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Restaurant Restrooms as They Relate to Kitchens: Customer Perceptions Vs. Inspection Scores

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ABSTRACT

The purpose of this paper is to determine whether there is a relationship between the cleanliness condition of a restaurant's restroom and that of its kitchen, and to determine what criteria are important to customers when assessing restroom cleanliness. Three sources of data were used; a public opinion survey was administered to determine criteria for cleanliness, audits were performed in restaurant restrooms, and Health Department inspection scores were collected. ANOVA and regression were used to determine if there was a relationship between restrooms and kitchens. There is no relationship between the cleanliness condition of a restaurant's restroom and that of its kitchen. Customers use different criteria than the Health Department when forming an opinion of the cleanliness of a public restroom. The study was performed in restaurants within the same county. The findings need to be confirmed by further evidence from other regions. Future research should investigate whether the cleanliness of a restaurant's restroom reflects management's attitude toward sanitation and food safety. Restaurateurs should understand how much restrooms matter to the public. They have great potential to contribute to loss of business and negative word-of-mouth publicity. Additionally, restaurateurs should know which areas of the restroom are most critical to the customer. This research adds new information to the body of literature and will assist managers by highlighting the bottom-line importance of the restroom, as well as by detailing the specific areas of most concern to customers.

Keywords
Cleanliness, Restroom, Restaurant, Sanitation, Customer opinion

INTRODUCTION

As the restaurant industry is struggling to recover from the damage caused by a global pandemic, it is important to ensure that the public feels safe to return to in-person dining. Consumers who choose to dine out put their safety in the hands of restaurateurs, and use a variety of cues to determine their level of comfort and safety of establishments.

Beyond reading local health inspections (if they are published in that area), there are not many ways for a consumer to know what the condition of the kitchen is like in any given establishment. The consumers

must rely on their own observations to form an opinion of the safety and cleanliness practices of a restaurant. The dining room, staff, and even the condition of the parking lot and entrance all can play important roles in the formation of their opinion (Bigger & Bigger, 2004).

According to many trade journals, one area of the establishment that is used by three-fourths of the dining public to assess the condition of the back of the house is the restroom (Klara, 2004a). If it is clean, well-stocked with supplies, free from odor and litter, and in a good state of repair, it can have a profoundly positive impact on what the customer believes the kitchen is like. Of course, if these conditions are not true, then it can have the opposite effect; the customer will leave with a poor opinion of what the back of the house is like. It is commonly assumed that an establishment's restroom is an accurate predictor for the condition of the kitchen (Amer, 2003: Blackiston & Evans, 2004; Bock, K., Bock, et al, 2003; Klara, 2004b).

Because of the consumer use of the restroom as a predictive tool for measuring the cleanliness of the kitchen, this research was conducted to determine what criteria the public uses when making a judgment as to whether a restroom is clean or not. These criteria were then used to measure restroom cleanliness. Additionally, this research was conducted to determine whether the commonly held assumption that the cleanliness of the restroom is an accurate indicator of the cleanliness of the kitchen is correct or not.

LITERATURE REVIEW

Surveys indicate that guests want to return to dine-in restaurants. Thirty-one percent of diners say they've already resumed their pre-pandemic dining behavior, and for those who haven't, 33% anticipate resuming their regular dining out behavior between April and September 2021, and 54% of respondents plan to dine out at a restaurant with table service at least once a week in 2021 (JBF/OT,2021). However safety is still crucial for diners, as "over 70% of diners say it's extremely or highly important for restaurants to require diners to follow safety precautions, have staff wear PPE, space tables more than six feet apart, or communicate strict cleaning policies." (JBF/OT, 2021) Additionally, "guests are very sensitive to hygiene and anything that even looks messy will translate to unclean in their minds, so everyone's uniforms, hair, nails, any surfaces guests can see, it all needs to be tidy and spotless, now more than ever." (Black sheep restaurant group, 2020)

"Restaurant cleanliness is one of the most important aspects when a customer evaluates restaurant quality and return intention. In particular, restaurant restroom cleanliness is often considered the central factor that leads to overall perception of cleanliness." (Kim & Bachman, 2019)The fact is that today's customers put cleanliness on par with quality, which makes this issue even more important and potentially damaging than ever (Bigger & Bigger, 2004). This belief is found to be held across many demographics (Aksoydan, 2007).

Trade journals and pop culture reinforce this assumption as well. Modern Restaurant Management states "They say you can tell a lot about a restaurant from its facilities: bathrooms set the standard for how consumers view the cleanliness of the restaurant."(Modern Restaurant Management, 2021) Consider that "78% of people surveyed feel that a clean restroom is a strong indicator of a clean kitchen. In fact, the more upscale the restaurant, the stronger the belief" (Blackiston & Evans, 2004). The feeling seems to be that with fast-food restaurants, the idea is to get in and out as quickly as possible, whereas in a fine dining establishment one lingers as part of the pampering of an upscale experience.

"A restroom says a lot about the restaurant. It's a key component of the operation, and it says as much about the kitchen as it does about anything else" (Prewitt, 2001). If a restroom is filthy, what is the off-limits kitchen like? How the management keeps the restroom up might be an indication of the amount of

pride that is taken in preparing the food (Ruggless, 2001). Anthony Bourdain agreed, when he said "I won't eat in a restaurant with filthy bathrooms. This isn't a hard call (Bourdain, 2000)."

While 75% of customers said that they "would not return to an establishment if the restrooms were not well kept" (Klara, 2004b), 74% said that they would actually leave a fast-food establishment if it appeared dirty (Amer, 2003). Combine this with the findings that up to 78% of consumers consider a dirty restroom indicative of the overall level of cleanliness in the restaurant, "and the message is clear: customers may never visit your kitchen, but once they've left the restroom, they might as well have" (Klara, 2004b).

