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**IMPROVING SERVICE QUALITY THROUGH
SELF-MONITORING**

by

John Patrick McDonough III

**A Dissertation
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Doctor of Philosophy
Department of Psychology**

**Western Michigan University
Kalamazoo, Michigan
June 1992**

IMPROVING SERVICE QUALITY THROUGH SELF-MONITORING

John Patrick McDonough III, Ph.D.

Western Michigan University, 1992

A multiple-baseline across-restaurants design was used to assess the effectiveness of a quality guarantee (performance checklist) on the quality of food served at two carryout pizza restaurants in a Midwestern city of approximately 100,000 people. The research consisted of having the quality of food monitored by research assistants who served as mystery shoppers trained in the quality standards of the restaurants. Quality was monitored during baseline, when normal operating procedures were in effect at the restaurant, and during intervention, when employees who delivered food to customers were required to sign a quality guarantee. In one intervention phase, employees checked off the quality guarantee if the order met quality standards, and the store's performance was graphed and posted for the employees to review. In a second intervention phase, employees signed their names to quality guarantees if the order met quality standards. In both cases, the quality guarantees (performance checklists) were designed to help the workers with the monitoring of the quality of food being delivered to customers. Both types of quality guarantees were equally effective in improving quality over baseline with no noticeable difference between the two types of quality guarantees. These results are discussed in terms of reactivity to self-monitoring.

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Improving service quality through self-monitoring

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Western Michigan University, 1992

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ACKNOWLEDGMENTS

I would like to thank: Ms. Tansi, Ms. Nails, Jim Whitehouse, Jane Howard, and especially Bruce Hesse for their guidance and excellence in teaching. Further, I would like to thank Ann Thompson for her inspiration and help throughout the past seven years, Tom Coyne, Laurel Grotzinger and The Graduate College staff for their friendship and help, my family (who really didn't think I was in college) who supported me through all those vacations in Las Vegas (especially Kathy and Tom who housed me and Joe and Jim who supported my late night activities in '83), and lastly, Leanarda for whom I owe everything and without whom I would not have made it this far.

John Patrick McDonough III

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INTRODUCTION

Self-Monitoring

Self-monitoring is defined as a two-step process; a person must first: (1) discriminate the occurrence of behaviors, and (2) systematically record the observations (Nelson & Hayes, 1981). Self-monitoring, widely used as a data collection procedure, has been shown to have reactive effects on a variety of behaviors, including study behavior (Brodén, Hall, & Mitts, 1971), academic productivity (Lloyd, Bateman, Laudrum, & Hallahan, 1989), and alcohol abuse (Garvin, Akorn, & Faulkner, 1990; Sobell, Bogardis, Schuller, Leo, & Sobell, 1989); and while it is used in other areas (e.g., social work and organizational behavior management), its utility in areas outside clinical treatment environments has yet to be determined (Kopp, 1988; Nelson & Hayes, 1981).

The reactivity of self-monitoring (self-checklists), according to Nelson and Hayes (1981), is explained by three different theoretical viewpoints: Kanfer (1970, 1975, 1977), Rachlin (1974), and Nelson and Hayes (1981). First, Kanfer's position is stated as a three stage model of self-regulation: self-monitoring, self-evaluation, and self-reinforcement. With this position, the person must first observe and record his/her own behavior, compare or evaluate it against some predetermined criterion, and either reinforce or punish his/her performance by either covert verbalizations or by overt self-administration of external consequences. This position is dependent on a reactive chain that begins with the act of self-monitoring.

The second position outlined by Nelson and Hayes (1981) is explained by Rachlin (1974). This position proposes that self-monitoring serves as a cue for

performance, as compared with Kanfer's motivational perspective. Rachlin proposes, like Kanfer, that reactivity of self-monitoring begins with the observance and recording of the target behavior. However, unlike Kanfer, Rachlin indicates that whether or not self-administered consequences are engaged in, the self-monitoring reminds the person of the external environmental consequences that control the response.

The third position was described by Nelson and Hayes (1981), and retains Rachlin's view that the external consequences ultimately control the response frequency. However, this view maintains that the procedure of self-monitoring cues the external consequences rather than just the self-recording response. A major distinction between the views of Kanfer, Rachlin, and Nelson and Hayes, is a question of when the reactive chain begins and whether reactivity to self-monitoring can be maintained without direct external consequences. Kanfer's position maintains that self-reinforcement should maintain response frequency, while Rachlin and Nelson and Hayes rely on external environmental consequences for an explanation of control over response frequency.

Applications of self-monitoring in organizational settings have generally focused on self-monitoring in combination with some other variable (e.g., feedback, goal setting, other monitoring); it has rarely been used alone (Kopp, 1988). A review of the current literature (1988 to present) and a thorough review of the literature prior to 1988 by Kopp, showed that the effects of self-monitoring without individual graphing of behavior, goal setting, or some type of feedback have not been considered. While the utility of self-monitoring used with other variables is widely known, additional studies investigating the effects of self-monitoring alone would be useful.

An area outside the clinical environment in which self-monitoring has been used is business and industry, where employees use job aids and/or checklists as part of interventions to improve the quality of products and performance. The effectiveness of self-monitoring techniques is particularly promising in business and industry (e.g., restaurants) where there is a clear need for straightforward and efficient methods to produce immediate effects on performance. This is true especially in organizations with high turnover rates and the inability to provide adequate in-house training (Zuckerman, 1988).

Performance Management

Techniques used in business and industry to improve performance and production vary from procedures developed by Fredrick Taylor at the turn of the century to those developed around the end of World War II (e.g., quality circles, statistical process control, zero defects, and the Ishakawa inprocess system) (Evans & Lindsay, 1989). Other techniques introduced in the late 1960s and mid 1970s, which refined and modified traditional techniques, incorporated behavior modification methods to increase quality of products and services. These hybrid applications are known as performance management techniques. One such hybrid technique was developed from the Ishakawa inprocess system (Ross, 1988). This procedure requires that workers sign (self-monitor) either the product or a document guaranteeing the quality of the product. Performance management techniques often use prompts and/or checklists to maintain performance or quality standards in tandem with traditional techniques (e.g., Henry & Redmon, 1990) or by themselves to increase both performance and production (e.g., DeRosa, 1987; Lennox, 1981).

Performance management methods that incorporate self-monitoring have been shown to be effective in a variety of settings, for example, in reducing absenteeism (Frayn, 1989), increasing client contact in a mental health setting (Calpin, Edelstein, & Redmon, 1990), decreasing abuse of National Collegiate Athletic Association rules (Kilpatrick, 1987), and increasing service quality and the quality of food preparation in the restaurant industry (e.g., DeRosa, 1987; George & Hopkins, 1989; Goncalves, 1974; Johnson & Masotti, 1990; Lennox, 1981; Patton, Red Lobster, & Bailey, 1990; Ralis & O'Brien, 1987).

