

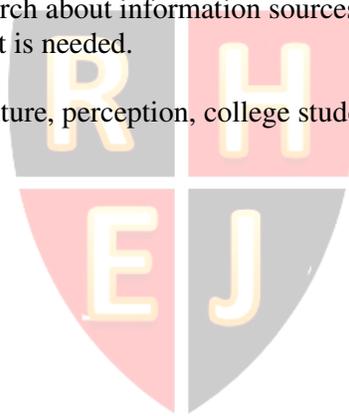
U.S. Midwesterners' knowledge and perception of U.S.-China agricultural trade issues

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U.S. college students might be more knowledgeable about international trade, especially in the U.S.-China context, than non-students in Midwestern states with high agricultural production. The purpose was to determine if relationships existed between knowledge and perceptions of the U.S.-China agricultural trade dispute. Purposive samples represented 10 U.S. Midwest states. Students' perceptions did not differ from the public; differences were in approval ratings of former President Trump's handling of the U.S. economy. Both groups were very unknowledgeable about the U.S.-China agricultural trade dispute. Significant relationships existed between the variables of interest. Americans need to expand their knowledge of the largest markets (Canada, China, and Mexico) for U.S. agricultural exports. More research about information sources and the impacts of science communication and engagement is needed.

Keywords: China, trade, agriculture, perception, college students



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INTRODUCTION

U.S. colleges of agriculture provide opportunities to learn about agricultural production, global trade, and market issues. Before the outbreak of the novel coronavirus in 2020, media were focused daily (e.g., *The Wall Street Journal*, *USA Today*, *MSNBC*, *FOX News*) and weekly (e.g., *Washington Examiner*, *Time*) on the U.S.-China trade dispute that dominated news reports from late 2017 (Hansen et al., 2017) to 2018 (Marchant & Wang, 2018; Friedhoff & Kafura, 2018; Wike & Devlin, 2018). U.S.-China trade issues were most evident in U.S. Midwest corn, soybean, and pork producing states (Balistreri et al., 2018; Qu et al., 2019). American farmers may have been impacted more by the U.S.-China trade dispute, but all were affected by tariffs imposed on foreign goods throughout 2018-2019.

U.S. students' knowledge about global trade, especially in the U.S.-China context, may be associated with their postsecondary studies, attitudes about China, and/or demographics. The researchers speculated that college students were more knowledgeable about trade with China and related issues than were non-students, yet both groups were consumers. Supply, demand, and consumption of goods and services may be associated with one's knowledge of international trade policies. Do Americans know about the negative effects of tariffs on trade? If so, does it affect their purchases of foreign-based goods and services to offset the effects of tariffs on their personal finances? What did Americans in the U.S. Midwest know about the U.S.-China trade dispute? Do important links exist between knowledge and perceptions of the U.S.-China trade dispute and/or selected demographics?

LITERATURE REVIEW

American's perceptions of international trade and agricultural production issues fluctuate with consumers' changing tastes, education levels, media use, and sometimes because of leaders' statements. For example, a survey of U.S. citizens showed 44% said they had some information about Genetically Modified Organisms (GMOs) in 2001, but 9% said they had a lot of information about GMOs (Wunderlich & Gatto, 2015). In 2015, those numbers increased; 52% of Americans said they had some information, and 29% said they knew a lot about GMOs (Funk & Kennedy, 2016). These substantial increases in perceived knowledge resulted in more positive perceptions of GMOs. Educational campaigns by science-based entities such as the United States Department of Agriculture (USDA) and the Food and Drug Administration (FDA) contributed to changing American's perceptions of GMOs. Could similar knowledge increases be replicated in the U.S.-China trade dispute? Part of the answer lies in knowing Americans' opinions of the U.S. economy, international and/or agricultural trade, and China.

What did Americans think about the U.S. economy and/or former President Trump's handling of the U.S.-China trade dispute? In mid-July 2018, the *Wall Street Journal* found 53% ($\pm 3.27\%$) of respondents (poll of 900 registered voters) opposed President Trump imposing tariffs on foreign products, believing such actions would hurt average Americans (Bender, 2018). One-third supported his actions, thinking that tariffs helped average Americans. If the majority of American's opposed the U.S.-China trade dispute, they should have demanded to end it, possibly by pressuring state and national leaders to counter the president's actions. Lai (2019) offered another view,

...a majority of people [Americans] do not support the trade war, but they do not feel strongly enough about the issue to change their mind about whether or not to vote for Trump or the Republicans as long as the trade war does not affect the broader economy, which is booming now. (p. 173)

This view included those adversely affected by the trade dispute, such as soybean farmers in U.S. Midwest states. Helm et al. (2019) reported that nearly 9 in 10 Americans (87%) believed international trade was good for the U.S. economy; 83% thought international trade was good for American companies. Americans across the political spectrum supported trade with other countries, regardless of their support for President Trump, because trade is a positive force for the U.S. economy and businesses. However, the president's actions against U.S. trading partners in 2018-2019 created impediments to engaging in international trade. Helm et al. reported strong bipartisan support (89%) for international trade as being good for U.S. relations abroad; 51% of respondents opposed tariffs on Chinese products at that time.

Agricultural producers' experiences influenced their perceptions of trade with China. Qu et al (2019) polled 774 farmers from Iowa, Minnesota, and Illinois to gauge Midwestern farmers' perceptions of the U.S.-China trade dispute. More than 90% reported being moderately to extremely informed about the trade dispute. Nearly 60% supported raising tariffs on Chinese products, although more than 80% thought the trade dispute adversely affected net farm income in 2018. Also, more than 80% wanted normal trade relations (U.S.-China) to resume. Regarding U.S. public perception of China, Wike and Devlin (2018) found younger people perceived China more favorably (49% of those 18-29), while older respondents (47% of 30 and older) had unfavorable views.

Does knowledge about international trade and/or the economy correlate with perceptions about such issues? Helm et al. (2019) found most people were unknowledgeable about trade agreements, even with China, despite former President Trump's nearly daily public tweets and resultant tariffs on Chinese products. The researchers posit that Americans' lack of knowledge about trade and agriculture negatively influenced their perceptions of former President Trump's handling of the economy or U.S.-China trade relations. Knowledge of U.S. agriculture's role in international trade is critical when evaluating validity of opinions about the U.S.-China trade dispute.

College students studying agriculture in the U.S. Midwest should have more knowledge about U.S.-China agricultural production, trade, and related issues than do non-college people in the U.S. Midwest. Research is scant on U.S. postsecondary students' knowledge about agriculture in China. University of Florida students ($n = 7$) had positive gains in perceived and actual knowledge of China and Chinese agriculture, following a two-week trip in May 2011. Coers et al. (2012) did not ask knowledge questions about U.S.-China trade. Qu et al. (2019) asked Midwest farmers three knowledge questions about agricultural trade with China (e.g., China's tariff rates on U.S. soybeans, soybean producers' payment/bushel in the 2018 Market Facilitation Program, and percent of U.S. soybean exports sent to China in 2016 before trade disruption). Qu et al. (2019) found "respondents very knowledgeable about their farm operations and the levels of the trade aid payments they received" (p. 13). Observations, including gaps in Americans' knowledge and perceptions of the U.S.-China trade dispute, connections between countries' agricultural industries, and international markets, amplified the need for this study.