This level of concern is not unique to restaurants, but to many areas within the hospitality industry. Hotels, too, should understand the factors that influence the selection of accommodations, and, like many restaurants, there has been research which suggests that cleanliness is the most important factor (Lockyer, 2003). According to Caterer and Hotelkeeper "bathrooms can make or break your hotel's reputation. [Guests] judge the cleanliness of the room and the entire hotel by the cleanliness of the bathroom" (Caterer & Hotelkeeper, 2003).

Given the importance placed on the restroom by the customer, it is necessary to assess how a consumer determines cleanliness of a restroom. The Department of Health has a standard of what is and is not clean, but their standard may not necessarily match what the public considers important factors when judging a restroom's condition. For example, a health department inspector will check for smooth, non-porous, and easily cleanable walls. This may not matter to the general public, who might be more concerned with a wet toilet seat or a foul odor, which are not violations of the code requirements of the department of health. The perception a consumer has when visiting a restaurant's facilities compared to that of a health department inspector, trained to look for very specific requirements, may not be similar.

This study, performed in Indiana, assessed customer perceptions of restroom cleanliness. In addition, this study evaluated the accuracy of the customers' perception that cleanliness of the restroom is an indicator of kitchen cleanliness by comparing detailed restroom cleanliness audits to overall restaurant health inspection scores.

This study assessed the importance to consumers of maintaining a clean restroom, developed a tool to assess what the public considers important in public restroom cleanliness, and developed a tool to assess the cleanliness of a restroom. In doing so, this research attempted to answer the following questions:

1. Is the public's concern with food safety related to their concern with cleanliness of restrooms?
2. Does the condition of an establishment's restroom have an impact on the customers' restaurant decision-making behavior?
3. What specific aspects of restroom cleanliness are most important to customers?
4. Is there a relationship between restroom cleanliness and health inspection scores?
5. Do variables such as age, gender, education, and knowledge of health inspection scores have an impact on the customers' perception of restroom cleanliness?

METHODOLOGY

Data were collected from three sources: a public opinion survey, restroom audits, and health department inspections. Data from the public opinion survey were used in the creation of an audit sheet for the restaurant restrooms. Data from the audits were compared to data from the health department inspections to determine if relationships existed.

Public Opinion Survey

In order to develop the public opinion survey, four faculty members in the Department of Hospitality and Tourism Management who specialize in food safety were consulted and provided input as well as reviewed the survey prior to pilot testing. In addition, three graduate students, also majoring in food service management and two members of university building maintenance staff, whose responsibilities include the cleaning of public restrooms, were consulted. The researcher also met with the administrator of the County Department of Health (CDH) and a CDH inspector to learn the inspection process of the health department. Using input from this panel, a list of 27 criteria for evaluating the cleanliness of a public restroom was developed. A group of thirteen 'typical' consumers were then asked to evaluate the 27-item list and determine which items were the most important to them when evaluating restroom cleanliness. The responses from the 13 consumers, six males ranging in age from 23 to 76, and seven females ranging in age from 22 to 59, were used to reduce the 27-item list down to 12 categories of criteria (listed in Table III). A public opinion survey was then developed, which included the 12 items identified as important by the group of consumers described earlier.

To facilitate administration of the survey, a journalist with the local newspaper where this study was done was approached with the survey. The newspaper is distributed in an area with a population of nearly 125,000 people and is read by 73% of them (over 91,000). The paper is also available for free online. The journalist was given an interview about the research being conducted, and published an article featuring this research in a weekly feature column that focuses on public health issues. That article discussed what the researcher was doing and why and explained why the public's input was an important step in the research process. The newspaper article included a web address that took willing participants to the survey, hosted on-line which yielded 178 usable responses.

The on-line public opinion survey was anonymous and consisted of 24 questions. Respondents were asked to rate the 12 criteria as to each one's level of importance as a factor in determining whether a restroom is clean or not. Four of the questions were to determine the respondents' demographics. Respondents were also asked about their dining habits and how often they read the CDH inspection results in the newspaper. Six of the questions asked for the respondent's opinion on restrooms, their relationship to restaurant kitchens, and the respondent's level of concern with food safety.

The results of the survey were analyzed with commercially available statistical analysis software (SAS version 9.1). The GLM procedure was performed, and six categories emerged as significantly different (p values less than 0.05). One main division between categories occurred where mean scores on a five point scale (1=not at all important, 5=extremely important) that were rounded to 4.5 and above were significantly different to those below. From these results, the two categories of criteria that emerged from the 12 major criteria were: those that were deemed critical to the public for determining whether a restaurant restroom is clean, and those that were designated as not critical, but still important to the process of determining restroom cleanliness (see Table I). These two categories were defined as major and minor demerits.

Table I. Variables used for ANOVA tests.

Kitchen Violations	Women's Restroom Demerits	Men's Restroom Demerits
Critical	Major	Major
Non-Critical	Minor	Minor
Total Violations (C+NC)	Total Demerits (C+NC)	Total Demerits (C+NC)

Auditing Restaurant Restrooms

Based on the two categories of criteria determined by the public opinion survey (major and minor demerits), it was possible to assign a summary score to restaurant restrooms. Cooperation was sought from the county department of health. In the county where this research was done, health department inspection scores are posted weekly in the local paper, ten days after the inspection occurred (to give the establishment opportunity to respond or correct violations). Further, health department inspections for every establishment in the county are available to the public on the county website. To assist with the research, the CDH sent the researcher advance copies of the most recent restaurant inspections, before the results were printed in the newspaper. Using this list of establishments as a guide, the researcher sent auditors to each restaurant to inspect their restrooms. The advance copies of the inspections were important so that the auditors could audit an establishment as close to the time of the health department inspection as possible, and yet not have any possibility of knowing the outcome of the most recent health department inspection.

