Measuring Trust: A Review of Trust Scales Used in Agricultural Communication

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Introduction and Literature Review

Globalization and technological advancements in communication and agricultural practices have increased consumers' interest and awareness about agriculture, especially production practices (Arnot et al., 2016; Wu et al., 2021). For example, consumers are becoming increasingly concerned about new agricultural technologies, such as biotechnology and animal welfare practices (Arnot et al., 2016; Hobbs & Goddard, 2015). These concerns stem from a growing disconnect between consumers and modern farming practices, as well as ethical and environmental apprehensions about biotechnology and corporate influence (Abushal et al., 2021; Arnot et al., 2016). As a result of these concerns, there is an increased lack of trust in the agricultural industry, making some consumers boycott products from companies they do not trust (Muringai & Goddard, 2019). Several agricultural researchers (Gross & Roosen, 2021; Nocella et al., 2010; Sandgren et al., 2019; Spain et al., 2018) have extensively investigated the factors influencing consumer trust to address the prevailing distrust in agriculture among consumers. However, in the existing studies, trust has been examined from different perspectives due to many trust definitions.

In addition, different authors use different words and wording when assessing trust. For example, some authors have used words and phrases like "I think…" and "I feel…" which may imply different aspects of trust to research participants. For example, words like "think" can express cognitive connection, and "feel" can refer to emotional connection (Mayer & Tormala, 2010; Rocklage & Fazio, 2015). These subtle framing differences can profoundly shape how respondents interpret and assign meaning to these questions (Meyer & Mayer, 2010). For example, "I feel…" statements align more with an emotional basis, and "I think…" statements are considered less emotional and appeal to a cognitive basis (Rocklage & Fazio, 2015). However, trust research in agriculture—particularly within the context of communication—has not clearly differentiated between the dimensions of trust being examined, such as trust based on expertise versus trust rooted in emotional connection (Gross & Roosen, 2021; Kjærnes et al., 2022; Nocella et al., 2010; Phillips et al., 2010; Robbins et al., 2016; Sandgren et al., 2019).

The absence of systematic examination of the dimensions of trust being studied in agriculture may contribute to a limited understanding of the sources of increased consumer distrust in agriculture. Therefore, it is important to examine the various instruments and scales used when assessing trust to understand and identify the gaps and opportunities for improvement.

Conceptual Framework

The study of trust has been approached differently by various authors. Some authors looked at different types of trust, such as 'social trust,' 'general trust,' or just 'trust' (Gross & Roosen, 2021; Kjærnes et al., 2022; Nocella et al., 2010; Phillips et al., 2010; Robbins et al., 2016; Sandgren et

al., 2019; Settle et al., 2017; Wolff et al., 2024). Other authors approached trust based on the factors influencing the relationship between the trustee and the trusted (Benson-Greenwald et al., 2021; Mayer et al., 1995; McAllister, 1995).

The difference in the approach profoundly impacts the angle for each of the studies. For example, institutional and social trust have been used to study the relationship between institutions as entities or organizations and people interacting with them, such as clients and the general public (Benson-Greenwald et al., 2021). In contrast, other studies have examined trust by emphasizing the trustee's perceptions of the trusted individual's dependability and predictability, rather than focusing on organizations or entities (Benson-Greenwald et al., 2021). Furthermore, other researchers have approached trust by examining factors influencing the relationship between the trustee and the trusted based on the trustee's perceptions of expertise or knowledge (cognitive trust) of the trusted and the existing emotional connection or relationship (affective trust) with the trusted (Johnson & Grayson, 2005; McAllister, 1995).

Cognitive trust is established through continuous interactions because it is redundant and continuous in nature. McAllister (1995) described cognitive trust based on Lewis and Wiegert (1985, p. 970), stating that "we choose whom we will trust in which respects and under what circumstances, and we base the choice on what we take to be 'good reason,' constituting evidence of trustworthiness." Trust includes a level of vulnerability and is situational (Mayer et al., 1995; Rousseau et al., 1998; Siegrist et al., 2000). Cognitive trust starts with a specific experience and a person's choice to form reasoning from that event to trust someone (McAllister, 1995). In marketing, trust involves a "leap of faith" on the consumer's part (Johnson & Grayson, 2005). For example, Johnson and Grayson (2005) studied consumer trust in financial advisors. They reported that cognitive trust comes from knowledge, allowing a person to predict the other party's actions with some confidence.