METHODS

The purpose of this study was to determine if relationships existed between knowledge and perceptions of the U.S.-China agricultural trade dispute. The research objectives were to:

- (1) Assess respondents' perceptions of the U.S.-China trade dispute.
- (2) Test respondents' knowledge of U.S.-China agricultural trade issues.
- (3) Determine if significant relationships existed between knowledge and perceptions of the U.S.-China trade dispute.

- (4) Determine if significant relationships existed between participants' perceptions of the U.S.-China trade dispute and selected demographic variables.

In addition to the research objectives, three hypotheses were tested:

H_{a1}: Knowledge of U.S.-China agricultural trade issues and perceptions of the U.S.-China trade dispute are associated.

H_{a2}: Knowledge of U.S.-China agricultural trade issues and demographic variables are associated.

H_{a3}: Perceptions of the U.S.-China trade dispute and demographic variables are associated.

Design and Sample

A cross-sectional survey and correlational design (Field, 2000) were used in this study. Survey research is one of the most common forms of research engaged by educational researchers (Fraenkel et al., 2019). A cross-sectional survey allowed for information collection from a sample drawn from a predetermined population.

Participants represented multiple purposive samples (i.e., college of agriculture students and non-students from a quota sample provider). To access college of agriculture students, the researcher searched departmental websites of land-grant universities and state colleges in 12 states (i.e., Iowa, Illinois, Indiana, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin). These states represent the U.S. Midwest region, according to the U.S. Census Bureau (www2.census.gov), where agricultural production was most likely affected by the U.S.-China trade dispute.

A search of university and college departmental websites for agriculture business, agricultural economics, and general agriculture sciences produced a list of ~40 faculty contacts. Email invitations were sent with an IRB approval letter, the survey consent script, and an anonymous survey URL in March 2020. University and college of agriculture contacts were asked to distribute the online invitation widely with their college of agriculture students; two email reminders were sent about one week apart from the original invitation. Additionally, to boost students' awareness of the study, similar email invitations were sent to ~30 contacts for agriculture-related student organization leaders and/or advisors (e.g., Alpha Gamma Rho fraternity, Sigma Alpha sorority), beginning April 1st with follow-up reminders every three weeks. Students' contacts were derived from website searches of the school's organizational chapter pages. Positive email responses were received from faculty and/or student leaders in all states except Michigan and South Dakota. As a result, those states were not included in the quota sample for the public (i.e., non-students).

Students' data collection ceased in mid-May 2020, about two months after the initial invite. Total responses were 175, which was reduced to 131 (75% response rate) because of partial or incomplete data. The results are confined to the respondent group because of the sampling method and uncertainty about how many students may have viewed the invitation but declined to participate in the survey. All students were at least 18 years old and enrolled in a U.S. Midwest postsecondary agriculture program.

In early May 2020, an online sample provider (Marketing Systems Group) began collecting a quota sample ($N = \sim 300$) from U.S. Midwest participants. A target of 30 valid responses from each of 10 U.S. Midwest states (see Michigan and South Dakota exclusion) was determined before data collection. Marketing Systems Group was instructed to include a representative sample of rural participants (i.e., any population, housing, or territory NOT in an urban area; U.S. Census Bureau, 2020), which was about 19% of the population. Marketing Systems Group used various advertising sources, including website intercept

recruitment, member referrals, targeted email lists, gaming sites, customer loyalty web portals, permission-based networks, and social media, to attract study participants.

Quota sample data collection ceased in mid-May 2020, about 10 days after the initial invite. Total responses were 432 which was reduced to 305 (71% response rate) because of invalid responses. All participants were representatives of the public, at least 18 years old, and living in the U.S. Midwest. Participants' responses ($N = 432$, quota; $N = 175$, students) were analyzed for completeness of opinion and/or knowledge. Respondents were eliminated from data analyses if input included: 1) four or more *not sure* responses to the six perception statements about U.S.-China agricultural trade ($n = 17$, quota; $n = 13$, students); 2) four *not sure* responses to the six statements about U.S.-China trade ($n = 9$, quota; $n = 14$, students); 3) four missing responses to the six U.S.-China agriculture knowledge questions ($n = 63$, quota; $n = 7$ students); 4) four blank responses to the six U.S.-China general knowledge questions ($n = 2$, quota; $n = 0$ students); or 5) if respondents started, but failed to complete the instrument within two weeks ($n = 36$, quota; $n = 10$ students). Usable data produced a 71% response rate ($n = 305$) for the quota sample and a 75% response rate for college of agriculture student sample ($n = 131$). Results are confined to respondent groups because of non-probabilistic sampling methods.

Instrumentation

The online instrument had multiple sections to measure knowledge and perceptions of the U.S.-China agricultural trade dispute. Questions were derived from various sources (Kafura, 2019a, 2019b; Lai, 2018; Li et al., 2019; Zhang, 2019; Zhang & Li, 2018) and researcher-developed questions (demographics). Following two qualifying questions (i.e., Consent and State), the Perceptions of U.S.-China Agricultural Trade Issues section contained 12 statements about U.S.-China trade issues. Six statements were derived from Qu et al. (2019) and six statements were created to counter the original statements. Respondents rated their agreement levels using a 5-point, Likert-type scale (Strongly Disagree... Strongly Agree). Example statements included "Nothing good will come of the ongoing U.S.-China trade dispute" and "The U.S. economy will suffer more than China's economy because of the ongoing trade dispute."

Perceptions of U.S.-China Trade Issues were measured with seven questions derived from Lai (2018) and Kafura (2019a, 2019b). Open-ended statements or questions were presented to measure respondents' general views about tariffs, President Trump's handling of trade and the U.S. economy, and beliefs about trade with China. Each item featured multiple-choice responses (3-4 items per question) ranging from approve to disapprove, oppose to support, favor to oppose, and not sure (Kafura, 2019a, 2019b). Sample questions included "Do you favor or oppose engaging in trade with China?" and "Do you approve, disapprove, or have no opinion of President Trump's handling of the U.S. economy?"

Knowledge of U.S.-China agricultural trade issues was measured with 12 questions ranging from agriculture-specific content (e.g., China was the world's leading producer of [rice] in 2018), to general knowledge (e.g., China's 1.4 billion population is more than [four] times larger than that of the United States.). Other questions included U.S.-China trade imbalances, trading partners, percent of agricultural workforce, and agricultural commodities. All knowledge questions were derived from published reports (Lai, 2019; Li et al., 2019; Zhang et al., 2019) news stories (*Wall Street Journal*, 6 Feb 2020) about the U.S.-China trade dispute. Responses were random ordered and recorded as binary variables (0 = incorrect, 1 = correct).