There were two auditors for this study, one male and the other female, so that they could audit the appropriate restrooms. To have consistency, the same two auditors were used for the entire study. Auditors received a training session, where they were instructed on the auditing checklist items, their definitions, and how they should be interpreted. Response options for the checklist were limited to 'yes' or 'no' to facilitate easy scoring by the auditors. The auditors were then given a list of 10 restaurant restrooms to audit. Their findings were then compared against the findings of a separate pair of auditors who received the same training, instructions, and list of restaurants to make sure that there was consistency in their findings and that they would be reliable. Upon completion of this training, the auditors were then given lists of restaurants to audit on a weekly basis as the researcher received them from the health department.

Audits were performed typically between 2:00 pm and 4:00 pm. The reason for this time period was that an audit of the restrooms before customers entered would be to essentially evaluate the cleaning from the day before or that morning. Afternoon auditing times allowed the restrooms time to have been used, and also allowed management time to check the conditions and make corrections, if it was a priority to them.

The auditors did not use the entire health department inspection criteria as the basis for the restroom audits. There were several reasons for this. First, the list used by the health department contains thousands of items, most of which are not pertinent to the restroom. Very few of the items deal directly with the restroom in the health code for the state where this research was conducted. Second, as discussed earlier, what the health department considers an important item may not be as important to the public as other areas of the restroom that the health department does not concern itself with.

The auditors therefore used a checklist that consisted of 39 items to audit restrooms. Each of the 39 items on the checklist was a detailed part of one of the twelve categories of criteria discussed earlier in the public opinion survey or was a specific health department violation pertaining to the restroom.

The results of these audits were then categorized into 12 areas and given a value of either major or minor. Major and minor classifications were based on the results of the public opinion survey which suggested the public's perception of the severity of the issue.
Scoring Audits and Health Department Inspections

Once the restaurant restrooms were rated with major and minor demerits, it was then necessary to compare those audits with the inspections done by the CDH. In the county where this research was done, health inspection violations are not given a numerical value, but rather scored as critical or non-critical violations. However, in order to run the necessary statistical analyses, it was necessary to assign a number value to the inspection violations so that a summary score could be obtained to compare against the audit score summary.

Lee (2006) determined that the weight for critical to non-critical violations should be three to one (3:1). In other words, three non-critical violations equal one critical violation. Given this information, it then became possible to assign number values to the inspections. Each critical violation reported by the health department was given the value of three, and each non-critical violation reported was given the value of one.

Statistical Comparison of Restroom and Kitchen Cleanliness

Statistics were run on the results generated by the audits and the health inspections using SAS. The data were checked for correlations. First, the total numbers (both major and minor) of demerits were checked for correlations with the male restrooms and the female restrooms. Tests were also run to see if there was a correlation with the total number (critical and non-critical) of kitchen violations and the total number of restroom demerits, for both male and female restrooms. Then data were checked to see if there was a correlation with the total number of kitchen violations and the total number of demerits in the women's restroom, as well as a correlation with the total number of kitchen violations and the total number of demerits in the men's restroom. Tests for correlations were also run based on type of violation. Finally, data were checked to see if the minor demerits in the women's restroom were correlated with the total number of kitchen violations, and if the major demerits in the women's restroom were correlated with the total number of kitchen violations. Then a similar test was done for the men's restroom.

The next statistical test used was the Analysis Of Variance, or ANOVA procedure. This procedure was performed 18 times, using the matrix in Table 1. For the first six times, the dependent variable was the total number of violations (both critical and non-critical) in the kitchen. This test was run for the independent variables total women's restroom demerits, total men's restroom demerits, major women's restroom demerits, minor women's restroom demerits, major men's restroom demerits, and minor men's restroom demerits. For the second six tests, the dependent variable was critical kitchen violations, and the same six independent variables were tested. For the final six tests, the dependent variable was non-critical kitchen violations, and again the same six independent variables were tested.

Finally, to try to determine whether any set of data in the restrooms was a good predictor for any of the data taken from the kitchens, regressions were run on the data. Nine separate regressions were performed. The total number of women's demerits and the total number of men's demerits were run together to see if they predicted the total number of kitchen violations. Then each was run separately; women's major and minor demerits to see if they predicted the total number of kitchen violations, then men's major and minor demerits to see if they predicted the total number of kitchen violations. These steps were repeated, changing the item being predicted from total kitchen violations to critical kitchen violations and then testing all three regressions, and again to non-critical kitchen violations, with the same three regressions tested a final time.

All nine of these regression tests were performed twice. The first time this set of tests was run, simple counts of the number of demerits and violations were used. The second time the nine tests were done, critical items for the kitchen and major items for the restrooms were weighted according to the results of the study done by Lee (2006).

RESULTS

Public Opinion Survey

There were 198 responses to the survey, yielding 178 usable responses. Twenty of the respondents did not complete the survey and were therefore not included in the analysis. Nearly 62% of those who responded were from the county where this study was conducted. Approximately 74% of the respondents were female, and the average age of the respondents was 41.5 years old, with 19 being the youngest respondent and 77 being the oldest, and the standard deviation being 13 years. The highest levels of education achieved by the respondents were broken down as follows:

- 1.7% had only some high school,
- 17.4% had a high school diploma or GED,
- 11.2% had trade or technical schooling,
- 35.4% had an undergraduate college degree,
- 24.2% had a graduate college degree, and
- 10.1% had postgraduate/professional degree.