Service Quality

Research has demonstrated the benefits of superior quality in contributing to market share and profits (Lefevre, 1989). The ability to assess and assure service quality can affect directly the survival of a service firm, adding importance to research in the area of service quality (Allen & Faulhaber, 1991). Service accounts for 60% of the gross national product and 70% of the jobs in the United States (Albrecht & Zemke, 1985) and accounts for approximately 70%-80% of all investment in information technology (Brown, Gummesson, Edvardsson, & Gustavsson, 1991). Early research in the area of service quality revealed that consumers evaluate service quality on 10 key dimensions: (1) tangibles (e.g., the appearance of the service facilities and personnel), (2) reliability (e.g., consistency of performance and dependability), (3) responsiveness (e.g., timeliness of service), (4) competence (e.g., possession of the skills and knowledge to perform the service), (5) courtesy (e.g., politeness, respect, etc.), (6) credibility (e.g., trustworthiness), (7) security (e.g., free from risk or danger), (8) access (e.g., approachability), (9) communication (e.g., using nontechnical terms when talking to the consumer), and (10) understanding the

consumer (e.g., knowing what the customer needs and wants). Each of these factors relates to the customer's experiences and perceptions of service (Parasuraman, Berry, & Zeithaml, 1991).

This early research provided a basis for strategies important in the development of a philosophy of service quality. A criticism of this early research is that the unit of analysis was restricted to service quality as perceived by the customer and not on the conditions within an organization that are responsible for quality (Edvardsson & Gustavsson, 1991).

In the research literature on performance management, Komaki, Blood, and Holder (1980) and DeRosa (1987) published studies using self-monitoring to affect behaviors related to the quality of service. Komaki et al. (1980) used performance management to increase the quality of customer service in a fast food restaurant. In this study, employee behavior was reinforced by management (e.g., recognizing and praising employees) when it met quality service standards and by the customer (e.g., the customer providing a smile or "friendly response"). Additionally, each employee monitored, on a self-recording checklist, his/her own level of performance (e.g., talking with the customers, smiling, etc.). Over a three-month period, behaviors related to the quality of customer service increased, in some cases three times over baseline levels.

DeRosa (1987) evaluated the effectiveness of a waitperson's checklist and self-monitoring on performance. Although this study used feedback and goal setting, the emphasis was on maintenance of good waitperson's behavior through the use of a checklist filled out by individual waitpersons. A checklist describing 11 behaviors was developed after monitoring and interacting with exemplary waitpersons. After providing all waitpersons with the checklist and a short 20-minute training program,

the waitpersons were asked to check off the number of behaviors fulfilled at each table. Feedback and small goals were discussed at the end of the shift, and data were presented on the number of behaviors performed and dollars spent by each guest. The procedure resulted in an increase in both the percentage of "good waitperson" behavior and dollar sales per customer.

Patton et al. (1990) focused on food quality and used a multiple-baseline design to measure the effectiveness of salient antecedents, graphic feedback, and contingent (delayed) reinforcement in increasing the quality of food preparation. Their procedure involved identifying antecedent behaviors for final preparation of the food, providing positive social reinforcement at least twice a day, and daily public posting of graphs which reflected the progress made during the intervention. This intervention was effective in almost doubling the quality of food preparation over nonintervention procedures with a minimal response by management (i.e., calculating performance totals and maintaining a feedback system).

Komaki et al. (1980), DeRosa (1987), and Patton et al. (1990) showed how the combined use of self-checklists and goal setting, feedback, and reinforcement can have a positive effect on service quality without focusing on personality traits, employee selection strategies, or the dynamics of interpersonal interactions, which are likely to be costly and time-consuming strategies (Whitney & Stuenkel, 1989).

A common independent variable in the above studies and others concerned with increasing the quality of food and the service delivered to customers in restaurants (e.g., Goncalves, 1974; Johnson & Masotti, 1990; Lennox, 1981; Ralis & O'Brien, 1987) is the use of goal setting, feedback, and positive reinforcement in combination with self-monitoring/checklists. The empirical effectiveness of behavioral interventions using these independent variables and the relative ease of

their implementation is clearly shown in the performance management literature (Kopp, 1988; O'Hara, Johnson, & Beehr, 1985). However, a difference of opinion as to the "underlying mechanisms" accounting for self-monitoring reactivity (Nelson & Hayes, 1981), and lack of research on the use of self-monitoring alone in business and industry, suggests a need for further investigation.

Statement of Problem

The variables affecting the reactivity of self-monitoring are many and can be investigated directly. One area important to self-monitoring efficacy is whether or not external contingencies (e.g., management feedback) are necessary for long-term reactivity. A study designed using different levels of external contingencies (e.g., management feedback and self-monitoring vs self-monitoring alone) or different types of self-monitoring (e.g., mechanical inspection vs. nonmechanical inspection), would help to identify the effects of self-generated stimuli verses those delivered by others. An important area, identified by Kopp (1988), concerns whether changes from self-monitoring would occur without some type of direct reporting to another person (e.g., a therapist) or other type of reporting (e.g., graphing of the self-report). These and other questions justify further study in this area.

The present study examined the effects of a relatively non-intrusive self-monitoring intervention on the quality of food delivered to customers in a restaurant with and without direct external consequences or feedback. The effects of quality guarantees (checklists) completed by employees on their own work products were studied. Two types of quality guarantees were used: one required the employees to sign their names before delivering a product to a customer (nonfeedback intervention), while the other required the employee to anonymously indicate (i.e., check off a box)

that the product met the quality standards. Also, with the second quality guarantee, group quality results were posted for employees to review (feedback and external monitoring of performance). This addition to the literature may help in the development of non-intrusive, low maintenance, and low cost interventions and help to add information to research on variables responsible for the effects of self-monitoring.

METHOD

Subjects and Setting

Two specialty fast-food restaurants located in a Midwestern city of approximately 100,000 people served as the setting for the research. The restaurants were part of a nationwide corporation specializing in carryout pizza. Two work shifts were involved: morning and evening. Each worker was required to participate in the study, as it became part of normal operations at the restaurants. The subjects ranged from 16 to 23 years of age, with tenure at the restaurant ranging from 1 to 3 years.

Dependent Variable

The dependent variable was the number of quality errors per order. Each order was evaluated for quality errors by mystery shoppers. Mystery shoppers acted as normal customers who were trained in the quality specifications of the company, but unlike some regular customers, they did not call the restaurant back when their order was of poor quality. Each mystery shopper was given a quality aid to help identify errors objectively.

Mystery shoppers bought pizzas a minimum of three times each week in two restaurants and evaluated the pizzas according to the quality standards specified in the parent company's guidelines.