Respondents' scores were summed for each perception subscale and the total knowledge score to answer research objectives three and four. Cronbach's alpha coefficient

was used to determine subscale reliabilities because alpha is commonly reported for scales measuring attitudes (Taber, 2018). Scores for perceptions of U.S.-China agricultural trade issues were determined after reverse-coding four items (see Table 2). Cronbach's alpha coefficient for perceptions ($M = 35.76$, $SD = 9.03$) of U.S.-China agricultural trade issues was .85, which was deemed reliable for data analyses and interpretation. Perceptions of U.S.-China trade issues were determined after reverse-coding six questions/statements to represent a positive U.S. perception (e.g., American economy, President Trump's actions on trade/economy, strengthening U.S. national security). One question (i.e., Which country is a stronger economic power, China, the U.S., or are they about equal?) was excluded from the summed trade issues subscale ($M = 16.36$, $SD = 3.20$) because it decreased reliability below acceptable levels ($\sim .60$). Cronbach's alpha for perceptions of trade issues was .66, which was acceptable for data analyses and interpretation, based on Ursachi et al.'s (2015) comment that "...alpha of 0.6-0.7 indicates an acceptable level of reliability" (p. 681). Overall knowledge ($M = 4.88$, $SD = 2.18$) of U.S.-China trade issues was measured by summing 12 knowledge questions. An acceptable (Taber, 2018) reliability level ($KR20 = .49$) for knowledge was attributed to the degree of item difficulty, heterogeneous items, item discrimination (Frisbie, 1988), and limited questions (Ary et al., 2010).

Content and face validity were established by a panel of experts from southern U.S. land-grant universities. The expert panel included faculty who taught international agriculture courses or who had international agriculture development experience. A pilot test of the instrument was conducted with faculty and students in agriculture-related disciplines at southern U.S. land-grant universities before data collection. Edits were made to the final research instrument.

Data Collection and Analyses

Data were collected through anonymous surveys (Qualtrics). Participants' average response time was about 10 minutes. There was no compensation or other incentives for college of agriculture students. Participants recruited by the quota sample provider may have been compensated (by the provider) with cash, airline miles, points for online retail purchases, etc. The researchers did not control the incentive amount or type to participants in the quota sample.

Descriptive and bivariate analyses were used to report the data. An alpha level of .05 was established *a priori*. Analyses focused on associations between participants' knowledge and perceptions of the U.S.-China trade dispute, or between participants' knowledge or perceptions of the U.S.-China trade dispute and selected demographic variables.

RESULTS

Respondents, as indicated in Table 1 (Appendix), were college of agriculture students ($n = 131$) and/or the public ($n = 305$) from 10 Midwestern U.S. states, with Iowa ($n = 25$), Kansas ($n = 35$), and Wisconsin ($n = 26$) each contributing about 20-25% of all responses for the student sample. In total ($N = 436$), respondents were described as white (89%), female (58%), 18-24-year-old students (35%), and from non-rural (70%) residences. Respondents recorded their employment status and were asked if they considered themselves as a Republican, Democrat, Independent, Other. Other than student (34%) as an employment status, participants primarily were employed full time (27%) or retired (19%). Overall, respondents affiliated with being Republican (37%), Democrat (30%), or Independent (28%). Overwhelmingly (48%), college students considered themselves as Republicans, while the public sample was distributed somewhat evenly (~ 30 -35%) across three affiliations

(Republican, Democrat, and Independent). Finally, respondents indicated if their family was actively engaged in agriculture. As expected, the majority (70%) of college of agriculture students affirmed their family's active engagement in agriculture, while the opposite (~10%) was true for the public. Table 1 (Appendix) shows the demographic profile (descending total counts/variable) by respondent group.

The first research objective was to assess respondents' perceptions of the U.S.-China trade dispute. The first of three sections asked respondents to indicate their agreement levels with 12 statements about U.S.-China agricultural trade issues using a 5-point Likert-type (Strongly Disagree...Strongly Agree) scale. Table 2 (Appendix) shows descriptive statistics (descending grand means) for perceptions of U.S.-China agricultural trade issues by respondent group. Generally, college of agriculture students' perceptions did not differ from the public. The public had higher overall mean scores for all but three statements (American farmers will bear the burden of the tariffs imposed by the Chinese government; The trade dispute will make U.S. agriculture lose markets to other competitors; and U.S. agriculture will become more competitive globally because of the ongoing U.S.-China trade dispute). Members of the public agreed ($M = 3.51-4.50$), while students were uncertain ($M = 2.51-3.50$) with two statements; American consumers bear the cost of tariffs imposed on Chinese products by the U.S. government, and U.S. and Chinese tariffs imposed on each other's products will have long term negative effects on U.S. agriculture as indicated in Table 2 (Appendix).

The second section for perceptions of the U.S.-China trade dispute included seven questions derived from previous studies (Kafura, 2019; Lai, 2019). Each statement related to views about U.S.-China trade issues and featured multiple-choice responses (3-4/question) ranging from approve to disapprove, oppose to support, favor to oppose, and not sure. Table 3 (Appendix) shows frequency distributions (descending total counts/statement) for perceptions of U.S.-China trade issues by respondent group. The majority (52%) believed that raising tariffs and barriers on imports from other countries will do more to raise the costs of consumer goods and hurt the U.S. economy. One-half (50%) opposed former President Trump's tariffs because they thought it would hurt the average American. Oddly, about equal percentages approved (47%) of former President Trump's handling of the U.S. economy but disapproved (46%) of his handling of U.S.-China trade. The majority (65%) favored engaging in trade with China. Most thought that U.S.-China trade did more to strengthen U.S. national security (38%), and that the U.S. was a stronger economic power (40%) as indicated in Table 3 (Appendix).

Our second objective was to test respondents' knowledge of U.S.-China agricultural trade issues. The researchers asked 12 knowledge questions about U.S.-China agricultural trade and other related issues. Each question had four, random ordered, multiple-choice responses. The researchers asked general questions about China's population relative to the U.S. (China's population is about four times larger than the U.S.; ~50% answered correctly), and about the agricultural workforce (~2% in U.S., ~20% in China; ~40% answered correctly). Other questions focused on trade imbalances, such as the annual value of China's exports to the U.S. (~\$500B/year) versus its imports from the U.S. (~\$200B/year). Some questions revealed biases toward China. For example, the researchers asked about trade partners; "In early 2020, the top U.S. trade partner was [Mexico]" (~22% answered correctly). About 6 in 10 (59%, $n = 259$) chose China incorrectly as indicated in Table 4 (Appendix). The researchers included agricultural commodities (soybeans and pork), reported as being affected severely by the U.S.-China trade dispute (Balistreri et al., 2018; Zumbrun, 2020). "[China] is the world's leading producer of pork" (29% answered correctly). More than 6 in 10 (62%, $n = 268$) incorrectly selected the U.S. Table 4 (Appendix) shows

frequency distributions (descending total counts) for correct responses (in brackets) to 12 knowledge questions about U.S.-China agricultural trade and related issues.

One question was deemed too easy ($P > 70\%$; China was the world's leading producer of [rice] in 2018), and three questions ([Mexico] was the top foreign market for U.S. pork exports; In early 2020, the top U.S. trade partner was [Mexico]; and [China] is the world's leading producer of pork) were too difficult ($P < 30\%$), according to research on multiple-choice question item difficulty and item discrimination (Hingorjo & Jaleel, 2012; Musa et al., 2018; Pande et al., 2013).

College students were significantly ($p < .00$) more knowledgeable ($M = 5.45$, $SD = 2.34$) about U.S.-China agricultural trade issues than were members of the public ($M = 4.64$, $SD = 2.01$), although all scored well below average knowledge (i.e., 75% correct = 9/12 questions). About 12% of students ($n = 15$) and 5% of the public ($n = 16$) achieved passing knowledge scores. However, college education revealed itself in three questions: students outscored the public (64% to 43%) that China's population was 4 times larger the U.S.; China's reliance on the U.S. and Brazil to supply its soybeans (68% to 38%); and China was the world's leading producer of pork (53% to 19%) as indicated in Table 4 (Appendix). More than 70% of the public thought the U.S. was the world's leading pork producer. Not surprising, but still disheartening, college students' lack of knowledge about international topics in this study mirrors previous works (Chang et al., 2013; Connors, 2004; Mason et al., 1994; Moore et al., 1996; Morales et al., 2017; Author et al., 2003; Author et al., 2006) since the mid-1990s.