Respondents were asked how many times a week they ate out; responses varied from 0.25 to 21. While the mean response was four, the median was three and the mode was two. Respondents were asked whether they felt that the condition of a restaurant's restroom is an indicator of the condition of that establishment's kitchen. Seventy-three percent responded 'Yes,' 20.22% responded 'Unsure,' and 6.74% responded 'No.'

When respondents were asked how concerned they were about food safety when eating out in a restaurant, 31.8% of respondents were not at all concerned, 38% were slightly concerned, 21.2% were moderately concerned, 8.4% were strongly concerned, and 0.6% were extremely concerned. Responses were on a five point scale, with one being 'not at all concerned' and five being 'extremely concerned.' The mean was 2.1. Respondents who frequently read the published health inspection reports are significantly more concerned with food safety when they eat out ($F=15.44$, $p=0.0001$).

The respondents were also asked if they read the health inspection reports published in the newspaper. Twenty-four percent responded 'Never,' 17% responded 'Occasionally,' 37% responded 'Regularly,' and 21% responded 'Always.' Respondents were regrouped by frequency of readership into two categories; those who read the reports frequently (always or regularly), and those that read the reports rarely (occasionally or never). Of the female respondents, 55% responded that they read the reports frequently, and 45% read them rarely. Sixty-seven percent of male respondents read them frequently, and 33% read them rarely. There was no significant difference by gender for frequency with which respondents read the reports, therefore additional analyses concerning inspection score readership were not conducted separately by gender. Readership of published health inspection scores was related to the age of the respondent (Table II). Readership declined as age increased.

Table II. Mean Age of Respondents by Frequency of Health Inspection Score Readership.

T Grouping*	Mean Age	N	Frequency of Reading
A	48.71	42	Never Read Scores
B A	43.70	30	Occasionally Read Scores
B C	38.99	65	Regularly Read Scores
C	35.69	35	Always Read Scores

*Rows with the same letter are not different at P≤0.05

The respondents who frequently read the inspection scores indicated that 64% felt that the condition of a restaurant's restroom is an indicator of the condition of the kitchen, 28% were unsure, and 8% did not feel that the restroom indicates the condition of the kitchen. Of the respondents who rarely read the inspections, 85% felt that the restroom is an indicator of the condition of the kitchen, 9.5% were unsure, and 5.5% did not feel that the restroom indicates the condition of the kitchen. Note that while 73% of all respondents feel that the restroom is an indicator of the kitchen, 64% of those who frequently read the health inspection scores agree, and 85% of those who rarely read the scores agree. Chi-square analysis (2, N=178) = 10.1325, p=0.0063 indicated that respondents who frequently read health inspection scores are statistically less likely to think that the condition of a restaurant's restroom is an indicator of the condition of the kitchen as compared to those who less frequently read the scores.

A GLM procedure was used to determine significance (p value less than 0.05 was considered significant). As illustrated in Figure 2, a clean restroom is significantly more important in deciding where to eat to those who rarely read the reports (F=5.85, p=0.0165). Even further, respondents who rarely read the reports are significantly more likely to have chosen not to eat in a restaurant based on a visit to the restroom (F=8.63, p=0.0037). Those who rarely read the health inspection reports also rated the following restroom criteria significantly higher than those who read them frequently: odor (F=4.92, p=0.0278), no hot water (F=12.16, p=0.0006), dirty, soiled, or wet sink or counter (F=5.55, p=0.0196), dirty floor (F=4.73, p=0.0310), no paper towels or drying device (F=20.65, p=<0.0001), dirty or cracked wall, ceiling, or floor tiles (F=16.64, p<0.0001), trash in the toilet (F=13.72, p=0.0003). Overall, over 70% of the women and over 60% of the men stated that they had chosen not to return to a restaurant based on a visit to the restroom.

Mean importance rating responses to the 12 categories of criteria are shown in Table III. Variables such as age and gender significantly affected response levels on the 12 restroom criteria. Looking at the criteria affected by age, no particular pattern or grouping emerged. However, age was a significant factor with eight of the 12 restroom major categories, as shown in Table 2. The presence of an odor was significantly more important to older respondents (t=2.29, p=0.0234). It was also significant after controlling for gender (t=2.23, p=0.0269), however, after controlling for how often the respondent reads the health inspections, age was no longer significant. Whether the toilet was clogged or broken was significantly more important to older respondents (t=2.14, p=0.0337). It was also significant after controlling for gender (t=2.16, p=0.0325), however, after again controlling for how often the respondent reads the health inspections, age was no longer significant.

Table III. Consumer Opinion of the Importance of These Criteria to Restroom Cleanliness (n=179)

Categories of Demerit*	Overall Mean**	Significantly Different by Consumer Age***
Major**		
Dirty, soiled, or wet toilet	4.74[a]	No
Evidence of insects/rodents	4.71[a]	No
Toilet clogged or broken	4.60[ab]	Yes
No toilet paper	4.59[ab]	Yes
No soap	4.49[b]	No
Minor**		
Odor	4.27[c]	Yes
No paper towels/drying device	4.22[cd]	Yes
Dirty floor (mud, litter, standing water, etc.)	4.20[cd]	Yes
Dirty, soiled, or wet sink/counter	4.08[d]	Yes
No hot water	3.88[e]	No
Trash in toilet (cigarette butts, paper, gum, etc.)	3.77[e]	Yes
Dirty or cracked walls, ceilings or floor tiles	3.53[f]	Yes

* = Categories of demerits that were used in creation of 39 point restroom audit checklist.