Cognitive trust acknowledges the importance of reputation in building trust (Johnson &Grayson, 2005). Realizing the importance of reputation in trust building, several researchers in agricultural communication have assessed the impact of credibility in building trust (Gross & Roosen, 2021; Kjærnes et al., 2022; Nocella et al., 2010; Phillips et al., 2010; Robbins et al., 2016; Sandgren et al., 2019; Settle et al., 2017; Wolff et al., 2024). However, the instruments used when assessing trust in these studies often described trust broadly with little to no focus on cognitive or affective trust. Johnson and Grayson (2005) uniquely divided cognitive and affective trust in their survey. Distinguishing trust measurement items across different dimensions helps reveal the actual sources of trust or distrust among consumers. In agricultural communication research, the lack of such distinctions makes it challenging to identify the root causes of public mistrust and to develop effective strategies for addressing it.

While cognitive trust heavily relies on the trustee's leap of faith in the trustor's knowledge and skills on a specific topic or issue, affective trust is tied to emotional connection and genuine care for the individuals, which tends to be reciprocated (McAllister, 1995). The emotional ties in affective trust become the basis for that trust. These ties are strengthened by aspects of citizen behavior that go with group expectations (McAllister, 1995; Webber, 2008). As such, the trustee can trust an individual but not the institutions or entity associated with the trusted. However, as indicated above, research in agriculture has not distinctively examined affective trust but broadly by looking at aspects of trust such as institutional trust. Within agriculture, there has been

increased focus on exploring 'social trust,' which measures how the public trusts institutions responsible for managing aspects of people's lives (Gross & Roosen, 2021). Examining affective trust could provide insight into what trust may look like in agriculture, especially how it may influence consumers' information-seeking behaviors and choice of information sources. Such an assessment will assist in identifying how affective trust affects consumer trust or distrust in agriculture (Gross & Roosen, 2021; Robbins et al., 2016).

Examining trust from a cognitive and affective dimension is crucial, especially with reports indicating a decline in trust in the scientific community and institutions among the American public (Tyson & Kennedy, 2024). Declining trust is alarming and raises many questions about its impact on agriculture. However, it is not known whether the decline in public trust is due to the public's doubt of the expertise of scientists or whether it is because they feel that scientists do not care about their well-being. Understanding the source of public distrust requires researchers to pay attention to how the questions on these instruments are framed.

The language and phrasing employed within trust scales are critical in shaping how research participants perceive and measure trust. This study conceptualizes *framing* as the deliberate choice of words and sentence structures that can emphasize dimensions of trust, guiding participants' responses toward either cognitive or affective interpretations (Mayer & Tormala, 2010; Rocklage & Fazio, 2015). For instance, statements that elicit rational assessments, such as those focusing on perceived competence, reliability, or expertise (e.g., "I believe [source] has the necessary knowledge"), are likely to frame questions in a way that taps into cognitive trust (as defined for cognitive trust by Dirks & de Jong, 2022; Gross & Roosen, 2021; Johnson & Grayson, 2005; McAllister, 1995; Nocella et al., 2010; Webber, 2008). Conversely, phrasing that evokes emotional responses, personal connection, or perceived genuine care (e.g., "I feel a sense of comfort with [source]") is understood to frame questions in a manner more aligned with affective trust (aligned with the definition of affective trust by McAllister, 1995; Webber, 2008). The subtle distinctions in linguistic framing, such as the use of "I think..." versus "I feel..." statements, can implicitly direct respondents to access different underlying mechanisms of trust (Mayer & Tormala, 2010; Rocklage & Fazio, 2015).

Intentional language is important when separating and assessing cognitive and affective trust (Mayer & Tormala, 2010; Rocklage & Fazio, 2015). Specifically, focusing on the lexicon when separating these two dimensions is vital to accurately assessing them. However, there is a gap in agriculture trust-related studies due to limited definitions of trust dimensions being assessed, coupled with the use of quantitative surveys (Gross & Roosen, 2021; Kjærnes et al., 2022; Mayer & Tormala, 2010; McAllister, 1995; Nocella et al., 2010; Robbins et al., 2016; Sandgren et al., 2019; Settle et al., 2017; Webber, 2008; Wolff et al., 2024).

