



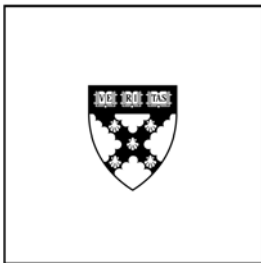
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Creating Reciprocal Value Through Operational Transparency

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Creating Reciprocal Value Through Operational Transparency

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Creating Reciprocal Value Through Operational Transparency

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We investigate whether organizations can create value by introducing visual transparency between consumers and producers. Although existing theory posits that increased contact between the two parties can diminish work performance, we conducted two field and two laboratory experiments in food service contexts that suggest that the introduction of operational transparency improves service quality and efficiency. The introduction of reciprocal operational transparency contributed to a 17.3% increase in customer-reported quality and reduced throughput times by 13.2%. Customers who observed employees engaged in labor perceived greater effort, appreciated that effort, and valued the service more. Employees who observed customers felt more appreciated, and in turn, were more satisfied with their work and exerted increased levels of effort. We find that transparency, by visually revealing operating processes to both producers and consumers, generates a positive feedback loop through which value is created for both parties.

Key words: operational transparency; service quality; efficiency; customers; employees

1. Introduction

From parents packing lunches for their children to factory workers toiling on assembly lines, we spend a great deal of our lives working in service of others. In 2012, for example, employed Americans spent 58.1% of their waking workdays at their jobs, volunteering, or caring for other people (U.S. Census Bureau and Bureau of Economic Analysis 2013). Our labor is a part of a constant social process in which we work reciprocally on each other's behalf. Yet despite this interconnectivity, our labor is becoming less and less interactive. We rarely observe the beneficiaries of our own efforts, nor do we observe and appreciate the people and processes that create the products and services we enjoy. Globalization and advances in automation exacerbate this trend; by some accounts, as many as 60% of the products we buy are produced overseas (ABC News 2011), and technology, rather than people, mediates a growing share of our service interactions (Meuter et al. 2000). Does this separation between producers and consumers pose hidden costs, and if so, for whom?

Recent studies have begun to tackle the effects of *operational transparency*, which describes how operating processes are revealed to consumers (Buell and Norton 2011, 2013). A growing body of experimental research documents the perceptual benefits of showing customers the work conducted on their behalf during service transactions. Revealing the delivery process can improve perceptions of the service provider and of the experience (Buell and Norton 2011, Mohr and Bitner 1995, Morales 2005). An understanding of the time and effort involved can enhance perceptions of outcome quality (Chinander and Schweitzer 2003, Kruger et al. 2004); moreover, visual information can influence and even dominate more relevant metrics of quality (Ambady and Rosenthal 1993, Benjamin and Shapiro 2009, Rule and Ambady 2008, Tsay 2013, 2014).

While transparency may enhance consumer perceptions, a longstanding tenet of operations theory is that contact between consumers and producers diminishes efficiency and production performance (Chase 1978, 1981). Accordingly, organizations often aim to buffer their core processes from such environmental disturbances (Thompson, 1967) and to assert greater control over the process when consumers are likely to introduce uncertainties (Tansik and Chase 1983). Furthermore, transparency can reduce efficiency by inducing workers to revert to codified but less effective practices (Bernstein 2012), and disrespectful interactions may demotivate workers, undermining their engagement and job performance (Grandey et al. 2004). More recent research suggests that these findings are equivocal; when provided with opportunities for respectful contact with the beneficiaries of their efforts, workers may experience prolonged motivation (Grant et al. 2007), and feel empowered and more satisfied with their jobs (Hartline and Ferrell 1996, Snipes et al. 2005).