** = Responses on a 5-point scale. 1=Not at all important, 5=Extremely important. Means with different letters were significantly different at α=0.05.

*** = Items significantly more important as consumer age increased, α=0.05.

**** = Means from the consumer survey that were rounded to 4.5 and above were classified as major and those below were classified as minor criteria.

Five of the responses to the scoring of the 12 restroom cleanliness criteria were significantly different by gender. In all five cases, females rated the items as more important than males. The absence of hot water was significantly more important to females than males ($F=13.20$, $p=0.0004$). The absence of soap was also significant ($F=4.18$, $p=0.0423$), as was evidence of insects or rodents ($F=6.30$, $p=0.0130$). A soiled, dirty, or wet sink or counter was significantly more important as well ($F=7.33$, $p=0.0075$). A dirty floor (mud, litter, standing water, etc.) was also significantly more important to females ($F=14.91$ $p=0.0002$).

The frequency with which respondents read the health inspection reports was significant in terms of how respondents felt about the current state of restroom cleanliness. Those that rarely read the health

inspections felt that restrooms are significantly cleaner than those who read the reports frequently ($F=6.27$, $p=0.0132$). In completing the sentence "Overall, I feel that restaurant restrooms are:" 0.5% replied 'Very Dirty,' 17.3% 'Dirty,' 27.9% 'Neutral,' 48.6% 'Clean,' and 5.6% 'Very Clean.' Responses were on a five point scale, with one being 'very dirty' and five being 'very clean.' The mean score was 3.4.

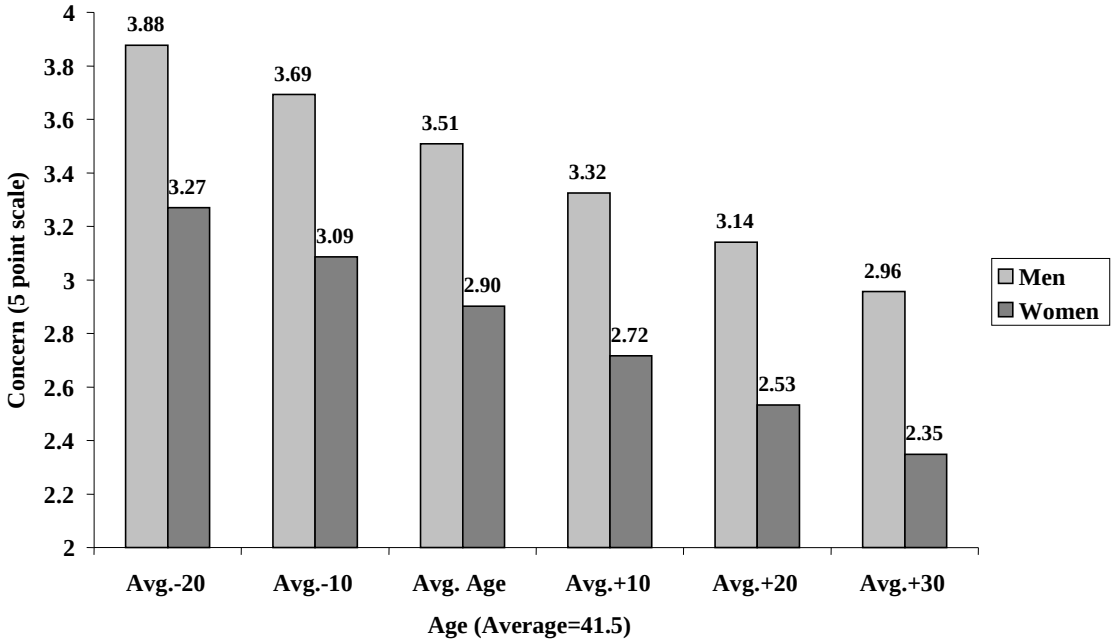
The condition of the restroom can be influential when deciding where to eat, when deciding once there whether to eat at the chosen establishment, and when deciding whether to return to an establishment. The mean score on a five point scale with one being "strongly disagree" and five being "strongly agree" was 3.8 for the statement "A clean restroom is important to me when deciding where to eat." For the statement "I have chosen not to eat in a restaurant based on a visit to the restroom," the mean was 3.3, and for the statement "I have chosen not to return to a restaurant based on a visit to the restroom," the mean score was 3.4.

The higher the importance rating respondents gave to a clean restroom when deciding where to eat, the more likely they were to have chosen not to eat in a restaurant based on a visit to the restroom ($t=10.745$, $p=0.000$). This was also true when cleanliness was compared to having chosen not to return to a restaurant ($t=6.311$, $p=0.000$). A similar relationship existed for concern about food safety. The more concern respondents expressed for food safety, the more likely they were to have chosen not to eat in a restaurant based on a visit to the restroom ($t=4.313$, $p=0.000$), and the more likely they had chosen not to return to a restaurant ($t=3.739$, $p=0.000$).

Respondents' level of concern about food safety was tested to see if there were relationships with gender and age. A t-test (LSD) was performed regressing gender on concern for food safety, with the result being that males claim to be more concerned with food safety than females ($F=21.08$, $p<.0001$), shown in figure 1. Also significantly different by gender was a clean restroom being important in deciding where to eat ($F=6.46$, $p=0.0119$), with females placing more importance on the restroom than males. Having chosen not to eat in a restaurant based on a visit to the restroom was not significantly different by gender, however having chosen not to return based on a visit to the restroom was ($F=4.04$, $p=0.0459$); again, females were more likely to have made that decision.

