

## SOCIAL COGNITIVE FACTORS INFLUENCING FOOD SAFETY BEHAVIORS IN INDEPENDENT CHINESE AND MEXICAN RESTAURANTS IN KANSAS

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### ABSTRACT

Chinese and Mexican restaurants are among the most popular ethnic operations in the United States. Several studies have noted that more critical food safety violations occur in independent ethnic restaurants than in chain ethnic restaurants. This study explored the social cognitive factors that influence food safety behaviors of food handlers in independent Chinese and Mexican restaurants. One focus group interview and four group interviews, ranging from two to three participants, were conducted. A total of 17 food handlers from independent Mexican and Chinese restaurants in Kansas participated. All interviews were audio-recorded, transcribed, and coded by the main researcher using a thematic codes list. The thematic codes were then compared with the codes generated by another experienced researcher to ensure reliability and inter-coder agreement. The data was analyzed using NVivo 12 Plus for Windows. Nine main themes emerged from the data including self-efficacy, self-regulation, environmental factors, and outcome expectations. Other themes that emerged based on the most frequent statements included cultural background, attitude, and food safety knowledge, respectively. The findings support that the level of food handlers' self-efficacy, self-regulation, physical work conditions and social support, and expectations of the benefits of proper behaviors are integral in influencing food safety behaviors. Operators of independent Chinese and Mexican restaurants and foodservice educators, and policy makers may use these findings when conducting food safety training for food handlers.

**Keywords:** Food safety behavior, behavioral expectations, food safety attitudes, behavioral conformity

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### INTRODUCTION

The demand for ethnic food has grown worldwide in response to the influence of media exposure and travel-related food and cultural experiences (Clemes, Gan, & Sriwongrat, 2013). Ethnic restaurants, especially Chinese, Italian, and Mexican have gained popularity and have become mainstream in the diet of most Americans (Agarwal & Dahm, 2015; Lee, Niode, Simonne, & Bruhn, 2012; Liu & Jang, 2009). Despite the rapid growth in ethnic foods and the popularity of ethnic restaurants, several researchers have noted that ethnic restaurants have been associated with foodborne outbreaks (Kwon, Roberts, Shanklin, Liu, & Yen, 2010; Lee, Hwang, & Mustapha, 2014; Liu & Lee, 2017).

In a study designed to explore restaurant traits linked to foodborne outbreaks, ethnic restaurants were found to be more likely to have outbreaks due to complex food preparation methods used (CDC,

2011). A substantial body of research has illustrated that more critical food safety violations occur in independent ethnic restaurants than in chain ethnic restaurants (Kwon et al., 2010; Liu & Lee, 2017; Murphy, DiPietro, Kock, & Lee, 2011).

Kwon et al. (2010) compared critical and non-critical food safety violations between 500 independent ethnic and non-ethnic restaurants in 14 Kansas counties. They found that independent ethnic restaurants had a significantly higher number of critical food safety violations than independent non-ethnic restaurants.

Liu and Lee (2017) compared differences in food code violations between ethnic and non-ethnic restaurants, as well as independent and chain restaurants, using health inspection data from foodservice operations in Louisiana. The researchers found that ethnic restaurants have more violations than non-ethnic restaurants in categories related to time/temperature abuse, cross-contamination, food condition, food-contact surfaces, and food labeling; and chain restaurants had fewer violations than independent restaurants.

Most frequently reported food safety violations in independent ethnic restaurants were identified as poor time and temperature control, cross-contamination, inadequate hand hygiene, and lack of physical facility maintenance (Kwon, Choi, Liu, & Lee, 2012). The viability of an independent ethnic restaurant as a small business is challenged by its uniqueness as a family-owned ethnic group business (Jones & Fellers, 1999). Most ethnic restaurants are small-scale businesses with limited resources that can be used to improve food safety, especially in independent ethnic restaurants (Liu & Lee, 2017). Liu, Kwon, Shanklin, Canter, and Webb (2014) identified employees' fatigue, learning capability, and financial resources as the top three barriers that impede food safety training in Chinese restaurants. Food safety inspectors' lack of familiarity with the ethnic food (Mauer et al., 2006) and lack of food safety inspection guidelines that are specifically designed for ethnic restaurants (Liu & Lee, 2017) were other barriers to food safety improvement in independent ethnic restaurants.