In quantitative research, respondents are provided with options that limit their ability to explain their responses. Therefore, assessing how these scales are framed will provide insight into the intentionality, or lack thereof, in distinguishing between cognitive and affective trust dimensions within agricultural communication research. This framing lens is crucial for understanding how existing trust measures may inadvertently conflate or isolate these distinct trust types.

Purpose and Objectives

The study was aimed at examining trust scales to determine how trust is assessed in agricultural communication research.

Specifically, the study sought to:

- Identify trust scales used in agricultural communication research.
- Establish the variables used to study trust within the various scales.
- Establish the differences in framing of trust variables in various scales.

Methods

In this qualitative study, an interpretive content analysis approach was employed to assess trust instruments. An interpretive content analysis includes statistical and thematic data and an iterative analysis to allow for deeper interpretation (Drisko & Maschi, 2016).

An iterative process was followed to obtain articles focused on trust from popular agricultural publication sources (Drisko & Maschi, 2016), such as Google Scholar and ERIC. Keywords included *trust scales in agriculture, trust instruments in agriculture, distrust in agriculture, perceptions of agriculture, trust in agriculture*, and *cognitive and affective trust in agriculture*. Each article was read to identify whether it contained items, scales, or instruments examining trust. Seven articles were identified and analyzed from the past fifteen years. The fifteen-year study period was set due to the rising distrust in agriculture (Muringai & Goddard, 2019). Inductive coding was used when analyzing the data, leading to the creation of descriptive narratives/themes to summarize the data (Drisko & Maschi, 2016). This approach allowed for trust scales to be analyzed based on language (Mayer & Tormala, 2010; Rocklage & Fazio, 2015) and manner of assessment. Validity and transferability were maintained by collecting descriptive data and peer debriefing (Onwuegbuzie & Leech, 2006).

Reflexivity Statement

The primary research is a graduate student studying Agricultural Communication with a focusing on consumer trust. She has a constructivist perspective, acknowledging that knowledge is socially created (Holt-Reynolds, 2000). The second researcher is an Assistant Professor of Science Communication. Her research explores factors influencing public perceptions and acceptance of scientific innovations and technology, especially focusing on the role of trust. She realizes that her interest in the topic may be a source of bias. The tertiary researcher is a graduate student whose research primarily focuses on identity and views much of their work through a transformative paradigm.

Findings

Trust scales used in agricultural communication research.

Seven trust scales focusing on agriculture were analyzed. Most scales were adapted from previous research, such as psychology, which were also previously validated (Gross & Roosen, 2021; Kjærnes et al., 2022; Robbins et al., 2016; Settle et al., 2017; Zoll et al., 2022). Five of the

trust studies were about controversial topics, such as farm animal welfare (FAW) (Gross & Roosen, 2021; Kjærnes et al., 2022; Nocella et al., 2010; Robbins et al., 2016; Zoll et al., 2022). However, some authors did not include questions on trust but followed a conceptual framework to interpret results about consumers' attitudes toward their views on trust (Nocella et al., 2010). While others made conclusions about trust when only one general question was asked (Gross & Roosen, 2021; Kjærnes et al., 2022; Sandgren et al., 2019).

Variables used to study trust within the various scales.

One major theme, '*absence of distinctive measurements of trust dimensions*,' emerged. Across the scales, a collective use of 'trust' that lacked division among different, distinct dimensions, such as cognitive or affective trust. The scales often had one construct that examined 'trust' or 'social trust'. Four scales had constructs comprising seven to ten Likert scale items, which measured trust or social trust as one construct (Gross & Roosen, 2021; Kjærnes et al., 2022; Robbins et al., 2016; Sandgren et al., 2019; Zoll et al., 2022). Other authors (Nocella et al., 2010; Settle et al., 2017) examined trust broadly without focusing on institutional or social trust. They compared knowledge of agricultural organizations to participants' trust' or 'distrust' of that organization in their trust cluster. Gross and Roosen (2021) used Siegrist et al.'s (2000) trust scale to measure social trust with items that read, "Farmers are interested in producing products with high animal welfare standards" and "Farmers take good care of their animals' welfare" (p. 126).

Establish the differences in framing of trust variables in various scales.