When the same tests were performed on these questions analyzed by age instead of gender, age was significant with concern for food safety ($t=-4.03$, $p<0.0001$), with younger respondents being significantly more concerned with food safety than older ones (Figure 1). Whether a clean restroom was important when deciding where to eat was only marginally significant for age ($t=1.92$, $p=0.0567$). Whether a person had chosen not to eat in a restaurant based on a visit to the restroom was significant based on age ($t=2.95$, $p=0.0037$), with the likelihood of that decision being made increasing with age. Whether a respondent had chosen not to return based on a visit to the restroom was also significant ($t=2.62$, $p=0.0097$), again with older respondents being more likely to have made that decision.

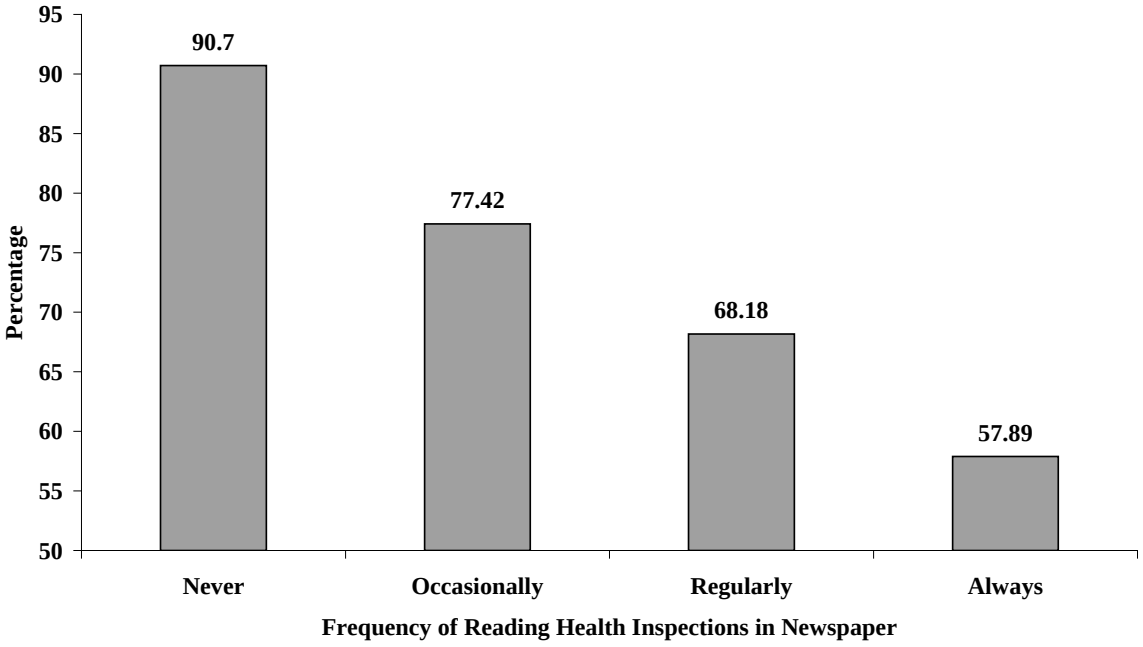
Figure 1. Concern about Food Safety by Age and Gender on a 5 point scale, 1=Not at all concerned, 5=Extremely concerned.



Previous research has indicated that 78% of the public feels that the restroom is a good indicator of the condition of the kitchen (Blackiston & Evans, 2004). This survey supports that research as 130 out of 178 respondents (73%) felt that the condition of a restaurant's restroom was an indicator of the condition of that establishment's kitchen. Twenty percent of respondents were unsure, leaving just under 7% who felt that the condition of restaurant's restroom is not an indicator of that establishment's kitchen.

Data indicated that the more likely the respondent was to read the health department inspections in the newspaper, the less likely they were to believe that the restroom is an indicator of the condition of the establishment's kitchen (Figure 2). The respondents who indicated that they never read the reports felt that the restroom was a good indicator over 90% of the time. This number fell steadily as regularity of readership increased; those who always read the health inspection reports felt that the restroom is a good indicator only 58% of the time. It is worth noting however, that over fifty percent of respondents who answered that they always read the health inspection reports still believed that the restroom is a good indicator of the condition of the kitchen.

Figure 2. Percentage of Respondents who believe Restroom Cleanliness Indicates Kitchen Cleanliness Depending on how often they read the TCDH Inspections



Health Department Inspections and Restroom Audits

Results from 159 restaurant health inspections were obtained from the CDH in Indiana for the county where this research was being conducted, conducted over a five month period. Of all the restaurant inspections collected, none of the restaurants were cited by the CDH for specific violations in the restroom. The average total number of violations for these 159 inspections was 4.5. The average number of critical violations per restaurant inspection was just below two (1.97), while the average number of non-critical violations was two and a half (2.53).

A total of 54 restaurants had their restrooms audited. The average total number of audit demerits per restaurant was 11. The women's restrooms averaged four demerits, both major and minor, while the men's restrooms averaged over seven (7.28). The average number of minor demerits in the women's restroom was three and a half, with the average number of major demerits at one-half. The average number of major demerits for the men's room, however, was over one and a third (1.39), with the average number of minor demerits just below six. This means that the men's restroom averaged nearly twice as many total demerits and nearly three times as many major demerits as the women's restroom. Additionally, it had more than one and a half times as many minor demerits as the women's restroom had. The three most common demerits in both the men's and women's restrooms were clogged toilets (major demerit), cigarette burns (minor demerit), and evidence of insects/rodents (major demerit). Also commonly found were overflowing trash receptacles (minor demerit).