The current experiments, conducted with customers and employees in food service contexts, serve as the first empirical investigations that support the notion that operational transparency, in the form of access to visual information about service processes, improves both service quality and efficiency. While other work has hinted at ways in which operational transparency could promote positive subjective experiences for *consumers*, we find that transparency introduces the possibility of *reciprocal* gains (Cialdini 2009, Regan 1971, Tidd and Lockard 1978) for both consumers and producers: more positive interactions, greater worker satisfaction, and higher levels of both *perceived* and *actual* work performance. Furthermore, our work highlights the ways in which having reciprocal access to visual information - through operational transparency - generates a positive feedback loop through which value is created for producers and consumers alike. These findings hold particular promise as significant value may be created and captured collectively, without requiring extensive investments or adjustments to existing operating systems, and without incurring the individual and organizational costs often associated with traditional monitoring strategies and training programs.

2. Presentation of experiments

In four experiments, including two conducted in the field and two conducted in the lab, we investigate the effect of operational transparency on customer perceptions, employee behaviors and motivation, and actual outcomes in face-to-face service settings. In particular, we focus on the food service industry, which was a \$2.55 trillion business worldwide in 2012 (Johnson School and Gerson Lehrman Group 2012), and in 2014 is projected to total \$683 billion in sales in the United States alone (4% of the country’s Gross Domestic Product) and employ more than 13.5 million people (National Restaurant Association 2014). As in many face-to-face service settings, in food service, customers and employees are proximate and work is performed on each customer’s behalf. While that work is not inherently unappealing, it is often conducted in isolation. This presents an opportunity to explore how operational transparency affects and can add value to a broad array of important service outcomes.

In a field experiment conducted in a university dining hall, we demonstrate that the introduction of reciprocal operational transparency, which enabled customers and chefs to see one another during the service process, improved customer perceptions of service value and ratings of food quality without affecting employee performance consistency and in fact reducing throughput time (Experiment 1). A subsequent field study, conducted at a different dining hall with a more heterogeneous population, provides converging evidence of the distinct positive effects of operational transparency on perceived and objective quality. We next turn to a pair of laboratory experiments that illustrates the mechanisms underlying the effects for customers and employees. For customers, operational transparency increases perceptions of effort that lead the customer to feel more appreciative of the employee and thus perceive the service as more valuable (Experiment 2). For employees, seeing the customer made them feel more appreciated, which increased both job satisfaction and intended levels of effort (Experiment 3).

2.1. Experiment 1: Effects on customers and employees

In Experiment 1, we test the effects of operational transparency on the quality and efficiency of service delivered by chefs in a university dining hall (100% male; $M_{age} = 47.83$, $SD = 11.58$), as well as on the service value perceptions of their customers. We surveyed 328 customers (40.1% female; $M_{age} = 21.04$, $SD = 4.81$) who ordered food from the dining hall grill station over a two-week period. The station offered made-to-order items, which were cooked in a kitchen area separated from the dining hall by an opaque wall. We manipulated operational transparency by installing a pair of iPads with video conferencing software: one in the kitchen in view of the chefs, and another by the order submission station in view of the customers. No sound was provided through either iPad, a design that ensured that only visual information was available to customers and

employees without the possible effects of dyadic interactions or of information conveyed through other modalities (Tsay 2013, 2014). By installing these silent “virtual windows,” we were able to investigate the directional effects of operational transparency in a 2 (customers: observe, do not observe the chefs) \times 2 (chefs: observe, do not observe the customers) experimental design. As only 18.3% of customers surveyed had noticed the presence of the iPads, the double blind condition is likely to reflect the true baseline prior to the iPad installation. Conditions were enacted iteratively and cumulatively, with their presentation counterbalanced over two weeks and across two sets of staff, with a rehabilitation period in the middle of the experiment (**Figure 1**).