Figure 1 identifies each of the quality standards measured. For each order, each item could be marked correct or incorrect (note: each error could only occur once per order). Figure 1 also was the form that the mystery shoppers completed and returned to the experimenter after each order inspection. Quality was defined as

Restaurant: ____ #1 ____ #2

Cost of Order: _____

Date of purchase: _____ Time of purchase: _____

Comments:

Mystery Shoppers Initials: _____

Pizza # 1 Round or Square Large -- Med. -- Small

Description of Toppings: _____

QUALITY STANDARDS

	Yes/No
A) You were greeted in a friendly manner (e.g., Hello! Can I help you?).	_____
B) You had to wait 2 or less minutes to be helped.	_____
C) In your opinion, the restaurant appeared clean.	_____
D) The order was ready within 5 min. of said pick-up time.	_____
E) The correct amount was charged for the order.	_____
F) Coupons were attached to the order.	_____
G) The quality checklist was attached to the order and correct	_____
1A) All toppings were the correct type.	_____
1B) Special requests were followed (e.g., ordered raw tomatoes, crust flavored).	_____
2) The dimensions were correct (i.e., round/square).	_____
3) Order was of the correct size (e.g., medium/large).	_____
4) Each pizza should have the following number of slices.	
Small Medium Large	
Square 6 9 12	
Round 8 10 12	
Order had the respective number of slices.	_____
5) Pizza slices were all the same size (within 3/4 inch).	_____
To determine, put the smallest piece on top of the largest piece.	_____
6) All pizza slices were completely cut (i.e., all pieces would tear easily).	_____
7) There were no air bubbles over 1 inch in size.	_____
8) All slices have an even amount of toppings ordered	_____
(see picture for correct distribution)	_____
9A) Round Pizza Only	
The rim of crust around the pizza was symmetrical and toppings did not spill	_____
over the edges (see picture for example).	_____
9B) Square Pizza Only	
Edge of pizza was consistent throughout and toppings did not spill	_____
over the edges (see picture for example).	_____
10) Cheese had spots of light brown color (see picture for example).	_____
11) Pizza was not burnt.	_____
12) Pizza measured + or - 1/4 inch from highest to lowest point of outer crust.	_____
13) Middle dough was not undercooked (remove toppings to check).	_____

Figure 1. Quality Checklist.

timeliness of preparation, correct size, correct toppings, and cooked correctly (i.e., is the order over or under cooked?). Only quality standards listed in Figure 1 were measured.

Independent Variable

The independent variable involved application of a quality guarantee with (signature phase) and without (checkmark phase) the employee's signature (Figure 2 and Figure 3, respectively). This quality guarantee described company standards and served as a self-monitoring device to the employee regarding the extent to which an order met the standards. To determine whether or not these quality guarantees were being filled out correctly, the experimenter required that the mystery shoppers review the quality guarantees attached to their orders for errors (i.e., was the ticket signed, checked off, or attached to the order?), and record errors on the quality standards checklist (Figure 1). If the quality guarantee was not signed, checked off, or attached to the order by the employees, management was informed of this by the experimenter. At this point, the manager then told the employees that all orders needed to have a quality guarantee attached and asked that this be done.

In the checkmark phase, employees were assigned a numbered sequence of quality guarantees by the manager to provide anonymity between the customer and the worker, but to give the impression to the employee that management had the opportunity to monitor each employee's performance (external monitoring variable). Also during this phase, the experimenter provided the restaurant manager with an average quality score (the combined total scores from the mystery shopper's quality standards checklist for that week divided by the total number of orders measured) including a graph containing the individual scores from the mystery shopper's quality

"COMPANY LOGO"**QUALITY GUARANTEE**

To insure that each "Company Name" pizza is of the highest quality possible, we inspect each pizza for the following:

1. Golden Brown Crust, top, and bottom
2. Entire pizza thoroughly cooked
3. Correct toppings
4. Correct portions and even distribution of toppings
5. Correct size
6. Pizzas are either round or square, as ordered
7. Pizzas are cut thoroughly and evenly
8. Special request are followed (ex. party-cut, well done, prebaked, etc.)

I certify that these pizzas meet the above "Company Name" Quality Standards

If you have any questions or comments, please call our "Company Name" restaurant manager immediately, or call our business office between 9 am and 5 pm, Monday thru Friday, at ###-####.

Thank You
"Company Name"

Figure 2. Quality Guarantee for Employees, Signature Phase.

"COMPANY LOGO"

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_____ This check-mark certifies that this pizza meet the above quality standards of "Company Name." If you have any questions or comments, please call our restaurant manager immediately, or call our business office between 9 am and 5 pm Monday through Friday, at ###-####.

Thank You
"Company Name"

Figure 3. Quality Guarantee for Employees, Checkmark Phase.

standards checklist. This graph was posted above the employee time clock where the employees could review it (external feedback).

Management Instructions

Each restaurant manager was advised as to the purpose of the quality guarantees, and why they were being used by the area manager. The managers were told that the employee making the final check on the order was required to sign the quality guarantee or to sign out a sequence of quality guarantees to be checked off and attached to the order after he/she determined whether or not an order met the quality standards of the company. The manager was informed that, if an employee rejected an order for poor quality and the manager believed that the order should not be rejected, then the manager was to sign the quality guarantee or check it off (all rejected orders were checked by the manager). During the checkmark phase, each manager was instructed not to provide any reinforcing or punishing consequences (e.g., not to praise or reprimand the employees for either high or low data points) as a result of data graphed and reported by the experimenter.

Additionally, the manager showed employees how to use the quality guarantee and told them that each order was to be checked and, if it met the quality standards, a quality guarantee was to be attached to the order. If the order did not meet the quality standards, the employee was to reject the order and tell the manager that the order was being rejected. If the manager thought the order met the standards, he/she would tell the worker why it did and then fill out the quality guarantee him/herself. If the order did not meet the quality standards, the order was rejected and the manager told the employee who made the order what was wrong, or adjusted machinery (e.g., oven temperature) as necessary. At no time was any employee told that the store was being

monitored. Only the Vice President of operations knew that the restaurant was being monitored during baseline measurements.

Mystery Shoppers

Training

Mystery shoppers (observers) were trained in the quality standards of the parent company before they measured the quality of pizzas in the field. Training was conducted by the experimenter and a management representative of the restaurant, and consisted of the following:

1. Each mystery shopper was shown pizzas of varying quality according to the parent company's standards (according to the criteria in Figure 1) and was told why each pizza met these standards (i.e., quality errors were pointed out). Next, each shopper was shown how to identify these problems using their quality aids and how to score the order using the quality standards checklist.

2. Each mystery shopper was required to score six pizzas of varying quality and to score five of the six pizzas correctly before being permitted to score pizzas in the field. Shoppers were retrained until this criterion was met.

3. Each mystery shopper was given a quality aid to help score the pizzas, both in training and in the field. This aid consisted of detailed color photographs of pizzas that met and did not meet the quality standards listed in Figure 1 and a card that listed all the quality standards of the parent company.

Data Collection

After being trained, each mystery shopper performed the following duties throughout each phase of the intervention:

1. Each mystery shopper was assigned the restaurants from which to purchase pizzas a minimum of three times per week. A purchase consisted of phoning in an order (any size with at least two toppings), picking up the pizza at the time the order was to be finished, taking the order home, and evaluating the pizza according to the quality criteria. The mystery shopper then filled out the quality standards checklist which was picked up by the experimenter within 24 hours.