Our third objective was to determine if significant relationships existed between knowledge of U.S.-China agricultural trade issues and perceptions of the U.S.-China trade dispute. Relationships between continuous-continuous variables were reported as Pearson product-moment correlation coefficients (Khamis, 2008). Effect size (i.e., magnitude or strength of a significant relationship) interpretations were described according Davis (1971) or Rea and Parker (1992).

A significant low association ($r = .11$, $p < .02$) was found between knowledge of U.S.-China agricultural trade issues and perceptions of the U.S.-China trade dispute as indicated in Table 5 (Appendix). The first research hypothesis was supported; knowledge of U.S.-China agricultural trade issues and overall perceptions of the trade dispute varied proportionally to respondents' knowledge (low vs. high) and views (negative vs. positive) on the matter. A significant, inverse, low association existed between perceptions of trade issues and perceptions of agricultural trade ($r = -.20$, $p < .00$). See Table 5 (Appendix).

The fourth objective was to determine if relationships existed between knowledge and/or perceptions of the U.S.-China trade dispute and selected demographic variables. Relationships between continuous-continuous variables were reported as Pearson product-moment correlation (r) coefficients; continuous-nominal (dichotomous) variables were reported as point-biserial correlations (r_{pb}); Spearman rho (r_s) was used to report relationships between continuous-ordinal variables; Cramer's V (ϕ_c) was used for relationships between nominal (dichotomous) and nominal (multi-categorical) variables (Khamis, 2008). Political affiliation and residence were dummy-coded (1 = yes, 0 = no) as nominal dichotomous variables.

A significant, albeit weak association ($\phi_c = .14$, $p < .01$), existed between knowledge of U.S.-China agricultural trade issues and employment status (college student); low positive relationships existed between knowledge and perceptions of trade ($r_{pb} = .11$, $p < .02$), and knowledge and rural residence ($r_{pb} = .10$, $p < .03$) as indicated in Table 6 (Appendix). The second research hypothesis was supported; college students, those with positive perceptions

of trade, and/or those living in rural areas were more knowledgeable about U.S.-China agricultural trade issues.

Significant moderate relationships existed between perceptions of agricultural trade and identifying as a Republican ($r_{pb} = -.38, p < .00$) or Democrat ($r_{pb} = .40, p < .00$); and low associations existed between perceptions of agricultural trade and living in a city ($r_{pb} = .15, p < .00$) or rural areas ($r_{pb} = -.14, p < .00$), and trade in general ($r_{pb} = -.20, p < .00$). Those who identified as Republicans had significantly more negative perceptions of agricultural trade ($M = 31.24, SD = 7.21$); Democrats had significantly more positive perceptions ($M = 41.36, SD = 7.68$) as indicated in Table 6 (Appendix). The researchers confirmed the third hypothesis that perceptions of the U.S.-China trade dispute and selected demographic variables were associated.

DISCUSSION AND CONCLUSIONS

The most obvious finding was respondents' lack of knowledge about U.S.-China agricultural trade and related issues. Knowledge was distressingly less than expected, given media and former President Trump's almost daily reporting of it during data collection. Our findings supported Helm et al. (2019), who found most people were unknowledgeable about trade agreements, even with China, despite numerous media reports about U.S.-China agricultural trade and related issues. Guessing alone should produce a 25% correct response rate (3/12) with four multiple-choice responses per question. The public scored (4.64/12) slightly better than guessing and college students achieved less than 50% correct (5.45/12). The researchers concede that three questions were likely too difficult to answer, but only because of the choices provided. The top foreign market for U.S. pork could fluctuate occasionally; however, our choices (Canada, China, Japan, or Mexico) could have been limited to China or Mexico based on population alone. China is the most populous and Mexico was the tenth most populous country during our study. About one in five respondents knew or guessed the correct choice (Mexico), while most chose China. Again, most respondents (students and public) chose China as the top U.S. trade partner in early 2020, rather than correctly choosing Mexico. The researchers affirm Zhang's (2015) views that there is a lack of understanding of China's agricultural industry, despite the interconnectedness of both countries' agricultural industries, both of which are heavily involved in international trade. Americans should expand their knowledge of our largest markets (Canada, China, and Mexico) for U.S. agricultural exports (Chepeliev et al., 2019; Torry, 2020).

U.S. Midwesterners, and most Americans, could have biased views and knowledge about China, while ignoring our nearest trading partners (Canada and Mexico) because of skewed news reports, political leaders' opinions, or other factors (disinterest in international trade, apathy about politics, socioeconomic, etc.). For example, Canada and Mexico (Balistreri et al., 2018; Chepeliev et al., 2019; Helm et al., 2019; Mildner & Schmucker, 2019; Zumbrun, 2020) have longer trading histories, greater economic importance, and preferred partner status with the U.S. than does China (Dezember & Maltais, 2020; Hansen et al., 2017; Newman, 2021; Zhang, 2019). Our results confirmed Lai's (2019) views that most people did not feel strongly enough about the U.S.-China agricultural trade war, if it did not affect the broader economy, which was booming at that time. More research is needed to examine the specific reasons for U.S. Midwesterners' lack of knowledge about trade issues that affected them most. Certainly, there is cause for concern in postsecondary agriculture students' lack of knowledge about these issues. An uninformed populous that is unable to discern fact from fiction can be led astray by powerful personalities and biased media, resulting in policies detrimental to our collective growth and prosperity. America's

knowledge quest about China and her agricultural industry must be an ongoing pursuit. “China is a country of rapid change...knowledge that was accurate even five years ago may not apply to today” (Zhang, 2019, p. 3).

College of agriculture students strongly agreed that American farmers bore the burden of tariffs imposed by the Chinese government, while the public strongly agreed that American consumers bore the cost of tariffs imposed on Chinese products by the U.S. government. These views indicate that college of agriculture students understand better U.S.-China agricultural trade issues, as not all tariff costs are passed solely to consumers. Both groups were uncertain that U.S. and Chinese tariffs imposed on each other's products would have long term negative effects on U.S. agriculture. However, when asked about the effects of raising tariffs and barriers on imports, the majority believed doing so would do more to raise the costs of consumer goods and hurt the U.S. economy, confirming previous studies (Kafura, 2019a, 2019b; Helm et al., 2019). This disconnect requires deeper investigation to know if U.S. Midwesterners truly distinguish differences between agricultural trade and trade in general.