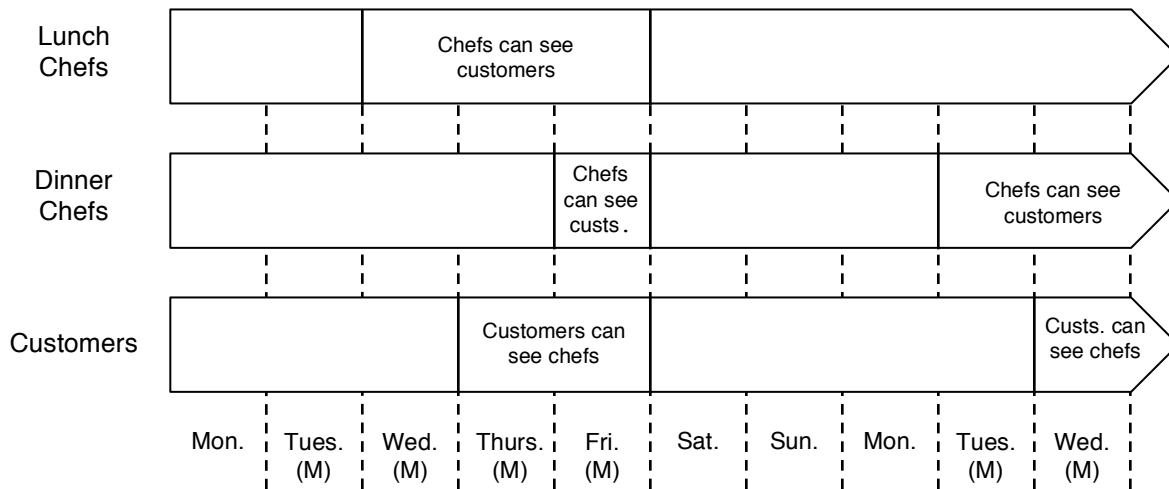


Figure 1 Design of field experiment. M indicates days when chef behaviors and customer perceptions were measured (Experiment 1).

We measured the effects of transparency on employees in two ways. First, we used customers’ satisfaction with the food they ordered from the grill - “On a scale of 1 to 7, how satisfied are you with today’s orders?” - as a measure of user-based quality (Edwards 1968, Garvin 1984, Gilmore 1974). We also measured the production throughput time, or the start to finish preparation time, of randomly selected grill items prepared by each chef. This was used to assess the efficiency and consistency of employee performance.¹ Data from these quality measures should hold generalizable implications across a range of domains, including banking (Walfried et al. 2000), education (Jacob

¹ We note that all of the employees who delivered service during this experiment were male. While this fact does not allow us to test whether the effects of transparency on employees varies across genders, it does enable us to rule out homophily as an explanation for our results. In particular, all main effects held after controlling for the gender of the customer. Furthermore, we note that the effects that we attribute to transparency in this study are distinct from the effects of observation. In particular, the research assistant who observed and recorded the process from inside the kitchen throughout the experiment was introduced before baseline measurements were taken, as were the research assistants who distributed and collected surveys in the dining hall. Hence, the effects attributed to our experimental manipulations are over and above any effect of having extra observers present in the kitchen. Finally, all research assistants involved in this study were blind to the hypotheses.

and Lefgren 2008), healthcare (Chassin and Galvin 1998, Jha 2006), service (Cronin Jr. and Taylor 1992), technology (Crowston et al. 2006), and the public sector (Rusbult 1979).

A univariate analysis of variance (ANOVA) revealed one main effect: chefs who saw the customers produce food that led to significantly higher customer satisfaction ($M = 5.32$, $SD = 0.12$), compared to chefs who did not see the customers ($M = 4.78$, $SD = 0.13$), $F(1, 320) = 10.19$, $P < 0.01$. When neither the chef nor the customer could see one another, food satisfaction was at its lowest ($M = 4.68$, $SD = 1.48$). When we introduced transparency only for chefs, so that they could see the customers but customers could not see them, food satisfaction still increased significantly ($M = 5.15$, $SD = 1.23$), $t(169) = 2.54$, $P < 0.05$. We note that nothing had changed from the customers' point of view; customers were unaware that chefs could see them, while chefs were aware of this visual asymmetry. Thus, we attribute this observed 10% increase in satisfaction to an objective improvement in employee performance. When visuals were available so that customers saw chefs who could not see them ($M = 4.87$, $SD = 1.58$), food satisfaction was no different from the baseline, $t(154) = -0.68$, $P = NS$. Most importantly, when we introduced reciprocal transparency so that both customers and chefs could see one another, food satisfaction was at its highest ($M = 5.49$, $SD = 1.41$), at 17.3% above the baseline, $t(217) = 4.13$, $P < 0.01$ (**Figure 2**). It is unlikely that these effects were due to deliberate observation processes that involved conscious attention, as customers typically proceeded into other areas of the dining hall after ordering, and as chefs typically prepared orders for multiple customers simultaneously.