2. The reliability of mystery shopper reports was assessed for at least one pizza selected randomly once per week. Checks were done for 21% of the total observations and consisted of having the same order evaluated by two different mystery shoppers without either knowing the other's results. For this quality check, one shopper set a time to meet a second mystery shopper at a prearranged location, called in the order, and picked the order up. At the meeting, each reviewed the order separately without showing his/her results or communicating about the order until both forms were completed and put into an envelope and sealed. The envelope was then given to the experimenter within 24 hours for scoring. If agreement (i.e., the same score for each item on the checklist) was less than 90% (shopper 1's score divided by shopper 2's score), discrepancies were discussed by the experimenter with the two mystery shoppers and retraining was conducted.

Experimental Design

Baseline

During this phase, normal operating systems at the company were intact (i.e., the quality guarantee was not used). Mystery shoppers also were recording at this time and reporting to the researcher (unknown to any employee at either restaurant).

Signature Phase

During this phase, the quality guarantee was introduced by the manager (as described above) to the employees; the performance of each was checked to see if the quality guarantee was used appropriately (i.e., employees were asked if they knew what each statement meant and asked to identify the standards on a pizza). After an order was cooked and removed from the oven, the landing person, who packaged the order, checked the order's quality against the standards on the quality guarantee. If the landing person found that the order did not meet the quality standards on the quality checklist, he/she rejected the order and told the manager (see above for manager's response). If the order met the quality standards, the landing person signed the quality guarantee and packaged the order. The landing person then stapled the quality guarantee along with all "advertisement" coupons on the closed package. Mystery shoppers recorded quality during this time, using the same procedures as in the baseline phase and noted on the quality standards checklist whether or not the quality guarantee was attached to the order. Feedback data on performance were not provided at this time to store managers or employees.

Checkmark Phase

This phase was the same as the signature phase except each employee was assigned a pad of quality guarantees that were sequentially numbered (for management identification), and each quality guarantee was to be checked off rather than signed. Also during this phase, the experimenter provided the restaurant manager with an average quality score (the combined total scores from the mystery shoppers' quality standards checklists for that week divided by the total number of orders measured) including a graph containing the individual scores from the mystery shopper's quality

standards checklist. The graph and information describing frequent errors were posted above the employee time clock where the employees could review them. An example of this is presented in Figure 4.

Design

A multiple baseline design across restaurants was used. This consisted of the study being conducted in two different restaurants each having its own baseline and quality guarantee intervention phases. The baseline phase continued until stable data were observed for Restaurant 1 at which time intervention was initiated. After intervention data in Restaurant 1 were stable, and baseline data were stable in Restaurant 2, the intervention was initiated in Restaurant 2. The signature phase was initiated first in Restaurant 1, followed by the checkmark phase, while in Restaurant 2, the checkmark phase was initiated first, followed by the signature phase.

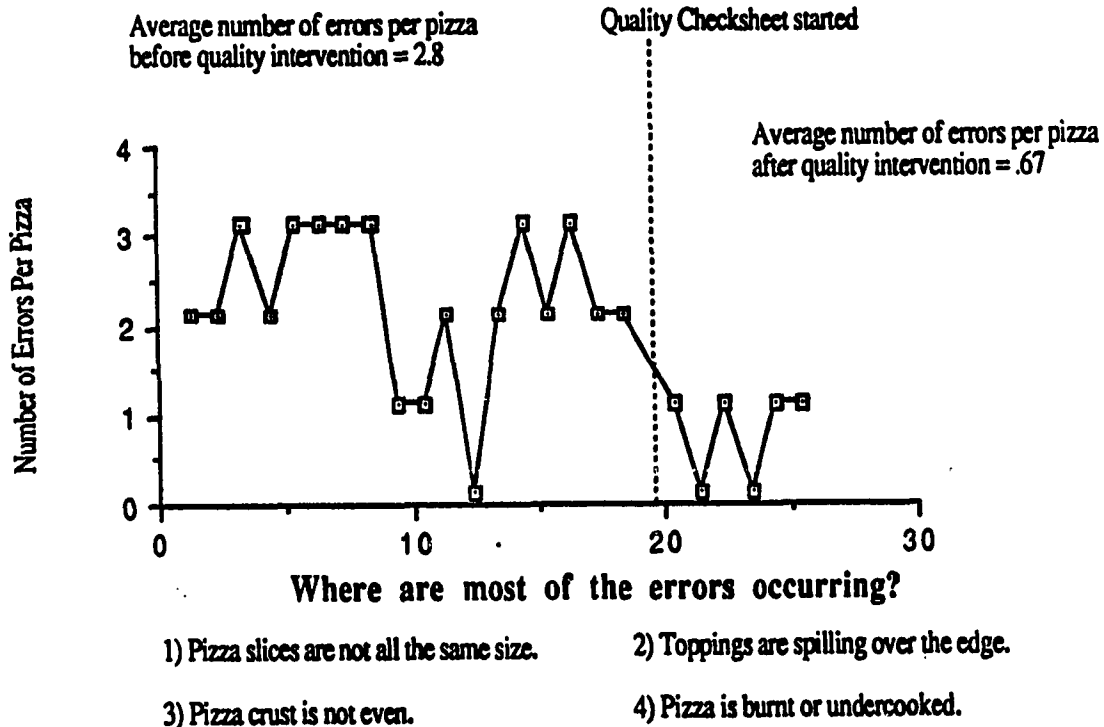


Figure 4. Weekly Mystery Shopper Graph.

Confidentiality, Benefits, and Risks

All information obtained during the study was recorded with the strictest confidentiality, and any reference to the company was in coded form. All information was stored at the researcher's office in a locked file cabinet and on a computer disk coded for restricted access. This research was designed to help the company to increase customer satisfaction by decreasing the number of quality errors per order delivered to the customer. This benefit came at no financial risk to the company, was implemented as part of normal operating procedures, and was of no physical or psychological risk to the company, its employees, or its customers. Finally, this project was approved by the Western Michigan University Human Subjects Institutional Review Board (see Appendix A).

RESULTS

All mystery shoppers met observer criteria (five of six orders scored correctly) during their first training period. Reliability checks (21% of all orders) showed a mean level of interobserver agreement of 95% for baseline, 98% for phase 1, 100% for phase 2, and an overall mean level of 98%. Reliability checks below 90% resulted in retraining of the mystery shoppers; this occurred once at the beginning of the study. Data were collected for a period of four months. Orders sampled by mystery shoppers totaled 126 for Restaurant #1 and 118 for Restaurant #2. Table 1 presents the means, standard deviations, and frequency of orders reviewed for each phase for Restaurant #1 and Restaurant #2.