Little research has been done to understand the social cognitive factors that may influence food safety behaviors, especially in independent ethnic restaurants. The Social Cognitive Theory (SCT; Bandura, 1986) has been used to explain a diverse set of health behaviors such as smoking cessation (Bektas, Ozturk, & Armstrong, 2010), reducing weight and increasing exercise (Haider, Sharma, & Bernard, 2012), and improving dietary habits (Ahlstrom, 2009; Gaines & Turner, 2009). The overarching concept of the SCT is reciprocal determinism, which means that a constant interaction exists among the characteristics of a person, their behaviors, and their environment (Gaines & Turner, 2009). The SCT seeks to provide a comprehensive understanding of both why and how people change their health behaviors and the social and physical environments that influence behavior change (McAlister, Perry, & Parcel, 2008). Although it

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recognizes how environments shape a behavior, this theory focuses on individuals' potential abilities to modify and construct environments to fit specific purposes they set for themselves (McAlister et al., 2008).

The purpose of this study was to explore the social cognitive factors that influence food safety behaviors of food handlers in independent Chinese and Mexican restaurants. A specific objective of the study was to utilize the most frequently discussed thematic items identified to generate an item pool for the measurement scales in a survey instrument that was used in the next phase of the study. The developed scales were then used to measure the four constructs of the Social Cognitive Theory (self-efficacy, self-regulation, outcome expectations, and environmental determinants), food safety behavioral intentions, and self-reported food safety behaviors.

## METHODS

Krueger and Casey (2000) and Morgan (1997) recommended that the ideal focus group would have six to eight participants, but not more than 10. For this study, one focus group interview and four group interviews ranging from two to three participants were conducted with a total of 17 food handlers from independent Mexican and Chinese restaurants. The group interviews were conducted in place of typical focus group interviews due to the difficulty researchers had in getting enough employees to gather at the same time for the focus group. Approval from the University's Institutional Review Board (IRB) where the study was conducted, was received prior to contacting potential participants.

### Sample and data collection

A convenience sample of independent Mexican and Chinese restaurants owners/managers ( $n = 30$ ) were contacted to request their permission to recruit participants from their operations. After obtaining the owners' or managers' approval, a flyer containing information about the study and a sign-up sheet were delivered to the restaurants in person. To ensure consistency, participants were randomly chosen based on two selection criteria. First, participants should be at least 18 years of age at the time of recruitment. Second, participants needed to be a food handler in a non-supervisory job. A total of 17 food handlers representing eight restaurants agreed to participate in the focus group and group interviews.

All interviews were held in a location deemed convenient for participants and away from their work site. Due to time limitations, two groups chose to be interviewed at their work site. Each interview lasted on average about one hour with the shortest lasting only 45 minutes and the longest lasting almost 2 hours. Each participant was provided a consent form to sign and received \$20 as a token of appreciation for their participation.

### Interview guide

The interview guide is provided in the appendix. The interview questions explored the social cognitive elements that may influence the participants' food safety behaviors. All interviews followed a questioning route with sequenced open-ended questions and other probe questions as needed. As described by Krueger and Casey (2000), the opening, introductory, and transition questions were meant to have the participants talk and think about the topic. The key and ending questions were more specific and focused to yield the most useful information.

The questioning route was prepared based on previous research (Abbot, Byrd-Bredbenner, Schaffner, Bruhn, & Blalock, 2009; Bearth, Cousin, & Siegrist 2014; Clayton, Griffith, Price, & Peters, 2002;

Howells et al., 2008; Meysenburg, Albrecht, Litchfield, & Ritter-Gooder, 2014; Pilling, Brannon, Shanklin, Howells, & Roberts, 2008; York, Brannon, Roberts, Shanklin, & Howells, 2009). A demographic and operational information questionnaire was completed by participants at the end of each session. Each guide was developed in English and translated to each language.

### Data analysis

The interviews were conducted in the spoken language of participants. Three interviews were conducted in Spanish and two interviews were conducted in English. The focus group and group interviews were audio-recorded, transcribed, and coded by the main researcher using a thematic codes list including both pre-established and free codes. Non-English interviews were translated into English by a bilingual researcher with experience in qualitative studies. To ensure reliability and inter-coder agreement, an experienced researcher was asked to independently transcribe and code the recordings (Creswell, 2009). Coding themes were then examined, and any disagreement was resolved. The coded data was analyzed using the procedures of NVivo 12 Plus for Windows (Version 12; QSR International Pty Ltd., 2017) to identify themes and patterns. Multiple procedures were implemented to ensure validity in terms of the accuracy and credibility of the results. Using different data sources from participants in different restaurants enabled triangulation to improve the dependability of the data. In addition, a peer debriefing procedure having an experienced researcher review the focus group and group interviews and ask questions about the procedures as recommended by Creswell (2009) added to the validity of the results.