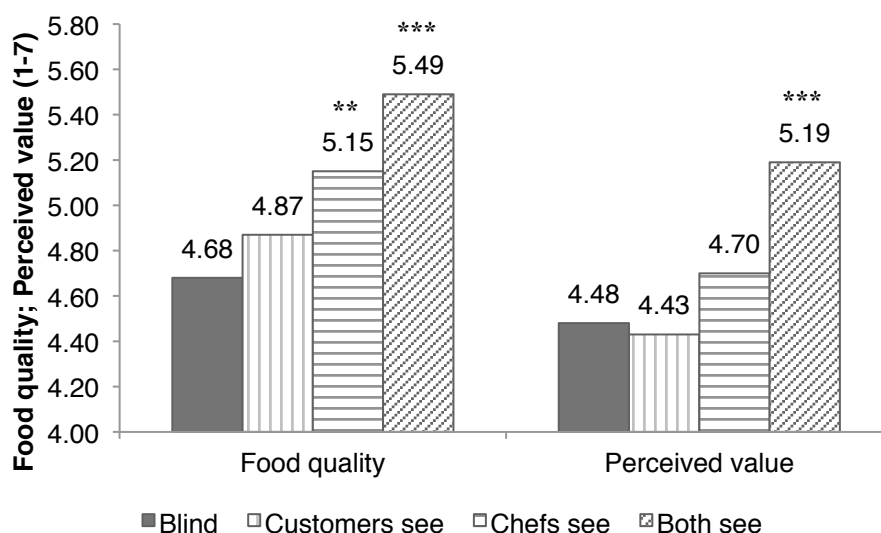


Figure 2 Operational transparency increases the perceived value of the service process and the quality of food produced ($N = 328$). Perceived value and food quality are highest when customers and employees can see each other (Experiment 1). *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively, relative to the baseline double blind condition.

Do these quality gains come at the expense of efficiency? To find out, a research assistant who was stationed in the kitchen recorded the throughput times of randomly selected grill order items prepared by each chef ($N = 589$). Relative to the baseline condition when neither employees nor customers could see their counterparts, after controlling for meal (i.e., lunch or dinner) and item prepared, average throughput time for orders was slower when chefs could see the customers ($\beta = 9.89$, $P < 0.01$), with items being prepared at an average of 115.7% of standard time. However, contrary to standing operations theory, when both chefs and customers could see each other, throughput times were actually faster than those in the baseline condition ($\beta = -8.33$, $P < 0.01$), with items being prepared at an average of 86.8% of standard time. Allowing customers to see the chefs did not have a significant effect on average throughput time relative to the baseline ($\beta = -3.12$, $P = NS$), with items prepared at an average of 95.0% of standard time. Furthermore, the consistency of employee performance, measured as the absolute value of the z-score for each item prepared by a specific chef in a given meal, was unaffected by the introduction of operational transparency ($P = NS$).

These results suggest that the quality improvements brought about by operational transparency need not jeopardize the responsiveness or consistency of the operating system. In fact, under reciprocal transparency, when quality ratings are at their highest, we find that responsiveness actually improved (**Table 1**). In these conditions, employees were observed being more conscientious about processing orders when they arrived and were less likely to overcook items than in the baseline condition.