Although each scale was unique based on the topic of the study, a common theme emerged, namely, *use of positive frames focusing on expertise*. Researchers used positive statements, which focused on trust in expertise. For example, positive statements like "I trust…" statements by asking, "I trust that my community supported agriculture (CSA) does not overcharge for their products," and "I trust that my CSA can guarantee the safety of the food that they supply" (Zoll et al., 2022, p. 716). Furthermore, Robbins et al. (2016, p. 122) used positive statements like "Information about farm animal well-being from farmers is trustworthy" to assess FAW trust with questions. Gross and Roosen (2021) and Kjærnes et al. (2022) also used positive statements to assess trust focused on expertise, not emotion.

Conclusion/Recommendations/Implications

The results indicated that many scales were brief and did not distinguish the different dimensions of trust, hence approaching trust in abstract terms. Furthermore, some studies did not use any trust scales or only had one stand-alone question about trust in general. The results support previous literature stating that trust is often studied broadly, using terms such as 'general trust,' 'social trust,' or just 'trust' (Gross & Roosen, 2021; Kjærnes et al., 2022; Nocella et al., 2010; Phillips et al., 2010; Robbins et al., 2016; Sandgren et al., 2019; Settle et al., 2017; Wolff et al., 2024). In addition, "I think" and "I feel" language were not used in the scales or instruments despite being present in other fields, such as psychological studies that center around trust (Mayer & Tormala, 2010; Rocklage & Fazio, 2015). The lack of distinct trust dimensions, scale depth, and language intentionality may prevent agricultural researchers from thoroughly assessing and understanding sources of distrust and factors influencing consumers' trust in agriculture.

Including items in the trust measurement scales that focus on different dimensions and definitions of trust may provide agriculture with a deeper understanding of consumer needs for trust. Future research should focus on expanding trust scales to add different constructs to include multiple facets or dimensions of trust, such as affective and cognitive. Trust research often aims to address complicated and divisive topics to inform agricultural practices, so investing in research that intentionally measures trust may provide better answers to improve decision-making. In addition, researchers should work towards creating qualitative scales and completing qualitative studies to examine trust from a different perspective outside of quantitative research.

References

Abushal, L. T., Salama, M., Essa, M. M., & Qoronfleh, M. W. (2021). Agricultural biotechnology: Revealing insights about ethical concerns. *Journal of Biosciences*, *46*(3), 81.

Arnot, C., Vizzier-Thaxton, Y., & Scanes, C. G. (2016). Values, trust and science–building trust in today's food system in an era of radical transparency. *Poultry Science*, *95*(9), 2219-2224.

Benson-Greenwald, T. M., Trujillo, A., White, A. D., & Diekman, A. B. (2021). Science for others or the self? presumed motives for science shape public trust in science. *Personality and Social Psychology Bulletin,* 49(3), 344–360. https://doi.org/10.1177/01461672211064456

Dirks, K. T., & de Jong, B. (2022). Trust within the workplace: A review of two waves of research and a glimpse of the third. *Annual Review of Organizational Psychology and Organizational Behavior*, 9(1), 247–276. https://doi.org/10.1146/annurev-orgpsych-012420-083025

Drisko, J. W., & Maschi, T. (2016). *Content analysis*. Oxford University Press.

Gross, S., & Roosen, J. (2021). Effects of information on social trust in farmers regarding animal welfare. *International Food and Agribusiness Management Review*, *24*(1), 121–137. https://doi.org/10.22434/ifamr2020.0034

Hobbs, J. E., & Goddard, E. (2015). Consumers and trust. *Food Policy*, *52*, 71-74.

Holt-Reynolds, D. (2000). What does the teacher do?: Constructivist pedagogies and prospective teachers' beliefs about the role of a teacher. *Teaching and Teacher Education*, 16(1), 21–32. https://doi.org/10.1016/s0742-051x(99)00032-3

Johnson, D., & Grayson, K. (2005). Cognitive and affective trust in service relationships. *Journal of Business Research*, *58*(4), 500–507.