Concerning respondents' perceptions of U.S.-China agricultural trade, the economy, and former President Trump's handling of such issues, our findings confirmed previous studies (Bender, 2018, 2019; Kafura, 2019a, 2019b; Friedhoff & Kafura, 2018; Helm et al., 2019; Lai, 2019; Mildner & Schmucker, 2019; Silver et al., 2019). The majority opposed former President Trump's actions (tariffs) because they hurt the average American, disapproved of his handling of U.S.-China trade, favored engaging in trade with China, and believed that U.S.-China trade did more to strengthen U.S. national security. College students and the public were split on their opinions of former President Trump's handling of the U.S. economy (students approved, public disapproved) and which country was a stronger economic power (students believed U.S. and China were equal economic powers; public said U.S.). Given the consistency of Americans' perceptions, as reported by the Pew Research Center, The Chicago Council on Global Affairs, and others (Iowa State University), the researchers wonder how influential media and/or former President Trump was in shaping public opinion (Zitner, 2018). Additional research is needed to determine sources of and influential forces shaping our perceptions of U.S.-China agricultural trade and related issues. Unfounded rhetoric about one country's policies or ideologies that is contrary to the other, breeds nationalistic tendencies in the U.S. and China alike (Lai, 2019). The same is true for trade relations between the U.S. and others (Mexico and Canada; Chepeliev et al., 2019).

Knowledge of U.S.-China agricultural trade issues and perceptions of the U.S.-China trade dispute were related, but not strongly. The lack of a stronger relationship might be attributed to the research instrument, especially the knowledge portion. As previously described, some questions were too difficult (based on response choice), while others may have been too discrete (e.g., percent of labor force in agricultural production). Future iterations of the knowledge portion should seek to refine reliability. Respondents' preferred information sources for learning about international issues, such as the U.S.-China trade dispute, their frequency of media use, and trustworthiness of media type, may influence significant relationships between the variables of interest. The researchers know that associations do not indicate cause and effect. Future research should determine why those relationships exist and if causal relationships are produced.

Significant, but conflicting relationships existed between perceptions of agricultural trade and political party affiliation. Republicans had negative, while Democrats had positive perceptions of agricultural trade. Silver et al. (2019) found that both Republicans and Democrats had unfavorable views of China, but Republicans' opinions were somewhat more negative (70%) of China, compared with 59% of Democrats. Political party affiliation had a stronger influence on perceptions of agricultural trade than was found with residence (rural

vs. urban). The researchers suspect that Republicans' negative perceptions about agricultural trade were influenced by news reports of the U.S.-China trade dispute, combined with former President Trump's appeal among Republicans (Bender, 2018, 2019) and his disdain for trade imbalances with China (Lai, 2019; Mildner & Schmucker, 2019).

Implications

What are the implications of this study? First, the U.S. and China will not decouple our markets or trading arrangements (Mildner & Schmucker, 2019). Chinese and Americans alike benefit from international trade between our countries. Hence, there is a need to increase our collective knowledge of China, agricultural trade, and related issues affecting Americans and Chinese alike. Knowledge of U.S.-China agricultural trade issues was related to perceptions of trade, employment status (college student), and residence (rural). Likewise, perception of agricultural trade was related to one's perceptions of trade in general, political affiliation (Republican and Democrat), and residence (rural and urban).

The single largest issue is to improve U.S. Midwesterners' knowledge of international agricultural trade, especially U.S.-China trade, but also increase knowledge of trade related issues with Canada and Mexico. The researchers argue that factual understanding of these issues is aligned with valid perceptions of U.S.-China or U.S.-other country relations, trade, and agriculture. In other words, our public and college students should not and cannot accept misinformation when forming valid opinions about U.S.-China agricultural trade issues, or other international matters.

Second, simply increasing stories about U.S.-China agricultural trade issues, vis-à-vis expanded media coverage, does not guarantee increased public knowledge about China. Willnat and Metzgar (2016) found no evidence that Americans with more exposure to news about China also knew more about China. Those who were "more knowledgeable about China tend to be more critical of Chinese foreign and economic policies" (p. 26). How does the public become knowledgeable about such issues? A need exists to research participants' information sources to determine if fact-based reports are disseminated and consumed equally to non-factual reports. Changing one's perceptions takes time, but as noted elsewhere (Funk et al., 2019; Funk & Kennedy, 2016; Krause et al., 2019), more factual knowledge about science, research, and policy-driven actions, produces more favorable perceptions and trust of those working in such matters. Conversely, those with less knowledge tend to distrust science, research, and the policies derived from it.

The researchers note that knowledge deficiencies in science, research, and policy formation are not uniquely American issues, they exist in China too. Zhu et al. (2017) found Chinese consumers worried about the safety of food grains and genetically modified (GM) cereals because of social media reports of food scandals and lack of knowledge about grain quality or safety. Consumers hoped their government would ensure food safety by borrowing from foreign experiences. Zhu et al. (2017) discovered that rural respondents were less anxious about grain quality because they had more knowledge about grain production and processing. Their perceptions were influenced by negative social media reports about GM foods, despite positive reports from official sources. The need to educate our publics and college students in matters of U.S.-China agricultural trade and related issues cannot be understated. The researchers think that too many invalid reports with non-factual information are being consumed by the public. Some of that non-factual reporting is repeated by leaders, making it difficult for the public to form valid opinions or make informed decisions.

Third, a need exists to improve U.S. Midwestern college of agriculture students' and the public's deficient knowledge about international agricultural trade and related issues. While an educational effort is needed in specific courses or majors (i.e., agricultural business,

agricultural economics, business, economics), higher education needs to develop curricula, learner experiences, and workshops to help journalists improve their understanding of science, research processes, and policy formation to disseminate such information more accurately to the public. Recently, the American Academy of Arts and Sciences (2020) found that 54% of U.S. adults said they get their science news from general news outlets, but only 28% believe general news sources get their science facts right most of the time. The Academy suggested an actionable item to “account for the decline in knowledge-based journalism...providing journalists with a deeper understanding of the scientific process, data collection, and scientific uncertainty can help protect against mischaracterizations in science journalism” (p. 23). Finally, the researchers conclude and concur with the Academy’s findings that additional study is needed to understand the impacts of science communication and engagement, including the public’s interest, understanding, and support for science, to which the researchers add public understanding of international agricultural trade.

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REFERENCES

- American Academy of Arts and Sciences. (2020). *The public face of science in America: Priorities for the future*. Cambridge, Mass.: American Academy of Arts and Sciences. <https://www.amacad.org/project/public-face-science>
- Ary, D., Jacobs, L. C., & Sorenson, C. (2010). *Introduction to research in education*. (8th ed.). Belmont, CA: Wadsworth, Cengage Learning.
- Balistreri, E. J., Hart, C. E., Hayes, D. J., Li, M., Schulz, L., Swenson, D. A., Zhang, W., & Crespi, J. M. (2018). *The impact of the 2018 trade disruptions on the Iowa economy* [Policy brief]. *CARD*. https://lib.dr.iastate.edu/card_policybriefs/21
- Bender, M. C. (2018, July). *Donald Trump’s approval rating inches higher, buoyed by Republican support*. The Wall Street Journal/NBC News Poll. <https://www.wsj.com/articles/the-wall-street-journalnbc-news-poll-1378786510>
- Bender, M. C. (2019, April). *Voter approval rising for Trump’s handling of the economy*. The Wall Street Journal/NBC News Poll. <https://www.wsj.com/articles/the-wall-street-journalnbc-news-poll-1378786510>
- Chang et al. (2013). Agriculture students’ interests, preferences, barriers, and perceived benefits of international educational experiences. *NACTA Journal*, 57(3a), 97-103.
- Chepeliev, M., Tyner, W. E., & van der Mensbrugge, D. (2019). Possible implications for U.S. agriculture of U.S. trade policies: Smoot–Hawley all over again? *Choices*, 34(2), 1-8.
- China. (2017). *China*. PollingReport.com. <https://www.pollingreport.com/china.htm>
- Coers, N., Rodriguez, M. T., Roberts, G. T., Emerson, H. C., & Barrick, R. K. (2012). Examining the student impacts of three international capstone experiences. *NACTA Journal*, 56(2), 55-62. <https://www.jstor.org/stable/pdf/nactajournal.56.2.55.pdf>
- Connors, J. (2004). FFA Costa Rican travel seminar participants’ international agriculture knowledge and perceptions. *Journal of International Agricultural and Extension Education*, 11(1), 71-79. DOI: 10.5191/jiaee.2004.11108