We further investigated whether customer perceptions of service value are affected by operational transparency. These perceptions are important predictors of longer-term behaviors, such as willingness to pay, satisfaction, and loyalty (McDougall and Levesque 2000). We measured them using the following adapted four-item scale: “The grill station provides a service I want to use,” “The grill station offers a high quality service,” “Other people would approve of the grill station,” and “I am willing to pay to use the grill station.” Participants provided responses on a 7-point scale, and we averaged these four items to create a composite measure of perceived service value ($\alpha = 0.70$) (Sweeney and Soutar 2001). A univariate ANOVA revealed one main effect and one interaction. Consistent with the findings on customer satisfaction with food, customer perceptions of service value were higher when chefs could observe the customers ($M = 4.95$, $SD = 0.10$) than when they could not ($M = 4.46$, $SD = 0.10$), $F(1, 324) = 14.37$, $P < 0.01$. Furthermore, there was a significant interaction between chefs seeing the customers and customers seeing the chefs, $F(1, 155) = 7.31$, $P < 0.05$. Specifically, when chefs could not observe customers, value perceptions were statistically indistinguishable in the absence ($M = 4.48$, $SD = 1.48$) or presence ($M = 4.43$, $SD = 1.13$), $t(155) = 0.37$, $P = NS$, of transparency for customers. These results parallel the results for quality.

	(1)	(2)	(3)	(4)	(5)
	Throughput time	Consistency	Food Satisfaction	Perceived Value	Perceived Value
Chef Transparency	9.894*** (3.453)	0.004 (0.082)	0.465** (0.229)	0.204 (0.172)	-0.009 (0.132)
Customer Transparency	-3.118 (4.119)	-0.040 (0.098)	0.182 (0.252)	-0.071 (0.189)	-0.145 (0.144)
Reciprocal Transparency	-8.327*** (2.885)	-0.013 (0.069)	0.806*** (0.193)	0.694*** (0.144)	0.315*** (0.113)
Food Satisfaction					0.491*** (0.032)
Constant	24.265*** (3.992)	1.220*** (0.095)	4.685*** (0.135)	4.499*** (0.101)	2.185*** (0.169)
Observations	589	589	324	328	324
Item fixed effects	Yes	Yes	No	No	No
Meal fixed effects	Yes	Yes	No	No	No
Adjusted R-squared	0.581	0.001	0.055	0.083	0.473

Table 1 OLS regression models demonstrating effects of operational transparency on food service performance (Experiment 1).

Robust standard errors in parentheses. *, **, and *** signify significance at the 10%, 5% and 1% levels. Coefficients represent treatment cells relative to the baseline “blind” condition. Item controls include fish sandwiches (omitted), eggs, scrambled eggs, bean burritos. Meal fixed effects include lunch, dinner (omitted).

However, when chefs could observe customers, value perceptions were significantly higher for customers who could observe chefs ($M = 5.19$, $SD = 0.10$) than for those who could not ($M = 4.70$, $SD = 0.14$), $t(169) = 2.92$, $P < 0.01$) (**Figure 2**). Finally, while improvements in objective quality are independently predictive of service value perceptions ($\beta = 0.49$; $P < 0.01$), the positive effects of reciprocal transparency on perceived service value remain robust after controlling for food satisfaction ($\beta = 0.32$; $P < 0.01$) (**Table 1**). These findings are consistent with the notions that customer perceptions of value in service settings may improve when operational transparency is reciprocal and that both objective and perceptual factors distinctly contribute to the gains engendered by transparency, which we corroborate in an additional field experiment.²

² Are the perceived and objective differences in evaluated performance distinct effects? We conducted an additional field experiment in a separate university dining hall that serves a non-overlapping group of customers drawn from the general population. 48 participants (39.6% female; $M_{age} = 32.53$, $SD = 9.81$) were recruited from the line of the dining hall’s sandwich station. In exchange for a sandwich provided at no cost on the following day, participants were asked to complete two surveys. In the first survey, participants rated their satisfaction with the sandwich they ordered and their perceptions of the value of the sandwich station ($\alpha > 0.86$). They also placed an order for the sandwich they would collect the following day. Participants were randomly assigned to one of two conditions. Those