## RESULTS AND DISCUSSION

### Demographic and Operational Characteristics

Demographics of participants and their operational characteristics are presented in Table 1. The majority ( $n = 11$ ) of participants were female and 11 participants were Hispanic, while six participants were Chinese. Participants were well-diversified regarding educational level. Only three participants indicated they had previous food safety training and one participant indicated they had a food safety certification. All operations were independent Mexican ( $n = 3$ ) or Chinese restaurants ( $n = 5$ ).

### Identified Themes and Sub-Themes

Analysis of the focus group and group interviews responses showed nine main themes across all responses. The themes were identified based on the frequency of statements mentioned by the participants. The themes and sub-themes are summarized in Table 2.

**Theme 1** represented self-efficacy. Self-efficacy represents the confidence in one's ability to perform a behavior. Participants in both the focus group and group interviews talked about their confidence to perform hand washing, handling practices of food and contact surfaces, and use of a thermometer. The statements mentioned were in response to a question asking about the extent of their confidence and ability to perform these three behaviors. The participants expressed their confidence by statements like, "*I am confident I do it every time before I serve*" and "*constantly, I already have fifteen years of work in a restaurant and I have to wash my hands.*" One participant also addressed the importance of the ability and willingness to perform food safety practices saying, "*but for me the main thing is the ability and the intelligence and the will.*" Another participant emphasized his or her confidence to perform hand washing as a basic rule, "*I am very confident. It is a very basic rule that everyone follows here even when it is a busy time*". These responses suggested that a food handler with high self-efficacy will more likely engage in proper food safety practices than someone with low self-efficacy. Previous

research has also indicated that self-efficacy is one of the important influencers of food safety behaviors (Beavers, Murphy, & Richards, 2015; Quick, Byrd-Bredbenner, & Corda, 2013).

**Theme 2** encompassed self-regulation that means controlling oneself through self-monitoring, goal setting, and processing information to achieve a goal (Bandura, 1991). This theme incorporated four sub-themes including habit, goals setting, self-monitoring, and self-regulated learning strategies. Participants emphasized the role of habit in shaping their behavior. In response to the intention to perform hand washing, one participant mentioned that *“I can tell you that I always do it because it is a habit.”* Another participant expressed the role of habit in guiding their hand washing behavior saying, *“I think most of the time I just follow what I did yesterday and the day before that.”* Another participant also addressed the power of habit saying, *“the habit makes you something mechanical [perform it automatically], something that you do not even think about or plan because you already know what you are going to do every day”.*

Having a goal in mind when performing food safety behaviors was apparent from the discussion of participants. One participant referring to another participant from the same restaurant stated that, *“he does not do it because he has to do it, but because we have in mind that I have to, I have to wash my hands, it’s not in our mind, in a hemisphere of our brain.”* Another participant stated that finishing a task within a certain time was another goal, *“sometimes we set the goal by making sure it [the food] is handled within certain time”.* Another participant from another group also said that *“the goal is my preparation list that I have to finish.”* Other goals related to finishing a task or serving foods that appeal to customers were reported. One participant mentioned, *“I try to make sure that all the food is hot and arrived warm to the client, that’s the goal.”* Similarly, another participant stated, *“the goal is for everything to be tasty, for it to come out good”.* Regarding the sub-theme of self-monitoring, some participants indicated that they self-monitor their food safety practices. One participant said, *“I remind myself that we did not have to leave meat more than 15 minutes outside.”* Another participant also stated that *“it is practiced every day because for example, she [a coworker] checks on me and I check what she is doing because I understand we are seeing each other.”*

The way by which participants learned self-regulation was another sub-theme that emerged. One participant mentioned that *“... I grabbed a book and it was where I learned, because there are all those rules [in that book].”* Another participant highlighted the role of experience in developing self-regulation strategies saying, *“the interest to do it and the experience that we have been acquiring through the years. Every day we learn something new that we have very present.”* These findings are in line with Hall and Fong (2007) who argued that repetitive health behaviors, which are easy to self-control, are a function of both past behaviors represented in habits and self-regulation.