Table 1

Means (M), Standard Deviations (SD), and Total Number of Errors (N) Per Order for Baseline, Signature, and Checkmark Phases for Restaurant #1 and Restaurant #2

	BASELINE	PHASE 1	PHASE 2
Restaurant #1		SIGNATURE	CHECKMARK
<u>M</u> (errors/order)	2.17	0.90	0.39
<u>SD</u>	0.86	0.93	0.50
<u>N</u>	18.00	90.00	18.00
Restaurant #2		CHECKMARK	SIGNATURE
<u>M</u> (errors/order)	2.13	0.84	0.56
<u>SD</u>	1.16	0.86	0.70
<u>N</u>	40.00	44.00	34.00

Figure 5 shows these data in graphic form. A review of these data revealed a lower error rate for the intervention phases when compared to the baseline phases for

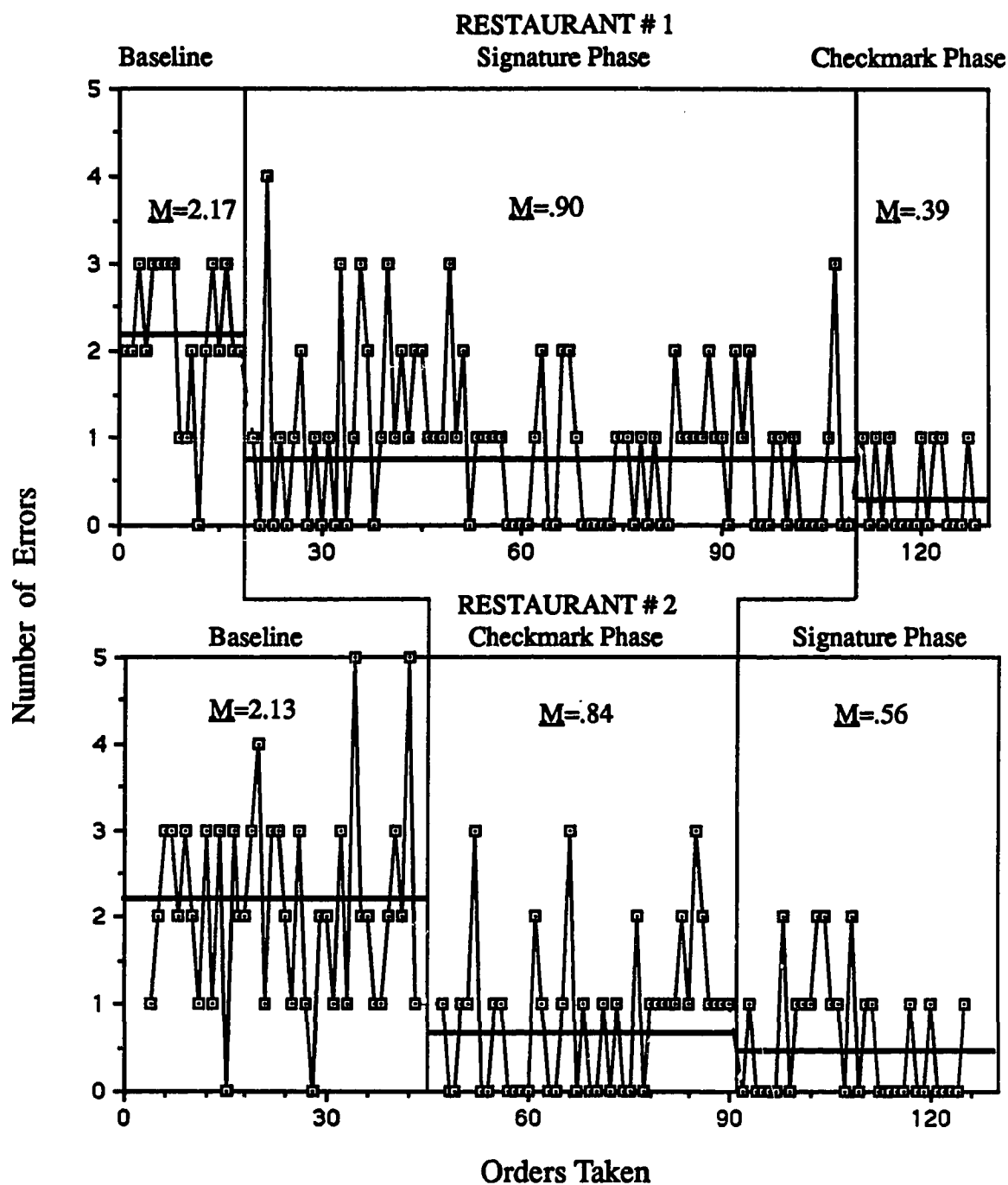


Figure 5. Number of Errors Per Order Sampled by Mystery Shoppers Taken for Restaurant #1 and Restaurant #2 for All Experimental Phases.

both restaurants. Restaurant #1 showed a decrease in errors over baseline data (mean = 2.17 per order), in the signature phase (mean = .90 per order), and in the checkmark phase (mean = .39 per order). Restaurant #2 showed a similar decrease in errors over baseline (mean = 2.13 per order), in the checkmark phase (mean = .84 per order), and in the signature phase (mean = .56 per order). Additionally, a decrease in errors between the first intervention phase and the second intervention phase can be seen in both restaurants with a mean decrease of .51 errors per order for Restaurant #1 and a mean decrease of .28 errors per order for Restaurant #2. A one factor ANOVA for repeated measures for Restaurant #1 showed a significant difference between baseline and phase 1 ($F = 18.048$; $p < .05$), between baseline and phase 2 ($F = 25.351$; $p < .05$), while there was not a significant difference between phase 1 and phase 2 ($F = .619$; $p > .05$). (Note: due to the large number of data points in phase 1, data were blocked and only the last 18 data points of each phase were used in performing the analysis for Restaurant #1). A one factor ANOVA for repeated measures for Restaurant #2 showed a significant difference between baseline and phase 1 ($F = 19.282$; $p < .05$), between baseline and phase 2 ($F = 22.782$; $p < .05$), while there was not a significant difference between phase 1 and phase 2 ($F = .146$; $p > .05$). (Note: all data points for all phases were used in performing the analysis for Restaurant #2). Figure 6 shows the cumulative number of error free orders for each phase. Restaurant #1 showed a total of 6% error free orders during baseline, in the signature phase a total of 39% error free orders, and in the checkmark phase a total of 61% error free orders. Restaurant #2 showed a total of 5% error free order during baseline, in the checkmark phase a total of 37% error free orders, and in the signature phase a total of 56% error free orders.