Within the given time frame, auditors were able to visit 54 establishments' restrooms, thus of the 159 health department inspections, 54 were used to pair against the restroom audits. These 54 appear to be a representative sample of the entire list, as their numbers were fairly similar to that of the entire population. Of the 54 inspections, the average total number of violations was 4.28 (population average 4.5). The average number of critical violations was 1.92 (population average 1.97), and the average number of non-critical violations was 2.36 (population average 2.53).

Results of Statistical Comparison

After checking for the many correlations described in the methodology, no statistically significant correlations were discovered. The results of the ANOVA also did not indicate a statistically significant relationship. Finally, the results of the regression tests indicated that no set of restroom violations was a good predictor of kitchen violations. According to the results of this research, the restroom is in fact not a good indicator of kitchen condition. Although the women's restroom was nearly twice as good a predictor of kitchen condition than the men's restroom, its ability to predict was not statistically significant.

CONCLUSION

What one can deduce from these data is that as the public increasingly informs themselves as to the condition of the establishment as reported by the health department, they rely less on other sources such as the restroom for insight to the back-of-the-house operation. However, a large amount of stock is still placed on the condition of the restroom. Additionally, there is a significant negative relationship between reading the health department inspections regularly and feeling that a clean restroom is an important factor when deciding where to eat. Whether the respondents had chosen not to eat at an establishment based on a visit to the restroom and whether respondents had chosen not to return to an establishment based on a visit to the restroom both had strong negative relationships with how often the respondent reads the inspection reports. It is possible that the respondents feel that they are being properly informed by what the health department reports, so that there is less of a need to base their actions and opinions as much on what they see during their visit.

Based on the data collected from the public opinion survey, we can conclude several things about the dining public. First, younger clientele are more concerned with food safety than older clientele. Both age and gender play important parts in whether a clean restroom is important to them when deciding where to eat. Men claim to be more concerned with food safety than women. Interestingly, in a seeming contradiction to that conclusion, women are more likely to get up and leave if they have an unpleasant visit to the restroom. They are even more likely not to return if they didn't like what they experienced in the restroom. However, this apparent contradiction is explained by the data, where it is noted that the more concern respondents expressed having with food safety, the less likely they were to believe that the condition of the restroom was an accurate indicator of the condition of the kitchen.

This answers the first of the research questions; is the public's concern with food safety related to their concern with cleanliness of restrooms? It is related, but it is a negative relationship. The second research question asked if the condition of an establishment's restroom has an impact on the customers' restaurant decision-making behavior. We saw that that is indeed the case. The majority of respondents stated that they had chosen not to return to an establishment based on what they experienced in the restroom. Additionally, the mean response was 'agree' to "A clean restroom is important to me when deciding where to eat."

The third research question asked which specific aspects of restroom cleanliness are most important to customers. These were determined by the study, and were the factors identified as 'major' demerits on the restroom audits. Those factors are a dirty, soiled, or wet toilet, evidence of insects or rodents, a toilet that is clogged or broken, a lack of toilet paper, and a lack of soap. The three most common demerits in both the men's and women's restrooms, as mentioned previously, were clogged toilets (major demerit), cigarette burns (minor demerit), and evidence of insects/rodents (major demerit). Also commonly found were overflowing trash receptacles (minor demerit).

The fourth research question wanted to determine if there is a relationship between restroom cleanliness and health inspection scores. The results of this study indicate that no such relationship exists. The men's

restroom averaged nearly twice as many total demerits (7.28) and nearly three times as many major demerits (1.39) as the women's restroom (4 and 0.5, respectively). The average total number of demerits (male and female) for an establishment was 11, while the average number of health inspection violations for the same establishments was 4.5. Although the women's restroom was nearly twice as good a predictor than the male's, its ability to predict kitchen condition was not statistically significant.

The fifth and final research question asked if variables such as age, gender, education, and knowledge of health inspection scores have any impact on the customers' perception of restroom cleanliness. Age and gender, as discussed previously, do effect how much importance respondents place on the condition of restrooms. Knowledge of published health inspection scores had an effect as well, as the results demonstrated that the more respondents typically read inspection scores, the less likely they were to believe that the restroom was a good indicator of the condition of the kitchen. Education did not have an effect.

None of the 154 health inspections gathered for this research cited an establishment for a violation in the restroom, however many of the audits did. The possible reasons for this are many and varied. One possible, though unlikely, reason for the discrepancy is that the health department inspections and the restroom audits were not performed on the same day and at the same time. Another possible explanation is that health inspectors typically start their inspections in the kitchen, which gives employees time to quickly tidy up other areas of the restaurant. Additionally, inspectors may not be as concerned with the restroom. Perhaps due to limited time, they may choose to spend most of their time in the kitchen. They may feel that other areas are less important in determining the state of cleanliness; however one then wonders if the health inspection scores accurately reflect the property if they are not including all areas of the establishment, such as the front of the house and the restroom.

The most likely explanation is that the department of health has its criteria for inspecting a restroom for possible hazardous violations, but this study determined that these criteria are not the same as what a consumer uses when forming an opinion of the state of the restroom. Many of the violations found during the audits were not health code violations, rather they were items found to be important to the public as determined by the research. Therefore, these items would not appear on a health department inspection report.

The health department checks for a few, very specific, items in the restroom: i.e. soap, hot water, drying device, floor drain, self-closing doors. Perhaps the inspection system for restrooms is incomplete, and could be modified to also include the items that the public feels make for a clean restroom: i.e. dry toilet seats, stocked toilet paper, and functional toilets.