**Theme 3** represented environmental factors that may influence food safety behavior. One participant highlighted the role of work conditions in their restaurant as a constraint to properly follow hand washing behavior saying, *“in practice it is 5% that follows it, because there is neither time nor the conditions are the most adequate to wash hands.”* Similarly, another participant expressed their concern about having to use disinfectants which are irritating to their skin, stating *“the condition must be expressed [expressing concerns about work conditions] to the employer so that the employer puts in whatever is necessary for person to work.... The employer can put another disinfectant that is not harmful to their [the food worker’s] skin.”*

**Table 1. Focus Group and Group Interviews: Demographic and Operational Characteristics**

Characteristic	Frequency
<b>Age Group</b>	
18-25 years	3
26-33 years	3
34-41 years	5
42-49 years	3
50 years and older	3
<b>Gender</b>	
Female	11
Male	6
<b>Ethnicity</b>	
Hispanic or Latino	11
Asian	6
<b>Education</b>	
less than high school	2
High school/GED	6
Associate degree	2
Some college	2
Bachelor's degree	3
Graduate degree	2
<b>Position</b>	
Prep cook	8
Line cook	6
Other	2
Executive chef	1
<b>Years of Experience</b>	
5 years or less	13
6-15 years	3
16-25 years	1
<b>Type of Service</b>	
Casual dining	11
Quick service (Fast food)	5
Quick casual	1
<b>Food Safety Training</b>	
No	14
Yes	3
<b>Food Safety Certification</b>	
No	16
Yes	1

Two participants mentioned that the availability of necessary supplies and tools is important to facilitate their food safety behavior. They said, *“soap, disinfectant, thermometers, gloves. Everything we need to do things.”* And *“we have the sink to wash our hands. We have everything we need. And you have it at hand in front of you, so you do not forget.”* The role of social support by managers or supervisors in influencing food safety behavior is apparent. One participant said, *“I think the manager, or the supervisor has to set a good model in every good manufacturing practice. They have to do this on themselves and then they will monitor others and give them rewards or punishment if needed.”* Previous research also provided a consistent evidence of the importance of the adequacy of necessary equipment and access to supplies to perform proper food safety behaviors (Strohbehn et al., 2014; York et al., 2009).

The role of time constraints in following food safety behaviors properly stood out from the discussion of one group of participants. One participant said, *“sometimes circumstances do not give [allow] you to follow the procedures of how food should be handled and how areas should be disinfected. Because it is so much the number of people and it gets so busy that it does not give [allow] you time for*

**Table 2. Identified Themes and Sub-Themes**

Theme	Frequency
<b>Self-Efficacy</b>	14
<b>Self-Regulation</b>	
Habit	26
Goals setting	17
Self-monitoring	7
Self-regulation learning strategies	7
<b>Environmental Factors</b>	
Physical environmental factors (equipment and resources)	18
Time constraints	17
Social environmental factors	12
Training and access to food safety information	4
Inspection by officials	3
<b>Outcome Expectations</b>	
Reducing risk of foodborne illnesses, avoiding lawsuits, and maintaining good reputation	46
Time constraints and cost of supplies	5
<b>Behavioral Intentions</b>	4
<b>Food safety Behaviors</b>	
Hand washing	22
Cleaning, sanitizing, and avoiding cross-contamination	22
Use of a thermometer	11
<b>Cultural Background</b>	33
<b>Attitude</b>	6
<b>Knowledge</b>	4

anything.” Another participant also mentioned, “then the procedure is lost because there is not enough time or the necessary personnel to do the work.”

Training and access to food safety information as an external influencer of the behavior was evident. One participant said, “I don’t think there is training here, that we as Hispanics are a lot of do this and do the other thing [lots of instructions that do not pertain to them], but in American restaurants we do not have it either, that information is not there at hand.” Another participant also said, “every worker before being a food server has to go through a series of training to make sure good practices are practiced.” Inspection by health authorities was another external influencer mentioned by some participants. One participant said, “the first most basic of a restaurant and for me is what the inspector says hot hot and cold cold [maintain the temperature of food]”. The participant continued and said in reference to cleaning and sanitizing work surfaces, “and we have to clean it as I say is not that one has invented it, is that the State inspection requires it.” Similarly, previous research indicated that inadequate resources or supplies, lack of training, lack of reminders, restaurant procedures, and time constraints are among the most frequently reported barriers to performing proper food safety practices (Green & Selman, 2005; Pilling et al., 2008; York et al., 2009).