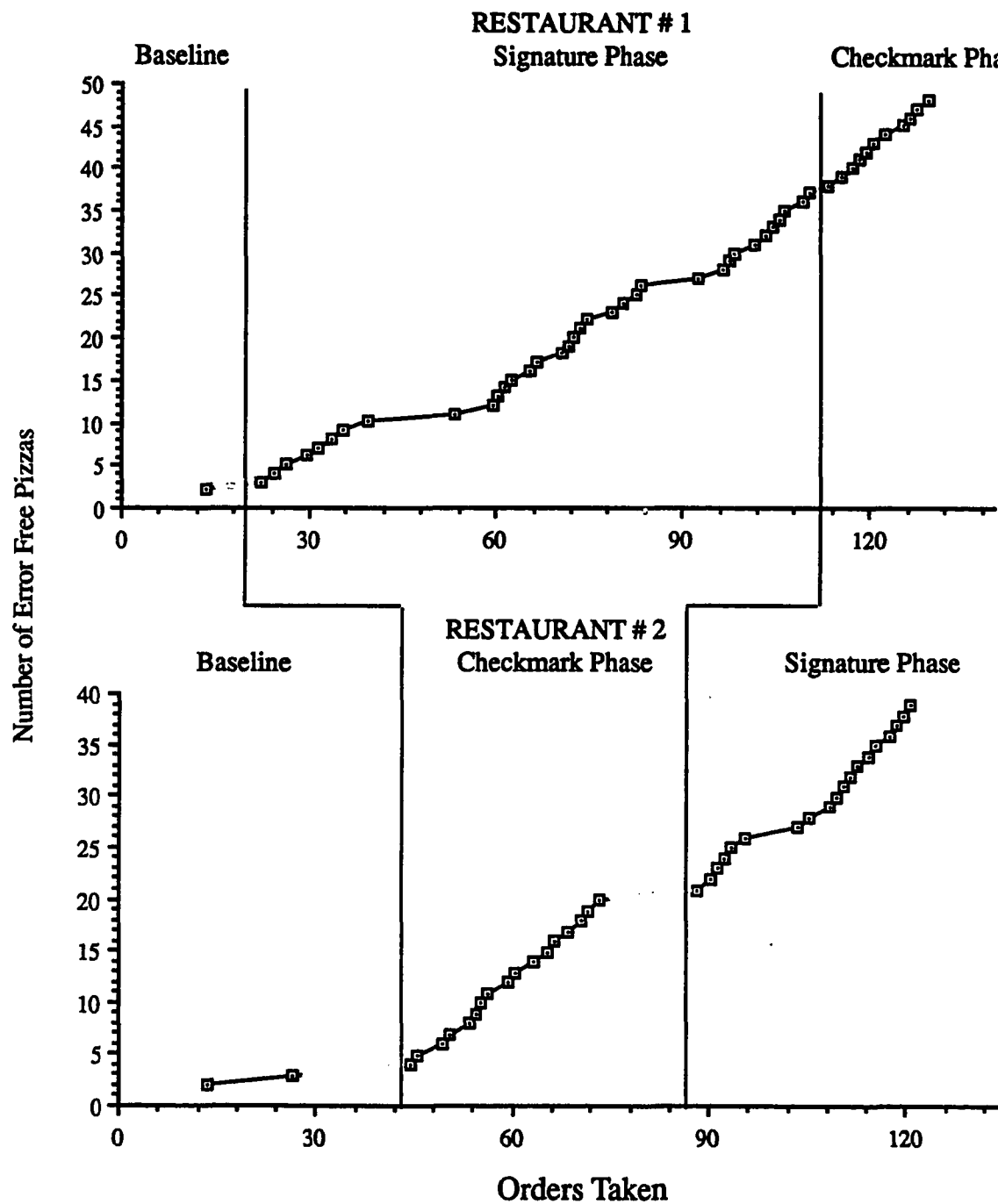


Figure 6. Cumulative Number of Error Free Orders Sampled by Mystery Shoppers Taken for Restaurant #1 and Restaurant #2 for All Experimental Phases.

Tables 2 and 3 present the means, standard deviations, and total number of errors per order for each checklist item for each phase for Restaurant #1 and Restaurant #2. Restaurant #1 showed a mean decrease in all criteria from baseline to the signature phase except in two areas: the crust thickness and whether or not the order was thoroughly cooked. These items showed a mean increase of 12 errors per 100 orders and 3 errors per 100 orders over baseline. The items decreased during the checkmark phase to 11 errors per 100 orders for the crust thickness and to 0.0 errors per 100 orders for whether or not the pizza was thoroughly cooked. All other items with a mean larger than 0.0 errors per 100 orders in baseline and the signature phase also decreased during the checkmark phase. There were no increases in any errors in the checkmark phase over either baseline or the signature phase for Restaurant #1. In reviewing the service items, a slight increase was noted during the signature phase (2.0 times per 100 orders) for the number of times a mystery shopper had to wait two or more minutes for their order. The quality guarantee was not attached to the order 18 times during the signature phase, while all orders had the quality guarantee attached during the checkmark phase. The employees reported that it was too cumbersome to sign their names to the quality guarantee during busy periods and therefore did not attach them.

Restaurant #2 showed a mean increase in errors from baseline to the checkmark phase in all except three areas: consistency of the crust edge, over-cooking, and the crust thickness. The mean increase in errors for consistency of crust edge and over-cooking was 2.0 errors per 100 orders and 1.0 errors per 100 orders. Crust thickness showed a mean increase of 16 errors per 100 orders during the checkmark phase. As with Restaurant #1, these and all other items decreased during the signature phase except for the evenness of the toppings which increased from a mean of 2 errors

Table 2

Means, Standard Deviations, and Total Number of Errors per Order for Each Checklist Item per Phase for Restaurant #1

	BASELINE			PHASE 1 SIGNATURE			PHASE 2 CHECKMARK		
	M	SD	# Errors	M	SD	# Errors	M	SD	# Errors
Toppings were the correct type	0.11	0.32	2	0.01	0.11	1	0.00	0.00	0
Special requests were followed	0.28	0.46	5	0.06	0.23	5	0.00	0.00	0
Dimensions were correct	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0
Order was of the correct size	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0
Correct number of slices	0.06	0.24	1	0.02	0.15	2	0.00	0.00	0
Slices were all the same size	0.44	0.51	8	0.28	0.45	25	0.17	0.38	3
Slices were completely cut	0.17	0.38	3	0.01	0.11	1	0.00	0.00	0
No air bubbles over 1 inch in size	0.17	0.38	3	0.14	0.35	13	0.11	0.32	2
Even amount of toppings ordered	0.56	0.51	10	0.13	0.34	12	0.00	0.00	0
Toppings did not spill over edge	0.11	0.32	2	0.02	0.15	2	0.00	0.00	0
Edge of pizza was consistent	0.11	0.32	2	0.02	0.15	2	0.00	0.00	0
Cheese had spots of light brown	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0
Pizza was not burnt	0.17	0.38	3	0.04	0.21	4	0.00	0.00	0
Pizza measured + or - 1/4 inch	0.00	0.00	0	0.12	0.33	11	0.11	0.32	2
Middle dough was not undercooked	0.00	0.00	0	0.03	0.18	3	0.00	0.00	0
<u>SERVICE</u>									
Greeted in a friendly manner	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0
Waited 2 or less minutes	0.00	0.00	0	0.02	0.15	2	0.00	0.00	0
Restaurant appeared clean	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0
Order was ready within 5 min.	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0
Correct amount was charged	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0
Coupons were attached to the order	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0
Quality checklist was attached			N/A	0.20	0.40	18	0.00	0.00	0