Another factor to consider is the definition of the words "clean" and "sanitary." For the health department, those words mean no violations, however "clean" and "sanitary" to the public mean something different; shiny and free from dirt come to mind. While the health department is concerned with controlling for contamination, cross-contamination, and the spread of disease-causing bacteria, the public expects the restroom to be free from dirt and odor, with dry fixtures and adequately stocked supplies. Additionally, although the results of this study suggest that there is no relationship between the cleanliness of the restroom and the cleanliness of the kitchen, the public still could be justified for using the restroom as a barometer for the restaurant. Management's attitude toward cleanliness and sanitation issues might be reflected by the condition of the restroom. Testing that theory was beyond the scope of this study.

This study has both implications and applications to the foodservice industry. This study confirms that the public is concerned with food safety, and the perception by the vast majority is that the restroom is an

accurate reflection of the sanitary conditions of the kitchen. Even the majority of those who regularly inform themselves by reading the health department inspection reports feel that to be true. The public does feel that a clean restroom is important, and they will choose not to eat at or return to an establishment if the restroom is not appealing to them. In this study, over 70% of the women and over 60% of the men had chosen not to return to a restaurant based on a visit to the restroom. The potential loss of repeat business and negative word-of-mouth publicity is self-evident.

Consumers will use what information is available, even if it is not necessarily accurate. The two aspects that were the most important to the public were a dirty, soiled, or wet toilet (not necessarily a health code violation), and evidence of insects or rodents (a health code violation). The public considered three other criteria to be major; a toilet that is clogged or broken, no toilet paper, and no soap. Therefore, a wet or clogged toilet or inadequately stocked supplies could possibly cost an establishment its otherwise sanitary reputation. To avoid this and similar pitfalls, restaurateurs should implement routine maintenance schedules for their establishments. Regular upkeep of their restrooms could do more to positively affect their bottom-line than previously believed.

This study was performed prior to the Covid-19 pandemic; therefore we can only speculate on how the public's concern for hygiene and cleanliness may have changed recently. However, what this study highlights and should be noted by all restaurateurs is that our guests use visual clues to make assumptions about areas they cannot see. The restroom, perhaps because it is an intimate space, carries much weight in affecting the assumption of what the kitchen and food production areas must be like. In particular, high-touch areas within the restroom were more important to the public than other areas. Restaurateurs must understand that guests will use any source of input to inform their opinion of an establishment's sanitation and behave accordingly. They must understand and then communicate to their staff the importance of the restroom as a sanitation indicator and marketing tool.

LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

Respondents to the survey were self-selected, therefore only those who felt strongly about sanitation and cleanliness issues were likely to respond. However, this is not completely undesirable, as the primary goal of the survey was to develop a rating system for what sanitation and cleanliness issues are important to the public. Therefore, having responses from those who feel strongly about such things is a desirable outcome.

Ideally, a future study could be performed in which the same (health department) inspector both inspects the kitchen and audits the restrooms using the audit tool. This would provide a more accurate 'snapshot' of the condition of the restroom at the time of the health inspection, and control for inspector biases. Future studies could also be done to determine which information has more influence on the behavior of the customer, the condition of the restroom or the published health inspection score.

If a tool could be developed to measure management's attitude toward cleanliness, this could be included as part of a future study as well. Whether management attitude toward cleanliness is indeed reflected in the condition of the restroom could then be determined.

REFERENCES

Aksoydan, E. (2007), "Hygiene factors influencing customers' choice of dining-out units: Findings from a study of university academic staff," *Journal of Food Safety* Volume27, Issue3 August 2007 Pages 300-316

Amer, S. (2003), "A sinking feeling", *Restaurant Business, 102*(1), 84

Bigger, A. & Bigger, L. (2004), “The great detractors: The Perception versus the reality of cleanliness”, *Executive Housekeeping Today*, May 2004, 6-9, 17.

Blackiston, H. & Evans, C. (2004), “The lavatory laboratory”, *Restaurant Hospitality*, *88*(5) 142-144.

Black Sheep Restaurant Group, (2020), “SOP: COVID-19 Playbook,” Revised Edition, Updated May 8, 2020, available at: https://blacksheeprestaurants.com/wp-content/uploads/2020/05/BSR-COVID19-SOP-8052020.pdf

Bock, K., Bock, S., & Faass, N. (2003), *The Germ Survival Guide*. New York: McGraw-Hill.

Bourdain, A. (2000), “Kitchen Confidential: Adventures in the Culinary Underbelly. Bloomsbury Publishing.

James Beard Foundation/OpenTable survey, (February, 2021), available at: https://www.jamesbeard.org/blog/opentable-feb2021-survey

Kim, H & Bachman, J. (2019), “Examining customer perceptions of restaurant restroom cleanliness and their impact on satisfaction and intent to return, *Journal of Foodservice Business Research,* March, 2019, 3.

Klara, R. (2004a), “The comfort zone”, *Restaurant Business*, *103*(15), 14-16.

Klara, R. (2004b), “Table the issue”, *Restaurant Business, 130*(18), 14-16.

Lockyer, T. (2003). Hotel cleanliness- how do guests view it? Let us get specific. A New Zealand study. *International Journal of Hospitality Management*, 22(3), 297-306.

Modern Restaurant Mangament (2021), Restaurants: The New Battlefield for Customer Experience” retrieved July 29, 2021 from https://modernrestaurantmanagement.com/restaurants-the-new-battlefield-for-customer-experience/

Prewitt, M. (2001), “Operators clean up image of restaurant rest rooms”, *Nation’s Restaurant News*, *35*(2), 1-2.

Ruggless, R. (2001), “Straight flush: Keeping a clean bathroom always leads to a winning hand”, *Nation’s Restaurant News*, *35*(23), 66

What makes a great bathroom? (2003). Caterer & Hotelkeeper, 192(4294), 79.