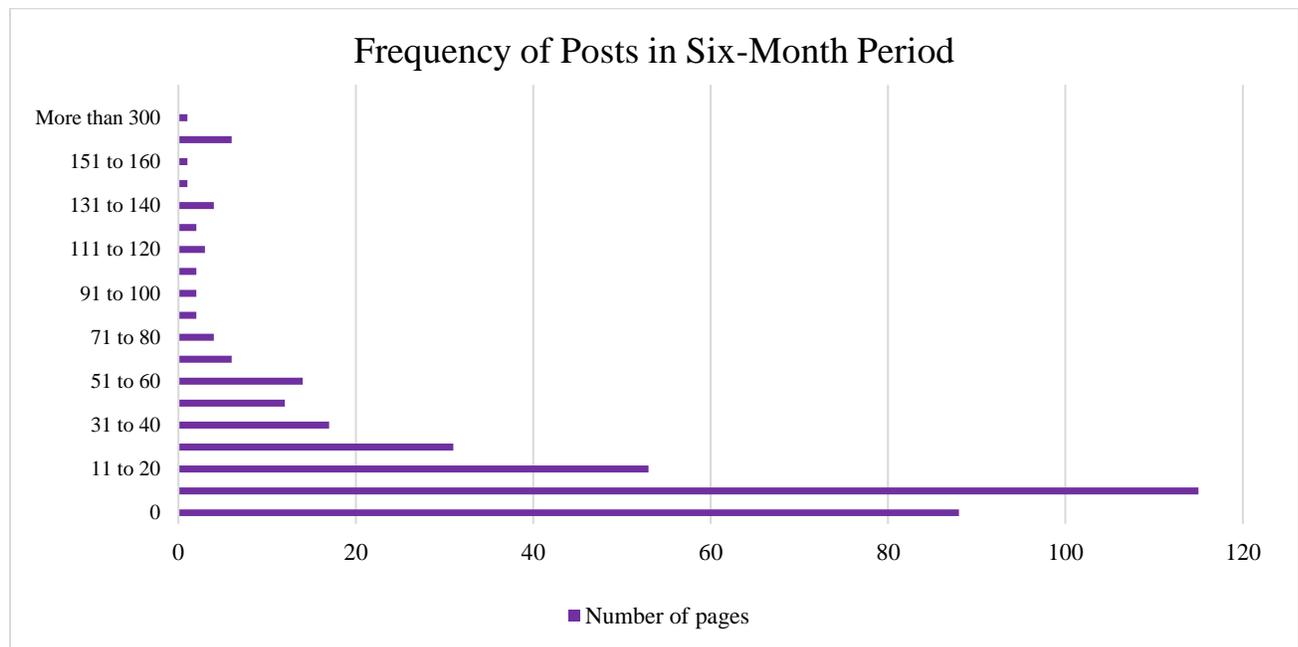
Crop District	Number of Overall Operations	Mainstream	Alternative
10	2	1 (50.0%)	1 (50.0%)
20	11	8 (72.7%)	3 (27.3%)
30	26	21 (80.8%)	5 (19.2%)
40	27	21 (77.8%)	6 (22.2%)
50	127	79 (62.2%)	48 (37.8%)
60	43	31 (72.1%)	12 (27.9%)
70	70	47 (67.1%)	23 (32.9%)
80	40	29 (72.5%)	11 (27.5%)
90	18	13 (72.2%)	5 (27.8%)

**Objective 2: Describe the Facebook presence of agricultural producers in Oklahoma**

The number of total posts during the six-month period were counted. About one-fourth (24.2%) of pages did not post at all during the study period ( $n = 88$ ). The mean number of posts in the six-month period was 23.19 ( $SD = 43.09$ ) with a median number of posts of 8. Figure 1 shows the distribution of frequency posts. More than half of the operations posted less than 10 times in the six-month period ( $n = 203$ ).

**Figure 1**

*Bar Graph Detailing the Number Of Posts in the Six-Month Period.*



### Objective 3: Describe operations' expression of social identity via Facebook

**About Page.** In the About Page, 19.5% ( $n = 71$ ) of pages mentioned being a family-operated business. Positive distinctiveness was used by 56.9% ( $n = 207$ ) of pages. Social comparison (i.e., ingroup vs. outgroup) was only used by 2.2% of pages ( $n = 8$ ). Of those eight pages, seven of them used it negatively and two pages used social comparison in a neutral way. None of the pages used social comparison in a positive way.