**Theme 4** represented outcome expectations regarding the advantages and/or disadvantages of following food safety behaviors. Participants across all groups emphasized the advantages of following proper food safety behaviors. One participant said, “avoid lawsuits, diseases. Quality. So that the client is satisfied.” Another participant also mentioned, “so if you realize how important it is to follow the rules because you never know when you can infect someone”. Avoiding loss of job and closure was mentioned by a participant saying, “if someone got sick because of eating our food, we are going to lose our job, they are going to shut down, the inspection comes, and everybody will lose job.” Another participant also said, “have more people coming to eat with us because they see you [serving] very hygienic food and restaurant [clean restaurant]. The opinion of the

clients” On the other hand, participants did not associate following food safety practices as a disadvantage. One participant said, “it looks as disadvantage but compared to advantages it is nothing. You spend on food safety like hand wash soap, and hats. You have to spend cost on those kinds of things.” Another participant also mentioned, “there is no disadvantage, for me it is all an advantage to do things correctly.” Roseman and Kurzynske (2006) examined the relationship between food safety risk perception and adherence to proper food safety practices. Their findings suggested that outcome expectations regarding the beliefs and perception of potential risks of poor food handling behavior could stimulate following proper food safety behaviors. Liu et al. (2014) indicated that Chinese restaurateurs value face saving as a foundation of their culture and making them aware of the negative consequences of improper food safety behaviors will likely motivate them to provide food safety training to their employees.

**Theme 5** encompassed food safety behavioral intentions. Participants discussed their intention to carry out food safety behaviors and how it guides their behaviors. One participant expressed the importance of employees’ behavioral intention saying, “in many places, you have the rules that you have to follow, and it depends on them [a food worker] whether they want to do it or not, because they are told, you are going to do this and this, but it is already dependent on the person.” Another participant mentioned how his or her behavioral intention has decreased the longer he/she has been in the food service industry, stating, “I think my desire or my intention to follow this rule kind of decrease as the time increases working in this industry. So, after a long time maybe I get bored.” This response suggested that decreased behavioral intention over time may cause a food worker to be over-confident that they are likely to cut corners in performing recommended food safety behaviors. Previous research highlighted the importance of behavioral intention in influencing food safety behavior. Pilling et al. (2008) examined the influence of restaurant employees’ intentions on performing food safety behaviors and found a significant difference between employees’ level of intention and beliefs about food safety behaviors.

**Theme 6** represented three food safety behaviors, including hand washing, handling of food, cleaning and sanitizing work surfaces, and use of a thermometer. When asked about the frequency of practicing hand washing, participants reported several practices. One participant said, *"I sing a song like happy birthday when I wash my hands."* Another participant mentioned, *"every time you start the work you have to wash your hands."* Another participant also stated, *"once you are leaving the work area when you come back you have to wash your hands. I only wash my hands when I leave and come back to the work area."* And when asked about how they wash their hands, one participant said, *"the definition [of hand washing] would be something quick. Without brush."*

Participants mentioned several practices related to proper cleaning and sanitizing of food contact surfaces. For example, one participant talked about preventing cross-contamination saying, *"in the case of preparation, a different color is used, a different cutting board for vegetables and meats."* Similarly, another participant stated, *"I have to strictly separate the raw material from the cooked material."*

Cleaning of food contact surfaces was another practice mentioned by participants. For instance, one participant said, *"when we start, it's the first thing we do. Clean everything well with chlorine to disinfect well."* Although only a few participants reported often using a thermometer, they mentioned other practices to ensure food reached the desired temperature. For example, one participant said, *"we do not really measure the temperature of the food, but we make sure it is in a safe environment [condition]. For the hot food we make sure it is boiled or over a hundred."* When asked about when they use a thermometer, one participant stated, *"when I don't trust cooking to the right temperature."* Some participants mentioned the proper use of a thermometer. One participant said, *"well, you put it in the food to the bottom [the thickest part of the food] and there it will mark the degrees to which the food is at and whether it is hot, or it is cold."* Another participant mentioned, *"what I do, sometimes, is to put the thermometer inside the food to take the temperature."* Niode, Bruhn, and Simonne (2011) conducted interviews with 41 managers of Asian and Mexican restaurants in Northern California and found that approximately 10% of Mexican restaurants and 62% of Asian restaurants did not use food thermometers to check doneness. The researchers indicated that 47.6% of the participants from Asian restaurants who do not know the cooking temperature, use their traditional methods to check the doneness of food through appearance or seeing the food boiling. Similarly, Li (2015) found that food thermometers are used less by food handlers in independent Chinese restaurants and attributed that to lack of motivation, lack of risk perception, lack of time, or unavailability of food thermometers. Feng and Bruhn (2019) reviewed eighty-five studies about the knowledge, attitude, and behaviors related to thermometer use of consumers and food workers. They found that there were two major barriers to the use of thermometers including belief that a thermometer is not necessary and difficulty of selecting and using a thermometer.