When we debriefed the kitchen staff at the conclusion of this field experiment, one chef volunteered the following explanation: “When [the customers] can see the work we’re doing for them, they appreciate it, and I appreciate that. It makes me want to improve.” This interpretation suggests that customers who observe employees at work, relative to those who never see them, should perceive greater effort and experience deeper feelings of gratitude and reciprocity. Furthermore, chefs who are observed by customers may feel more appreciated, and in turn, become more satisfied and willing to exert more effort.

To test this intuition about the positive and reciprocal impact of operational transparency for customers and employees, we turned to a pair of laboratory experiments, which separately examined the mechanisms underlying the effects found in Experiment 1.

2.2. Experiment 2: Mechanisms underlying the effects on customers

In Experiment 2, 160 participants (53.9% female; $M_{age} = 23.73$, $SD = 4.07$) were randomly assigned to watch one of three videos portraying a service interaction at a cafeteria sandwich counter, viewed from the customer’s perspective.³ Participants were instructed to imagine themselves in the role of the customer as they watched the video. For analysis, we retained data from the 86 participants who watched at least the first minute of the assigned two-minute video (52.6% females; $M_{age} = 23.96$, $SD = 4.20$), as participants who watched for less than one minute failed to fully observe the experimental manipulation. Each video represented a service design employing a different type of transparency: 1) the customer handed the order to a non-chef employee, who relayed it to the chef, who made the sandwich out of the customer’s view (customer observes neither the chef nor the process), 2) the customer handed the order directly to the chef, who made the sandwich out of the customer’s view (customer observes chef outside the process), or 3) the customer handed the order to the chef, who made the sandwich in full view of the customer (customer observes chef throughout the process) (**Figure 3A**). To ensure equivalent outcome quality across conditions, all participants were shown the same image of a sandwich, pickle, and bag of chips as the outcome of the service, before being directed to a series of questions about their experience.

in the blind condition were escorted directly to a cooler to pick up the pre-made sandwich they ordered. Those in the transparency condition waited in the sandwich station line in view of the process. When they reached the front of the line, a research assistant escorted them to the same cooler to pick up their pre-made sandwich. After consuming the second sandwich, participants in both conditions were asked to evaluate their satisfaction with the sandwich and their perceptions of the value of the sandwich station. Perceived value and satisfaction measures were calculated against the prior day’s baselines. While customers in the transparent condition ($M = 0.27$, $SD = 0.71$) perceived the service to be more valuable than customers in the blind condition ($M = -0.27$, $SD = 0.53$; $t(46) = 3.02$, $P < 0.005$), customer satisfaction with the sandwich did not vary between the transparent ($M = -0.63$, $SD = 1.86$) and blind conditions ($M = -0.70$, $SD = 1.61$; $t(46) = -0.14$, $P = NS$). These results are consistent with our interpretation of the initial field study; reciprocal operational transparency increases perceptions of service value. However, since the sandwiches in this study were pre-made, this transparency did not influence the behavior of the chefs, and therefore did not result in an improvement in objective service quality.

³ All videos used in Experiments 2 and 3 were captured via a head-mounted camera worn by the focal actor during the service transaction.