Table 3

Means, Standard Deviations, and Total Number of Errors per Order for Each Checklist Item per Phase for Restaurant #2

	BASELINE			PHASE 1 CHECKMARK			PHASE 2 SIGNATURE		
	M	SD	# Errors	M	SD	# Errors	M	SD	# Errors
Toppings were the correct type	0.05	0.22	2	0.00	0.00	0	0.00	0.00	0
Special requests were followed	0.08	0.27	3	0.00	0.00	0	0.00	0.00	0
Dimensions were correct	0.03	0.16	1	0.00	0.00	0	0.00	0.00	0
Order was of the correct size	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0
Correct number of slices	0.08	0.27	3	0.00	0.00	0	0.00	0.00	0
Slices were all the same size	0.65	0.48	26	0.36	0.49	16	0.15	0.36	5
Slices were completely cut	0.18	0.39	7	0.00	0.00	0	0.00	0.00	0
No air bubbles over 1 inch in size	0.25	0.44	10	0.09	0.29	4	0.03	0.17	1
Even amount of toppings ordered	0.45	0.50	18	0.02	0.15	1	0.24	0.43	8
Toppings did not spill over edge	0.08	0.27	3	0.00	0.00	0	0.00	0.00	0
Edge of pizza was consistent	0.03	0.16	1	0.05	0.21	2	0.00	0.00	0
Cheese had spots of light brown	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0
Pizza was not burnt	0.10	0.30	4	0.11	0.32	5	0.03	0.17	1
Pizza measured + or - 1/4 inch	0.00	0.00	0	0.16	0.37	7	0.12	0.33	4
Middle dough was not undercooked	0.15	0.36	6	0.05	0.21	2	0.00	0.00	0
<u>SERVICE</u>									
Greeted in a friendly manner	0.05	0.22	2	0.00	0.00	0	0.00	0.00	0
Waited 2 or less minutes	0.03	0.16	1	0.00	0.00	0	0.00	0.00	0
Restaurant appeared clean	0.10	0.30	4	0.00	0.00	0	0.00	0.00	0
Order was ready within 5 min.	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0
Correct amount was charged	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0
Coupons were attached to the order	0.03	0.16	1	0.00	0.00	0	0.03	0.17	1
Quality checklist was attached			N/A	0.14	0.35	6	0.18	0.39	6

per 100 orders during the checkmark phase to a mean of 24 errors per 100 orders during the signature phase (the baseline mean for this item was 45 errors per 100 orders). There were no increases in any errors in the signature phase over baseline for Restaurant #2. In reviewing the service items, there was a decrease in all errors with a mean greater than 0.0 errors per 100 orders during the checkmark phase over baseline and no increases in service errors during the signature phase over baseline. The quality guarantee was not attached to orders 6 times during the checkmark phase and 6 times during the signature phase. The employees reported that they did not attach the quality guarantee during the checkmark phase because they forgot, whereas they reported they did not attach the quality guarantee during the signature phase because it was more cumbersome to sign their names than to check off the quality guarantee.

In summary, the results suggest that self-monitoring was effective in decreasing error rates in service quality, although there does not appear to be a difference in effects resulting from requiring a worker to sign their name to a quality guarantee and those requiring an anonymous indication (as seen by the customer) that the order met the quality standards.

DISCUSSION

The present experiment was designed to investigate whether self-monitoring without management-provided contingencies (e.g., reinforcing or punishing worker's behavior) and/or management provided feedback was an effective intervention in increasing service quality (i.e., reducing the number of quality errors per order) in a carryout pizza restaurant. The data suggest that self-monitoring without externally provided consequences and/or feedback was as effective as self-monitoring with group feedback. These data seem to contradict the findings of previous studies (Nelson & Hayes, 1981; Rachlin, 1974) which showed that self-monitoring alone was not sufficient to produce changes in response frequency. This is important, because feedback relies heavily on the cooperation of another person for monitoring, recording, and delivery of the appropriate consequences, a process which could be time consuming and expensive. Nelson (1977) suggests that reactive effects, similar to those seen in this experiment, could be the result of implicit or explicit demands to produce differential behavior change by management. These demands could have been inferred from instructions given by management to the employees on how to use the quality checklist.

The data suggest self-monitoring alone can be used as an effective tool in increasing worker performance; other studies show that when used with feedback, it can be as effective as other more complex and time consuming interventions (Krigsman & O'Brien, 1987). Krigsman and O'Brien (1987), in testing the efficacy of a self-monitoring and feedback intervention against an established quality circle program, found that the simpler self-monitoring intervention produced equal if not

superior immediate effects on performance. Their study consisted of comparing two similar plants, one in Chicago and one in Barceloneta, Puerto Rico. In the Chicago plant, employees were assigned to a standard quality circle (QC) which chose to work on the loss of sausage casing clips. The QC developed a self-monitoring system to solve this production problem. The self-monitoring system consisted of weighing and recording available clip supply at the beginning and end of each shift. These data were then conveyed to other members of the shift and posted publicly (feedback). The self-monitoring/feedback intervention was first implemented in the Chicago plant where it was developed, and one year later in the Barceloneta plant without a QC program. Using the previous year's data from the QC group in Chicago as a comparison, clip loss results showed that the initial effect on the workers in the QC and those using self-monitoring were equal.

Komaki et al. (1980) used self-monitoring to increase the quality of customer service in a fast food restaurant. In this study, employee behavior was reinforced by management when it met quality service standards. Additionally, each employee, monitored on a self-recording checklist his/her own level of performance (e.g., talking with the customers, smiling, etc.). Over a three month period, behaviors related to the quality of customer service increased, in some cases three times over baseline levels. The results from Kringsman and O'Brien (1987), Komaki et al. (1980), and those from the present study, suggest that self-monitoring is a viable cost- and time-effective intervention in both service and manufacturing industries.

The extent to which there is a difference between self-monitoring with and without monitoring/feedback by management is not clear from the present data. Though both interventions showed an equal decrease in errors over baseline, no significant differences were noted between the two interventions. This ambiguity

could be the result of: the total frequency of errors per order (e.g., .39 and .56 for the last phases in restaurant #1 and #2, respectively) being too small to be affected further by either intervention (Nelson & Hayes, 1981) and/or a lack of effects of the self-monitoring behavior itself (i.e., the workers may have just signed or checked off the quality guarantee and attached it to the order without checking the order very accurately, resulting in undetected errors on orders being delivered to the customer). Bennett (1988) suggests that the immediate improvement such as that seen between the baseline phases and phase 1 could have resulted from an instructional effect of self-monitoring devices. That is, the employees learned to correctly perform the necessary tasks to immediately correct errors once the checklists were introduced.