- Davis, J. A. (1971). *Elementary survey analysis*. Englewood Cliffs, NJ: Prentice–Hall.
- Dezember, R. & Maltais, K. (2020, November 17). Prices climb for soybeans, corn, wheat. *The Wall Street Journal*, pp. B6.
- Field, A. (2000). *Discovering statistics using SPSS for Windows: Advanced techniques for the beginner*. London: Sage.
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. (2019). *How to design and evaluate research in education* (10th ed.). Boston: McGraw-Hill Professional Publishing.
- Friedhoff, K., & Kafura, C. (2018, October). *China not yet seen as a threat by the American public*. The Chicago Council on Global Affairs. <https://www.thechicagocouncil.org/publication/lcc/china-not-yet-seen-threat-american-public>
- Frisbie, D. A. (1988). Reliability of scores from teacher-made tests. *Educational Measurement: Issues and Practice*, 7(1), 25-35. doi:10.1111/j.1745-3992.1988.tb00422.x
- Funk, C., & Kennedy, B. (2016). *The new food fights: U.S. public divides over food science*. Pew Research Center. <https://www.pewresearch.org/science/2016/12/01/the-new-food-fights/>
- Funk, C., Hefferon, M., Kennedy, B., & Johnson, C. (2019). *Trust and mistrust in Americans' views of scientific experts*. Pew Research Center. https://www.newswise.com/pdf_docs/156460235934074_Embargoed%20REPORT%20trust%20scientists%207-30-19.pdf
- Hansen, J., Marchant, M. A., Tuan, F., & Somwaru, A. (2017). U.S. agricultural exports to China increased rapidly making China the number one market. *Choices*, 32(2), 1-6.
- Helm, B., Smeltz, D., & Hitch, A. (2019, October). *Record number of Americans say international trade is good for the US economy*. The Chicago Council on Global Affairs. <https://www.thechicagocouncil.org/research/public-opinion-survey/record-number-americans-say-international-trade-good-us-economy>
- Hingorjo, M. R., & Jaleel, F. (2012). Analysis of one-best MCQs: The difficulty index, discrimination index and distractor efficiency. *JPMA. The Journal of the Pakistan Medical Association*, 62(2), 142–147.
- Hook, J. (2018, January). Americans' satisfaction with economy reaches 17-year high, poll finds. *The Wall Street Journal/NBC News Poll*. <https://www.wsj.com/articles/the-wall-street-journalnbc-news-poll-1378786510>
- Kafura, C. (2019a, August). *Americans favor US-China trade war, split over tariffs*. The Chicago Council on Global Affairs. <https://www.thechicagocouncil.org/publication/lcc/americans-favor-us-china-trade-split-over-tariffs>
- Kafura, C. (2019b, June). *Public and opinion leaders' views on US-China trade war*. The Chicago Council on Global Affairs. <https://www.thechicagocouncil.org/publication/lcc/public-and-opinion-leaders-views-us-china-trade-war>
- Khamis, H. (2008). Measures of Association: How to Choose? *Journal of Diagnostic Medical Sonography*, 24(3), 155–162. <https://doi.org/10.1177/8756479308317006>
- Krause, N. M., Brossard, D., Scheufele, D. A., Xenos, M. A., & Franke, K. (2019). Trends—Americans' trust in science and scientists. *Public Opinion Quarterly*, 83(4), 817–836. <https://doi.org/10.1093/poq/nfz041>
- Lai, E. L.-C. (2019). The US–China trade war, the American public opinions and its effects on China. *Economic and Political Studies*, 7(2), 169-184. <https://doi.org/10.1080/20954816.2019.1595330>

- Li, M., Zhang, W., & Hart, C. E. (2018, April). *Key agricultural products in U.S.-China trade disputes: the proportional, the significant, and the substitutable*. Ag Decision Maker, Iowa State University Extension and Outreach, Department of Economics. <https://www.extension.iastate.edu/agdm/articles/others/LiApr18.html>
- Marchant, M. A., & Wang, H. H. (2018). Theme overview: U.S.–China trade dispute and potential impacts on agriculture. *Choices*, 33(2), 1-3.
- Mason, S. C., Eskridge, K. M., Kliwer, B., Bonifas, G., Deprez, J., Medinger Pallas, C., & Meyer, M. (1994). A survey: Student interest and knowledge of international agriculture. *NACTA Journal*, 38(2), 34-38.
- Mildner, S. A., & Schmucker, C. (2019). The battle of the giants: US trade policy vis-à-vis China. *CESifo Forum*, 20(1), 3-10. <https://www.econstor.eu/bitstream/10419/199022/1/CESifo-Forum-2019-1-p03-10.pdf>
- Moore, E. A., Ingram, P. D., & Dhital, P. (1996). College of agriculture and non-college of agriculture students' knowledge about international agriculture and related factors. *Journal of Agricultural Education*, 37(4), 14-22. doi:10.5032/jae.1996.04014
- Morales et al. (2017). United States and Latin American undergraduate students' knowledge, attitudes and perception of global agricultural issues. *Journal of International Agricultural and Extension Education*, 24(2), 78-92. doi:10.5191/jiaee.2017.24206
- Musa, A, Shaheen, S., Elmardi, A., & Ahmed, A. (2018). Item difficulty & item discrimination as quality indicators of physiology MCQ examinations at the Faculty of Medicine Khartoum University. *Khartoum Medical Journal*, 11(2), 1477–1486.
- Newman, J. (2021, March 11). American farm exports to China surge. *The Wall Street Journal*, pp. A7.
- Pande, S. S., Pande, S. R., Parate, V. R., Nikam, A. P. & Agrekar, S. H. (2013). Correlation between difficulty & discrimination indices of MCQs in formative exam in Physiology. *South-East Asian Journal of Medical Education*, 7(1), 45-50.
- Qu, S., Zhang, W., Li, M., Rodriguez, L., Han, G., Cork, E., & Gbeda, J. M. (2019). *Midwest crop farmers' perceptions of the U.S.-China trade war*. Center for Agricultural and Rural Development, 578 Heady Hall, Iowa State University, Ames, Iowa 50011-1070. <https://www.card.iastate.edu/products/publications/synopsis/?p=1294>
- Rea, L. M., & Parker, R. A. (1992). *Designing and conducting survey research*. San Francisco, CA: Jossey–Bass.
- Silver, L., Devlin, K., & Huang, C. (2019). *U.S. views of China turn sharply negative amid trade tensions*. Pew Research Center, Global Attitudes & Trends. <https://www.pewresearch.org/global/2019/08/13/u-s-views-of-china-turn-sharply-negative-amid-trade-tensions/>
- Taber, K. S. (2018). The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in Science Education*, 48(6), 1273-1296. <https://doi.org/10.1007/s11165-016-9602-2>
- Torry, H. (2020, February 6). Trade deficit narrows for first time since '13. *The Wall Street Journal*, pp. A1-A2.
- Ursachi, G., Horodnic, I. A., & Zait, A. (2015). How reliable are measurement scales? External factors with indirect influence on reliability estimators. *Procedia Economics and Finance* 20, 679-686. [https://doi.org/10.1016/S2212-5671\(15\)00123-9](https://doi.org/10.1016/S2212-5671(15)00123-9)
- Wike, R., & Devlin, K. (2018). *As trade tensions rise, fewer Americans see China favorably*. Pew Research Center, Global Attitudes & Trends. <https://www.pewresearch.org/global/2018/08/28/as-trade-tensions-rise-fewer-americans-see-china-favorably/>