**Theme 7** represented the cultural background of food handlers and its influence on their food safety behaviors. This theme dominated the discussion of a Chinese and a Mexican group. One participant said, *"as we come with a different culture and that influences the practices that I have."* Another participant stated, *"whenever they come to do the inspection, they ask questions that I seriously do not know how to answer because this the cooking method we use. Unless I did it this way, I have to take it from the menu."* Another participant also mentioned, *"one arrives in this country and begins to learn, but the culture that one brings is to the root because not all we do in the*

*restaurant is what they teach us [public health authorities]".* Understanding the cultural background of employees in ethnic restaurants and its influence on food handling practices is vital to fully appreciate the challenges to implementing proper food safety practices in these operations and develop food safety training programs that address potential cultural misconception of workers (Liu et al., 2014; Niode et al., Niode, Bruhn, & Simonne 2011).

**Theme 8** represented employees' attitude to food safety. When asked about what practices they perform to ensure food safety, one of the participants elaborated, *"first the attitude. After having the tools that we have, if we do not have the attitude we will not do it."* Another participant stated, *"many people do not have the responsibility to do things correctly and the attitude also falls".* Other participants also explained how they approach food safety, *"I have to prepare for that person, I have to prepare it as if it were for me...we sincerely like it, that's why we are both working together, we like it, and we do it well."* Howells et al. (2008) indicated that educating food handlers on the consequences of improper practices might improve their attitude towards food safety. Therefore, unless employees' expectations support that a specific food safety behavior makes a difference in the safety of the food served, their attitude and belief about the behavior will be negative (Ball, Wilcock, & Aung, 2010).

**Theme 9** represented food safety knowledge. Some participants indicated the importance of food safety knowledge. When asked about factors that make it easier to perform hand washing, one participant stated, *"but what makes it easier for you to do it is that you already know that if you do not do it the bacteria can come if you already know that bacteria can get there, you are like this you have to wash your hands."* Another participant mentioned, *"it is important because we know that if the hot food is not more than 135 degrees [fahrenheit] it begins to spoil."* Another participant emphasized the importance of improving food safety knowledge, *"Improvement for oneself for knowledge. If we ever get to another place [another operation], and they tell you to see how you do this, can you read the thermometer? It is to improve knowledge."* The importance of food safety knowledge and training has been highlighted in previous research. Osaili et al. (2013) evaluated food safety knowledge of food handlers in fast food restaurants and found that food workers who completed a food safety training course had higher overall food safety knowledge scores than those who did not complete it. Even though food safety knowledge is an essential component of promoting food safety behavior, numerous studies indicated that it is not always sufficient to translate to behavior change (Clayton et al., 2002; Green, 2008; Pilling et al., 2008; York et al., 2009).

The nine main themes that emerged from the data comprised all the social cognitive factors including self-efficacy, self-regulation, environmental factors, and outcome expectations. Other themes that emerged based on the most frequent statements included cultural background, attitude, and food safety knowledge respectively. The identified major subthemes included habits, physical environmental factors, and the advantages of performing proper food safety behaviors by reducing risk of foodborne illnesses, avoiding lawsuits, and maintaining good reputation.

## CONCLUSIONS

The purpose of this study was to explore the social cognitive factors that influence food safety behaviors of food handlers in independent Chinese and Mexican restaurants. The results of the focus group and group interviews highlighted several other factors along with the social cognitive factors that influence food safety behaviors in independent Chinese and Mexican restaurants. The findings of this

study can guide future studies to investigate and target food safety behavior interventions more effectively. The results showed the influence of cultural background on food safety behaviors. To support a positive organizational culture of food safety, public health officials should consider the influence of ethnic culture of employees in independent Chinese and Mexican restaurants when conducting food safety training for foodservice employees. The results also suggest that operators in independent Chinese and Mexican restaurants need to support food handlers' self-efficacy. Consistent encouragement of food handlers can reinforce confidence enough to bring about more efforts toward improving food safety behaviors.