Kjærnes, U., Borgen, S. O., & Thorjussen, C. B. (2022). Behind a fluttering veil of trust: The dynamics of public concerns over farm animal welfare in Norway. *Sociologia Ruralis*, *62*(4), 763–781. https://doi.org/10.1111/soru.12405

Lewis, J. D., & Weigert, A. (1985). Trust as a social reality. *Social Forces*, *63*(4), 967. https://doi.org/10.2307/2578601

Mayer, N. D., & Tormala, Z. L. (2010). "Think" versus "feel" framing effects in persuasion. *Personality and Social Psychology Bulletin*, *36*(4), 443–454. https://doi.org/10.1177/0146167210362981

McAllister, D. J. (1995). Affect- and cognition-based trust as foundations for interpersonal cooperation in organizations. *Academy of Management Journal*, *38*(1), 24–59. https://doi.org/10.2307/256727

Muringai, V., & Goddard, E. (2019). Public knowledge and trust of agricultural and natural resources organizations. https://doi.org/10.7939/r3-3c2t-xs18

Nocella, G., Hubbard, L., & Scarpa, R. (2010). Farm animal welfare, consumer willingness to pay, and trust: Results of a cross-national survey. *Applied Economic Perspectives and Policy*, *32*(2), 275–297. https://doi.org/10.1093/aepp/ppp009

Onwuegbuzie, A. J., & Leech, N. L. (2006). Validity and qualitative research: An Oxymoron? *Quality & Quantity*, 41(2), 233–249. https://doi.org/10.1007/s11135-006-9000-3

Phillips, J. C., Ortega, A., Cook, M., Concepcion, M., Kimmons, T., Ralph, K., Ponce, J., Miller, H., Lam, M., & Baldwin, S. (2010). Activism and trust: Animal rights vs. animal welfare in the food supply chain. *Journal of Food Distribution*, *41*(01), 91–95. https://doi.org/10.5860/choice.43-3758

Robbins, J. A., Franks, B., Weary, D. M., & von Keyserlingk, M. A. G. (2016). Awareness of AG-gag laws erodes trust in farmers and increases support for Animal Welfare Regulations. *Food Policy*, *61*, 121–125. https://doi.org/10.1016/j.foodpol.2016.02.008

Rocklage, M. D., & Fazio, R. H. (2015). The evaluative lexicon: Adjective use as a means of assessing and distinguishing attitude valence, extremity, and emotionality. *Journal of Experimental Social Psychology*, *56*, 214–227. https://doi.org/10.1016/j.jesp.2014.10.005

Rousseau, D. M., Sitkin, S. B., Burt, R. S., & Camerer, C. (1998). Not so different after all: A cross-discipline view of trust. *Academy of Management Review*, *23*(3), 393–404. https://doi.org/10.5465/amr.1998.926617

Sandgren, E. P., Streiffer, R., Dykema, J., Assad, N., & Moberg, J. (2019). Assessing undergraduate student and faculty views on animal research: What do they know, whom do they trust, and how much do they care? *PLOS ONE*, *14*(10). https://doi.org/10.1371/journal.pone.0223375

Settle, Q., Rumble, J. N., McCarty, K., & Ruth, T. K. (2017). Public knowledge and trust of agricultural and natural resources organizations. *Journal of Applied Communications*, *101*(2). https://doi.org/10.4148/1051-0834.1007

Siegrist, M., Cvetkovich, G., & Roth, C. (2000). Salient value similarity, social trust, and risk/benefit perception. *Risk Analysis*, 20(3), 353–362. https://doi.org/10.1111/0272-4332.203034

Spain, C., Freund, D., Mohan-Gibbons, H., Meadow, R., & Beacham, L. (2018). Are they buying it? United States consumers' changing attitudes toward more humanely raised meat, eggs, and dairy. *Animals*, *8*(8). https://doi.org/10.3390/ani8080128

Tyson, A., & Kennedy, B. (2024, November 14). Public trust in scientists and views on their role in policymaking. Pew Research Center. https://www.pewresearch.org/science/2024/11/14/public-trust-in-scientists-and-views-on-their-role-in-policymaking/

Webber, S. S. (2008). Development of cognitive and affective Trust in teams. *Small Group Research*, *39*(6), 746–769. https://doi.org/10.1177/1046496408323569

Wolff, S. M., Breakwell, G. M., & Wright, D. B. (2024). Psychometric evaluation of the trust in science and scientists scale. *Royal Society Open Science*, *11*(4). https://doi.org/10.1098/rsos.231228

Wu, W., Zhang, A., van Klinken, R. D., Schrobback, P., & Muller, J. M. (2021). Consumer trust in food and the food system: a critical review. *Foods*, *10*(10), 2490.

Zoll, F., Kirby, C. K., Specht, K., & Siebert, R. (2022). Exploring member trust in German community-supported agriculture: A multiple regression analysis. *Agriculture and Human Values*, *40*(2), 709–724. https://doi.org/10.1007/s10460-022-10386-3