- Willnat, L., & Metzgar, E. T. (2012). American perceptions of China and the Chinese: Do the media matter? Paper presented at the 65th Annual Meeting of the World Association for Public Opinion Research, Hong Kong.
- Author et al. (2003). Students' knowledge and attitudes about international agricultural issues. *Journal of International Agricultural and Extension Education*, 10(3), 25-35. DOI: 10.5191/jiaee.2003.10304
- Author et al. (2006). Barriers to international experiential participation. *Journal of International Agricultural and Extension Education*, 13(3), 79-89.
- Wunderlich, S., & Gatto, K. A. (2015). Consumer perception of genetically modified organisms and sources of information. *Advances in Nutrition*, 6(6), 842-851, <https://doi.org/10.3945/an.115.008870>
- Zhang, W. (2015, November). *How different is Chinese agriculture from the United States?* Ag Decision Maker, Iowa State University Extension and Outreach, Department of Economics. <https://www.extension.iastate.edu/agdm/articles/zhang/ZhaNov15.html>
- Zhang, W. (2019, February). *Seven things to know about China to understand the trade war.* Ag Decision Maker, Iowa State University Extension and Outreach, Department of Economics. <https://www.extension.iastate.edu/agdm/articles/zhang/ZhaFeb19.html>
- Zhang, W., & Li, M. (2018, February). *Navigating the Chinese agricultural economy through the lens of Iowa.* Ag Decision Maker, Iowa State University Extension and Outreach, Department of Economics. <https://www.extension.iastate.edu/agdm/articles/zhang/ZhaFeb18.html>
- Zhu, H., Jackson, P., & Wang, W. (2017). Consumer anxieties about food grain safety in China. *Food Control*, 73, 1256-1264.
- Zitner, A. (2018, December). *Americans have mixed feelings about economy, Trump Presidency.* The Wall Street Journal/NBC News Poll. <https://www.wsj.com/articles/the-wall-street-journalnbc-news-poll-1378786510>
- Zumbrun, J. (2020, June 15). China regains top spot in trade with U.S. *The Wall Street Journal*, pp. A1-A2.

APPENDIX

Table 1. Demographic Profiles (N = 436).

Variables	Categories	Students (n = 131)		Public (n = 305)		Total (N = 436)	
		f	%	f	%	f	%
States ^a	Kansas	35	26.7	30	9.8	65	14.9
	Wisconsin	26	19.8	33	10.8	59	13.5
	Iowa	25	19.1	30	9.8	55	12.6
	Minnesota	10	7.6	32	10.5	42	9.6
	Illinois	10	7.6	31	10.2	41	9.4
	Indiana	9	6.9	31	10.2	40	9.2
	North Dakota	8	6.1	28	9.2	36	8.3
	Missouri	4	3.1	30	9.8	34	7.8
	Nebraska	2	1.5	30	9.8	32	7.3
	Ohio	2	1.5	30	9.8	32	7.3
Race ^b	White	115	87.8	269	88.2	384	88.1
	Black			19	6.2	19	4.4
	Asian	7	5.3	11	3.6	18	4.1
Sex	Female	58	44.3	193	63.3	251	57.6
	Male	72	55.0	109	35.7	181	41.5
Age groups	18-24	131	100.0	21	6.9	152	34.9
	25-34			35	11.5	35	8.0
	35-44			47	15.4	47	10.8
	45-54			40	13.1	40	9.2
	55-64			72	23.6	72	16.5
	65-74+			84	27.6	84	19.3
Residence	Urban Cluster (2.5K-50K)	49	37.4	105	34.4	154	35.3
	Urban Area (>50K)	24	18.3	127	41.6	151	34.6
	Rural (all non-urban)	58	44.3	73	23.9	131	30.0
Employment status	Student	131	100.0	17	5.6	148	33.9
	Employed full time			118	38.7	118	27.1
	Retired			84	27.5	84	19.3
	Employed part time			41	13.4	41	9.4
	Unemployed, not looking ^c			28	9.2	28	6.4
	Unemployed, looking			14	4.6	14	3.2
Political affiliation	Republican	63	48.1	97	31.8	160	36.7
	Democrat	20	15.3	109	35.7	129	29.6
	Independent	33	25.2	89	29.2	122	28.0
	Other	15	11.5	10	3.3	25	5.7
Family is actively engaged in agriculture?	No	40	30.5	271	88.9	311	71.3
	Yes	91	69.5	30	9.8	121	27.8

Note. Percentages may not equal 100 because of missing responses. ^a Michigan and South Dakota were excluded from the quota sample because no responses were produced in the college student sample. ^b Included Native Hawaiian and Other Pacific Islander, and Two or More Races. ^c Respondents may not have been looking for work due to the COVID-19 pandemic at the time of data collection (May 2020).

Table 2. Perceptions of U.S.-China Agricultural Trade Issues (N = 436).

Statements	Students (n = 131)		Public (n = 305)		Total (N = 436)	
	M*	SD	M*	SD	M*	SD
American consumers bear the cost of tariffs imposed on Chinese products by the U.S. government	3.45	.95	3.85	1.02	3.73	1.01
American farmers will bear the burden of the tariffs imposed by the Chinese government	3.83	.90	3.65	1.14	3.70	1.08
U.S. and Chinese tariffs imposed on each other's products will have long term negative effects on U.S. agriculture	3.41	1.02	3.54	1.14	3.50	1.11
The trade dispute will make U.S. agriculture lose markets to other competitors	3.34	1.00	3.32	1.19	3.32	1.13
The U.S. economy will suffer more than China's economy because of the trade dispute	3.17	1.05	3.26	1.28	3.23	1.22
U.S. agriculture will become more competitive globally because of the U.S.-China trade dispute ^a	3.22	1.01	3.19	1.21	3.20	1.15
Nothing good will come of the U.S.-China trade dispute	2.84	1.04	3.22	1.21	3.11	1.17
U.S. and Chinese tariffs imposed on each other's products will have long term positive effects on U.S. agriculture ^a	2.84	1.04	3.22	1.21	3.11	1.17
President Trump is mostly to blame for the U.S.-China trade dispute	2.75	1.23	3.26	1.48	3.10	1.43
China is mostly to blame for the U.S.-China trade dispute ^a	2.93	1.04	3.15	1.22	3.09	1.17
The trade dispute will enhance long term economic relationships between the U.S. and China ^a	2.94	1.01	2.99	1.28	2.97	1.20
U.S. Congress is mostly to blame for the U.S.-China trade dispute	2.82	.88	2.85	1.14	2.84	1.07

Note. *Means ranged from Strongly Disagree (1.00-1.50) to Strongly Agree (4.51-5.00) on a 5-point Likert-type scale. ^aItem was reverse-coded for reliability tests and calculating the perceptions of U.S.-China agricultural trade issues score (i.e., summed scale score).