The role of habit in informing food safety behaviors was evident from the results. Operators of independent Chinese and Mexican restaurants are recommended to motivate their food handlers to follow self-regulation strategies like monitoring their food safety practices, setting goals, and evaluating their performance to gain a sustained intention and habit to perform proper behaviors through time. The results support that the physical environment represented in access to resources and supplies and social support represented in motivation can positively influence food handlers' adherence to proper food safety behaviors.

The findings indicated that participants were aware of the negative outcomes of improper food safety practices. Therefore, operators of independent Chinese and Mexican restaurants should use persuasive messages with food handlers to improve their behaviors or continue to perform proper food safety behaviors to avoid potential negative ramifications. These messages can be expressed verbally or in writing in the spoken language of food handlers. Previous research established that food handlers do not always act on their food safety knowledge due to time pressure, lack of supplies, or not being aware of the critical nature of food safety behaviors. The findings of this study support that foodservice operators need to communicate messages of why, when, and how to perform certain behaviors to food handlers to promote their self-efficacy, outcome expectations, and overall compliance.

#### Limitations

To reduce researcher bias, the recordings were coded by two experienced researchers to validate data analysis and interpretation. The restaurants in this study were chosen because of the convenience of travel distance and therefore, selection bias is possible. The participants in this study may have provided socially desirable responses, because they might want to be perceived as adherent of best food safety practices and gave answers that reflect that perception. This was addressed in the interview guide by including and using probe questions to draw out additional information or clarify the responses.

#### Future Research

Future research is encouraged to explore social cognitive factors that may affect food safety behaviors in other independent ethnic restaurants. Future studies may use a qualitative approach to understand the role of habit in motivating food safety behaviors and factors that sustain good work habits.

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## APPENDIX

Type of question	Question
Opening	Can you tell me how long you have been working in your restaurant/foodservice industry?
Introductory	When you think of food safety behavior, what is the first thing that comes to your mind?
Transition	Think back to when you started your job as a food handler, what factors would you say influenced your food safety behavior?
Key questions	<p><b>Self-efficacy</b></p> <p>How confident are you about washing hands? <b>Probe:</b> Can you explain how to wash your hands properly?</p> <p>To what extent do you feel confident in your ability to clean and sanitize food contact surfaces? <b>Probe:</b> When should you clean and sanitize food contact surfaces?</p> <p>To what extent do you feel confident in your ability to use a food thermometer? <b>Probe:</b> How do you use the thermometer to check the temperature of the food?</p> <p><b>Self-regulation</b></p> <p>What goals do you have in mind when you prepare/cook the food? Do you self-monitor your food handling practices? <b>Probe:</b> How did you learn these self-regulation strategies?</p> <p><b>Outcome expectations</b></p> <p>What are some advantages related to performing proper hand washing/ using a thermometer/ proper handling of food and work surfaces? <b>Probe:</b> What are some reasons why you would want to carry out these food safety behaviors?</p> <p>What are some disadvantages related to performing hand washing/ using a thermometer/ proper handling of food and work surfaces? <b>Probe:</b> What are some reasons why you think there could be disadvantages from performing these food safety behaviors?</p> <p><b>Environmental determinants</b></p> <p>What factors in your workplace would make it easier for you to perform these behaviors? What factors in your workplace would make it difficult to perform these behaviors? <b>Probe:</b> Can you think about physical and/or social factors?</p> <p><b>Behavioral intention</b></p> <p>Can you tell me about your intentions to carry out hand washing/using a thermometer/proper handling of food and work surfaces in the past two weeks? <b>Probe:</b> If you intend to perform proper food safety behaviors, what would your plan look like?</p>
Transition	What practices do you perform to ensure safe handling or preparation of food?
Key question	<p><b>Food safety behavior</b></p> <p>When do you wash your hands in a typical work day? When do you use a thermometer? What practices do you perform to ensure proper handling of food and work surfaces?</p>
Ending question	Do you have anything else you would like to share that we haven't discussed?