Self-monitoring or the lack of self-monitoring (i.e., signing or checking off the checksheet without checking every order) may have occurred as this was not monitored after the first training session between the manager and the employee. As noted above, both restaurants reported that the checkmark quality guarantee was much easier to use during busy periods than the signature quality guarantee. This might explain why four times more orders were processed without the signature quality guarantee than the checkmark quality guarantee. Nelson (1977) reported that this "economy of use" may affect the reliability of self-monitoring. If the behavior is of high-frequency (as during busy periods) or the self-recording device is inaccessible or obtrusive, the subject may discriminate the behavior, but fail to make the self-recording response or record a response only intermittently (McFall, 1977; Nelson, 1977; Nelson & Hayes, 1981).

Variables (identified by McFall, 1977 and Nelson, 1977) that may influence the occurrence and magnitude of the effects of self-monitoring include: (a) motivation: subjects who volunteer or want to change their behavior show increased reactive

effects, while subjects who are not necessarily motivated to change may actually react negatively (e.g., a relatively neutral behavior, once monitored may increase or decrease in an unwanted direction); (b) valence: reportedly positive behaviors are likely to increase, negative behaviors are likely to decrease, and neutral behaviors are likely to remain the same; (c) target behaviors: target behaviors that are nonverbal versus verbal are more likely to change (the self-monitored behavior is also more likely to change when the behavior as well as variables affecting the behavior are monitored); (d) goals, reinforcement, and feedback: when goals are set or reinforcement and feedback are provided, reactivity, especially with discreet behaviors, is more likely to occur; (e) self-monitoring devices: the more salient the self-monitoring device, the more discriminative control the device has over the monitoring of the behavior; (f) number of target behaviors: self-monitoring shows greater effects when only one behavior is being monitored as compared to two or more behaviors; (g) schedule of self-monitoring: behaviors that are continuously recorded result in greater change than behaviors that are recorded only intermittently or in time blocks; and (h) self-monitoring instructions: as noted above, implicit or explicit demands on performance may result in behavior change. Also, differential instructions (e.g., to increase, decrease, or not to change the behavior) may result in behavior change. Though these factors result in different effects on self-monitoring, the key factor is whether or not the behavior change is enough to result in a positive or desired effect and the maintenance of that behavior.

Another variable that may have limited the differential effects of the two interventions was the lack of immediate individual feedback with goals and reinforcement as compared to the weekly group feedback that was provided during the checkmark phase. With group feedback, performance of individuals is not reported

or may not be understood by the worker. Group feedback ignores individual behaviors and reactions (Nordstrom et al. 1990). For example, although the graphs in the current study listed the mean number of errors per order for the current week and errors that were occurring most often, it was difficult for an individual employee to evaluate his or her performance relative to the group.

It is also conceivable that the feedback data provided little useful information to employees. Henry and Redmon (1990) suggest that individual feedback describing specific behaviors to increase performance is more effective in changing behavior than summary data that list only general problem areas (e.g., pizza had slices ranging from 1 inch in size to 6 inches in size versus pizza slices were not all the same size). The addition of goal setting and reinforcement to the checkmark phase might have provided more useful information relative to the signature phase. For example, Ralis and O'Brien (1987) used prompts, goal-setting, feedback, and praise to increase red and white wine sales in a large suburban restaurant. Results showed a significant overall increase in both red and white wine sales when goal setting was combined with feedback, and praise. Without receiving guidance through goal setting it is difficult for food service employees to determine specifically what to do to produce high quality work (Patton et al. 1990).

One might argue that the observed increases in the present study were not meaningful in a practical sense. However, the efficacy of this study is evident in the ease of application, relatively low cost (approximately \$60.00 for production of the quality guarantees over a three month period), and overall decrease in quality errors. Quality service and improvement is especially important where the competition for customers is high and restaurants and fast-food chains which produce quality service are more likely to prosper (Patton et al. 1990).

The carry-out "pizza" business is not the only one that might benefit from a cost-effective self-monitoring quality device. Service businesses that provide a product or service that requires checking (both before and after) a number of dimensions or characteristics could benefit as well. For example, auto mechanics could use a self-monitoring checklist that would help them obtain the correct tools and equipment needed before starting a particular job. Additionally, mechanics could use a similar self-monitoring checklist and individual feedback to be sure all tasks were correctly performed after the job was completed. Such actions might decrease the chances of having to stop a job to get a required piece of equipment or tool or having the customer return the car because the mechanic failed to perform a task properly. Other areas that might benefit by using self-monitoring interventions are preventive maintenance, inventory control, and financial activities (DeRosa, 1980).

A weakness of the present study was the lack of data on customer satisfaction. Although there was an overall increase in quality, was this quality noticeable by the average customer? Did the quality guarantee result in increased customer satisfaction? Currently, customers call back a complaint and, if it is deemed severe enough by the manager, the customer is offered a discount on the next order. These data are also taken at the main office, where reports are not always sent back to the restaurant where the error occurred. Two approaches to correct this problem could have been developed: (1) customer feedback cards on discount coupons could have been used so that a larger sample of customers would provide feedback, both positive and negative; and (2) a systematic customer questionnaire could be used to assess satisfaction on a regular basis. In the first case, customer feedback cards on discount coupons could have been provided with the orders which could be used on the next order. However, like the current procedure, the validity of customer complaints may

be limited by sampling error that may occur from the number of customers who generally complain (Chase & Bowen, 1991). In the second case, a random sample of customers could have been telephoned a short period after they picked up their order and asked questions relating to their service experience. These results could have then been compared to the quality data to determine whether or not a positive correlation existed between the changes in the product and customer satisfaction.

In conclusion, the overall results from the self-monitoring intervention encourage its use in improving service quality in a take-out restaurant. Future research should focus on the cost effectiveness of self-monitoring without feedback versus self-monitoring with individual feedback. Another area that might be investigated would be a quality checklist that is filled out from the start to the finish of an order versus only a final check for quality. Each stage of the preparation process would require the person performing the task to sign or check off a self-monitoring checklist as compared to only a final inspection. This research could help to determine the limits of self-monitoring in the restaurant industry.

Appendix A
Human Subjects Institutional Review Board Approval

Human Subjects Institutional Review Board



Kalamazoo, Michigan 49008-3899

WESTERN MICHIGAN UNIVERSITY

Date: October 3, 1990**To:** John P. McDonough III**From:** Mary Anne Bunda, Chair**Re:** HSIRB Project Number: 90-10-03*Mary Anne Bunda*

This letter will serve as confirmation that your research protocol, "Improving Quality Through Self-Monitoring," has been approved under the exempt category of review by the HSIRB. However, I would like to clarify that my position is that the subjects of the experiment are actually the restaurants in question since the ratings provided by the mystery shoppers go well beyond behaviors under the control of the current employees of the restaurant. Consequently, those employees do not have to sign consent forms. An additional protection of the employees is their total anonymity from the researcher.

The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the approval application. You must seek reapproval for any changes in this design. You must also seek reapproval if the project extends beyond the termination date.

Best of luck with your endeavors.

xc: William Redmon, Psychology

Approval Termination: October 3, 1991

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