Table 3. Frequency Distributions for Perceptions of U.S.-China Trade Issues (N = 436).

Statements	Students (n = 131)		Public (n = 305)		Total (N = 436)	
	f	%	f	%	f	%
Raising tariffs and barriers on imports from other countries will...						
Do more to raise the costs of consumer goods and hurt the U.S. economy	69	52.7	157	51.5	226	51.8
Do more to protect American jobs and help the U.S. economy	43	32.8	115	37.7	158	36.2
Not have much impact on the U.S. economy	3	2.3	13	4.3	16	3.7
Not sure	16	12.2	20	6.6	36	8.3
President Trump imposed tariffs which make some foreign products sold in the U.S. more expensive. Do you...						
Oppose his actions because they hurt the average American	57	43.5	160	52.5	217	49.8
Support his actions because they help the average American	48	36.6	116	38.0	164	37.6
Think his actions don't have an impact	3	2.3	13	4.3	16	3.7
Not sure	23	17.6	14	4.6	37	8.5
What is your opinion of President Trump's handling of the U.S. economy?						
Approve	73	55.7	132	43.3	205	47.0
Disapprove	37	28.2	150	49.2	187	42.9
No opinion / Not sure	21	16.1	23	7.5	44	10.1
What is your opinion of President Trump's handling of U.S.-China trade?						
Disapprove	48	36.6	151	49.5	199	45.6
Approve	47	35.9	119	39.0	166	38.1
No opinion / Not sure	36	27.5	34	11.2	70	16.1
Do you favor or oppose trade with China?						
Favor	102	77.9	181	59.3	283	64.9
Oppose	12	9.2	73	23.9	85	19.5
Not sure	17	13.0	50	16.4	67	15.4
Does trade between the U.S. and China do more to strengthen or weaken U.S. national security?						
More to strengthen U.S. national security	52	39.7	114	37.4	166	38.1
Not sure	48	36.6	93	30.5	141	32.3
More to weaken U.S. national security	31	23.7	98	32.1	129	29.6
Which country is a stronger economic power? ^a						
United States	43	32.8	130	42.6	173	39.7
About equal economic power	53	40.5	84	27.5	137	31.4
China	35	26.7	91	29.8	126	28.9

Note. Percentages may not equal 100 because of missing data. ^aItem was deleted from reliability tests and calculations of perceptions of the U.S.-China trade issues score (i.e., summed scale score).

Table 4. Frequency Distributions for Correct Knowledge Responses ($N = 436$).

Questions	Students ($n = 131$)		Public ($n = 305$)		Total ($N = 436$)	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	% ^a
	China was the world's leading producer of [rice] in 2018	114	87.0	250	82.0	364
China's 1.4 billion population is more than [four] times larger than that of the United States	84	64.1	132	43.3	216	49.5
China relies on soybeans from the U.S. and [Brazil] to supply about 90% of its soybeans, mostly for feed	89	67.9	117	38.4	206	47.2
The total value of imports of goods and services into China from the U.S. in 2016 was about [\$200 billion]	55	42.0	147	48.2	202	46.3
The total value of exports of goods and services from China to the U.S. in 2016 was about [\$500 billion]	48	36.6	141	46.2	189	43.3
About 2% of the U.S. population is engaged in agriculture, compared to more than [20%] in China	49	37.4	124	40.7	173	39.7
About [16] percent of the U.S. is arable land	50	38.2	112	36.7	162	37.2
The U.S. exports about [\$25 billion] worth of agricultural and related products to China every year	44	33.6	116	38.0	160	36.7
About [12] percent of China is arable land	49	37.4	100	32.8	149	34.2
[China] is the world's leading producer of pork	69	52.7	59	19.3	128	29.4 _c
In early 2020, the top U.S. trade partner was [Mexico]	38	29.0	56	18.4	94	21.6 _c
[Mexico] was the top foreign market for U.S. pork exports	25	19.1	61	20.0	86	19.7 _c

Note. Percentages do not equal 100 because of missing data. ^a Overall item difficulty. ^b Item was too easy ($P > 70\%$). ^c Item was too difficult ($P < 30\%$).

Table 5. Correlations between Knowledge and Perceptions of the U.S.-China Trade Dispute ($N = 436$).

Variables ^a	<i>n</i>	1	2
1. Knowledge ^b	436	—	
2. Perceptions of agricultural trade ^c	436	.02	—
3. Perceptions of trade issues ^d	436	.11*	-.20**

Note. Likert-type scales were summed to find respondents' overall perceptions of the U.S.-China agricultural trade dispute, and perceptions of trade issues. ^a Variables (interval level) were reported as Pearson correlation coefficients. ^b Knowledge ranged from 0-12 ($M = 4.88$, $SD = 2.18$). ^c Perceptions of agricultural trade ranged from 10-58 ($M = 35.76$, $SD = 9.03$). ^d Perceptions of trade issues ranged from 6-22 ($M = 16.36$, $SD = 3.20$).

* $p < .05$. ** $p < .01$.



Table 6. Correlations between Knowledge and Perceptions of the U.S.-China Trade Dispute and Selected Demographics (N = 436).

Variables	n	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Knowledge ^a	436	—												
2. Agri. Trade ^a	436	.02	—											
3. Trade ^a	436	.11*	-.20**	—										
4. Sex ^b	432	-.07	.09	-.19**	—									
5. Age ^c	431	.22	.16	.26	.10*	—								
6. Employment ^d	434	.14**	-.07	-.05	.10*	.06	—							
7. Agri. Family ^b	431	.08	-.08	.14**	-.16**	-.49**	.13**	—						
8. Republican ^b	436	.02	-.38**	.28**	-.14**	-.05	.07	.21**	—					
9. Democrat ^b	436	-.05	.40**	-.15**	.15**	.10*	-.07	-.22**	-.49**	—				
10. Independent ^b	436	.01	.00	-.10*	.00	.01	-.06	-.04	-.47**	-.40**	—			
11. Other Party ^b	436	.05	.00	-.10*	-.01	-.13**	.09	.09	-.19**	-.16**	-.15**	—		
12. City ^b	436	-.06	.15**	-.04	-.07	.14**	-.17**	-.28**	-.15**	.14**	.06	-.08	—	
13. Suburban ^b	436	-.04	-.02	-.04	.05	-.05	.02	-.07	.08	-.01	-.09	.00	-.54**	—
14. Rural ^b	436	.10*	-.14**	.08	.02	-.10*	.15**	.36**	.07	-.14**	.03	.08	-.48**	-.48**

Note. Likert-type scales were summed to find respondents' overall perceptions of the U.S.-China agricultural trade dispute, and perceptions of trade issues. ^a Continuous (interval) variables were reported as Pearson correlation coefficients (*r*). ^b Nominal (dichotomous) variables were reported as point-biserial correlations (*r*_{pb}). ^c Ordinal variables (age groups) were reported as Spearman rho correlation coefficients (*r*_s). ^d Multi-categorical (nominal, employment status) variables were reported as Cramer's V correlation coefficients. **p* < .05. ***p* < .01.