**Posts.** In the posts, positive distinctiveness was used by 39.8% ( $n = 145$ ) of pages. Social comparison was only used by 5.2% of pages ( $n = 19$ ). Of those 19 pages that used social comparison, 14 of them used it negatively, six were neutral, and none were positive. Of the pages that used social comparison, 17 pages used social comparison in posts once, one used it twice, and one used it six times.

### Objective 4: Compare the communication and social identity portrayals of alternative and mainstream agricultural operations in Oklahoma

An independent-samples t-test was conducted to compare number of posts in the six-month period in mainstream and alternative operations. There was not a statistically significant difference in the number of posts for mainstream ( $M = 21.90$ ,  $SD = 42.68$ ,  $Mdn = 8.0$ ) and alternative ( $M = 26.20$ ,  $SD = 44.15$ ,  $Mdn = 7.0$ ) operations;  $t(362) = -.882$ ,  $p = .379$ ).

**About Page.** When comparing alternative and mainstream operations, 19.1% ( $n = 22$ ) of alternative operations mentioned being a family-run operation, while 19.6% ( $n = 49$ ) of mainstream operations used the word "family" to describe their businesses. The difference between these variables was not statistically significant, ( $X^2(2, N = 1) = 0.005$ ,  $p = .946$ ). Positive distinctiveness was used by 67.0% ( $n = 77$ ) alternative operations. Fifty-two percent ( $n = 130$ ) of mainstream operations used positive distinctiveness. The difference between these variables was statistically significant, ( $X^2(2, N = 1) = 7.71$ ,  $p = .005$ ) with a small effect size of .145. This was the only statistically significant difference in the study.

Social comparison was used by five alternative operations and three mainstream operations. The difference between these groups was not statistically significant, ( $X^2(2, N = 1) = 3.697$ ,  $p = .054$ ). None of the instances of social comparison were positive. Five of the mentions by alternative operations were negative; comparatively, two of the mentions by mainstream operations were negative. One of the each of the mentions by both types of operations was neutral.

**Posts.** Positive distinctiveness was used by 41.2% ( $n = 47$ ) of alternative operations. Comparatively, 39.2% ( $n = 98$ ) of mainstream operations used positive distinctiveness in their posts. The difference between these groups was not statistically significant, ( $X^2(2, N = 1) = 2.411$ ,  $p = .299$ ).

Social comparison was used by eight (7.0%) alternative operations and 11 (4.4%) mainstream operations. The difference between these groups was not statistically significant, ( $X^2(2, N = 1) = 2.411$ ,  $p = .299$ ). None of the instances of social comparison were positive. Five of the mentions by alternative operations were negative; comparatively, nine of the mentions by mainstream operations were negative. The difference between these groups was not statistically significant, ( $X^2(2, N = 2) = 2.095$ ,  $p = .351$ ). Three of the mentions by both types of operations was neutral.

## Conclusions and Recommendations

According to the 2012 census of agriculture, 80,245 farms are in Oklahoma (USDA, 2014), but our initial Facebook search found just 575, meaning only 0.72% of Oklahoma agricultural operations were accounted for in this study, much less than the projected 9% by Wilson (2016). While some may not have a presence on Facebook, it is also possible that the sampling method did not find every page. Due to this potential limitation, future research should seek to sample producers in a different manner to assess producers' presence on Facebook. If sampling was not the issue, this is concerning because operations are missing out on an opportunity to engage with consumers and potential customers on the largest social network in the world. Organizations that advise producers, such as Extension and USDA, should promote the use of social media by operations because of the opportunity to improve viability of the operations (Abrams & Sackman, 2014), but those organizations should be mindful of past research indicating producers do not always feel comfortable with their social media skills (Telg & Barnes, 2012). Training and support may be necessary to help producers gain a social media presence, but what this support looks like should be guided by needs assessments with the specific communities of producers.

The majority of pages 68.7% ( $n = 250$ ) were mainstream operations and 31.6% ( $n = 115$ ) were alternative operations. This parallels the overall producer population of Oklahoma. (USDA, 2014). Most operations only produced one type of agricultural product. The majority of products produced by operations on Facebook were meat-producing livestock. Cattle and calves are the most productive commodities in Oklahoma (USDA, 2014). Most of the meat producing livestock were mainstream operations. The majority of operations in crops, meat livestock, produce, tree nuts, and miscellaneous were considered mainstream operations. However, the alternative operations were represented proportionately to their overall population distribution in most production categories. The only product categories that alternative operations were overly represented and were also the majority of operations in the category were fiber livestock, fish, and dairy/egg producing livestock.

The distribution of operations through crop reporting districts varied. District 50 had the highest number of operations; this has the largest population center of the state and is more metropolitan. Conversely, district 10 had a very low representation; however, it is also the most sparsely populated region of the state and very rural. Rural landscapes do not seem to have more agricultural operations with a Facebook presence as compared to metropolitan areas. While this makes sense in regard to the overall population of the state, it is also counterintuitive as the more rural parts of the state would be expected to have higher numbers of agricultural operations when compared to the metropolitan areas. Future research that assesses differences in the utility of social media for producers closer to urban centers compared to those in more rural areas would add nuance to understanding the role of social media for supporting the viability of agricultural operations.

A quarter of the pages found did not post in the six-month period. This may suggest that business owners thought it was important at one time to have a page but do not maintain it. Alternatively, it could suggest that just a presence on Facebook for things like contact information was important for some operations, but prioritizing posting is not something they find necessary. This parallels Culler's (2018) suggestion to simply have an online presence, but if page likes are related to overall posting frequency (Bowman et al., 2020), operations are not properly utilizing Facebook to promote their businesses and reach a wider audience (Telg & Barnes, 2012; White et al., 2014).

When operations did post, there was a lot of variance in the frequency of posting. In the six-month period, 55% of operations posted less than 10 times, while two pages posted more than 300 times. There was not a statistically significant difference between frequency of posting between mainstream and alternative operations. The limited number of posts in an extended period of time is worth noting. It can be inferred that both types of operations vary in their use of Facebook, but the tool is being underutilized overall. This is troubling because research has suggested the importance of an active online presence for agricultural operations (Shaw et al., 2015; White et al., 2014), but the results are in line with past research showing not all producers are comfortable with their social media abilities (Telg & Barnes, 2012). In addition to support to help producers begin using Facebook for professional use, the results of this research indicate support is also needed for current Facebook users to more actively use the tools at their disposal.

In terms of the enacted version of their identities, about one-fifth of operations mentioned family, which lines up with past work showing that family is commonly tied to farmers' identities (Bell et al., 2004). A similar number of alternative and mainstream producers mentioned family. The only measure that was significantly different between mainstream and alternative operations was using positive distinctiveness on About pages. Alternative operations used positive distinction more often than mainstream operations on About Pages. While the effect size was small, these results are noteworthy. A higher percentage of alternative operations also used positive distinctiveness in posts that consumers see, but it was not a statistically significant difference. This supports past research that found alternative producers had strong and direct relationships with consumers (Albrecht & Smithers, 2018), which Facebook can help leverage because it can foster direct connection between producers and consumers (Telg & Barnes, 2012; White et al., 2014).

Operations did not often engage in social comparison between their respective ingroups and outgroups, but when they did, social comparison was primarily used in a negative way. Social comparison was found more often in posts than on About Pages. One possible reason is that operations did not want to openly engage in negative discourse on the more permanent About Pages. The lack of social comparison does not necessarily support past research that shows rising competition among farmers (Rotz, 2018). However, this was an initial study of an under-researched area (Fielding & Hornsey, 2016; Kinchy, 2012; Lequin et al., 2019). The pages represented in this study are for the operations themselves, not personal pages of producers. Future research should assess if identity portrayal differs between the producers' professional and personal social media accounts, including portrayal of ingroups and outgroups.

Those engaging with producers, such as Cooperative Extension, should work to foster cooperation between different groups of producers to avoid conceptualizations of an outgroup. If they want to engage in cooperative efforts, producers who are in the same physical area benefit more directly when they work with other local producers as opposed to more geographically distributed producers (Anil et al., 2015). While social comparison was limited in this study, it was generally negative, and a small number of individuals can undermine collective social capital (Sharp & Smith, 2003). As the case in Arkansas showed, it only takes one bad inter-farmer incident to make headlines (Koon, 2017).

Because identity can affect practices and interfere with how producers interact with each other (Field & Hornsey, 2016; Groth & Curtis, 2017; Lequin et al., 2019), future research is needed to better understand how identity manifests with agricultural producers and how they portray themselves to others. This research should be repeated in other states to see if these results are unique to Oklahoma. Another population worth including in future research are those who are

involved in the agricultural industry but are not directly producing food, such as those working for commodity organizations, because they are also likely to engage in online agricultural discourse.

Additionally, a limitation of this research is that only social identity as portrayed on Facebook is assessed. Future research would benefit from including other social media outlets that may lend themselves more readily to other forms of identity expression. Social identity should also be assessed outside of social media environments. In order to thoroughly understand agricultural producers' conceptions of identity, in-depth interviews with producers throughout the state should be conducted. While online communications can be assessed for enacted versions of identity, in-depth interviews can allow for more direct assessment of the personal, relational, and communal identity frames, which is necessary to fully understand producers' identities.

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