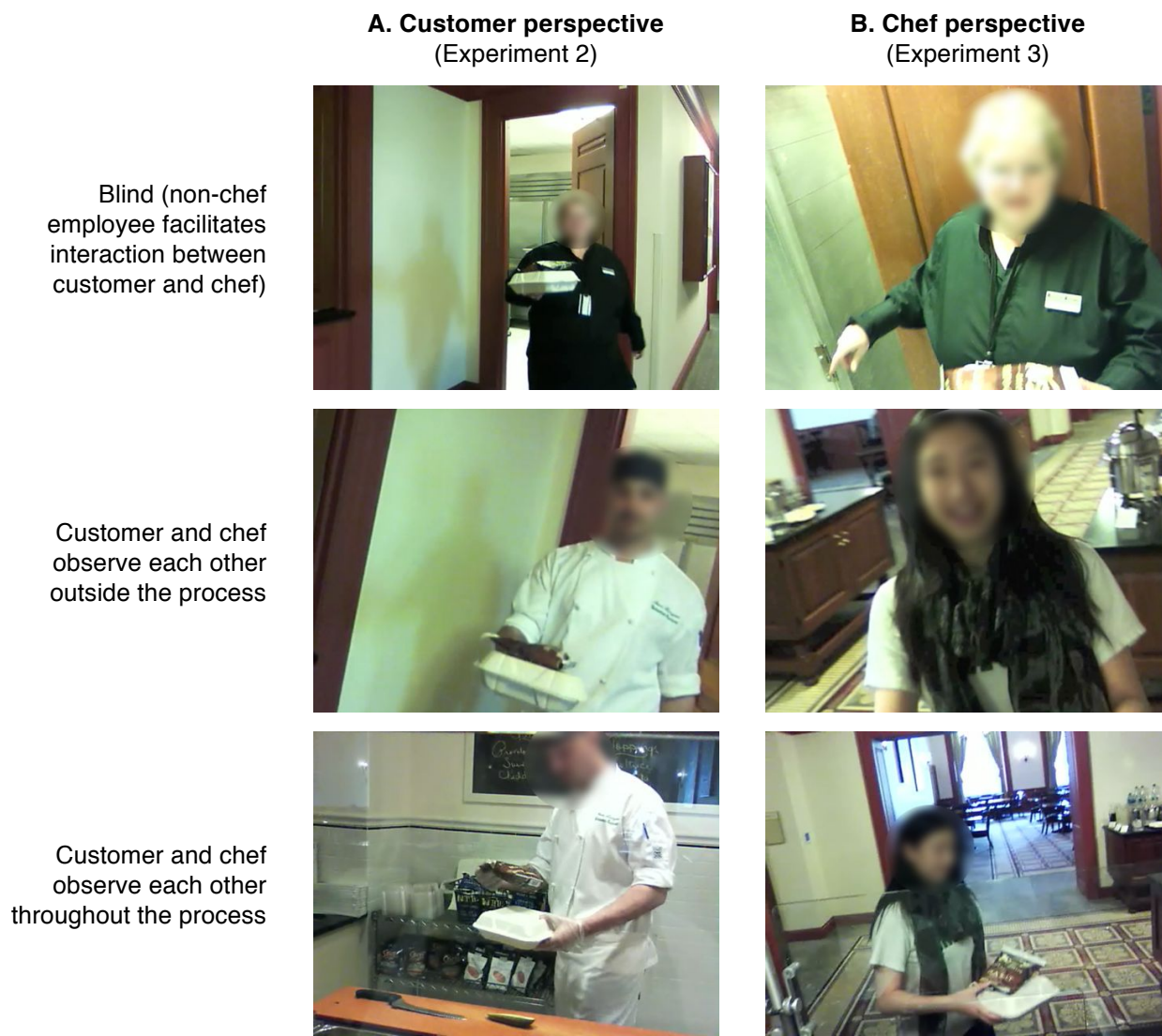


Figure 3 Screenshots of experimental conditions (Experiments 2 and 3). Note that in the blind condition, participants do not see who the chef is, unlike in the other two conditions. Furthermore, while the focal individuals' faces were obscured for publication, they were fully visible for participants in the experiments.

Along with the perceived value scale ($\alpha = 0.96$), we measured perceived effort using an adapted five-item scale: “How much effort do you think the chef put in?”, “How much expertise do you think the chef has?”, “How much experience do you think the chef has?”, “How thorough was the chef in delivering your food?”, and “How much care did the chef exhibit in delivering your food?” ($\alpha = 0.93$) (Buell and Norton 2011). We also measured feelings of reciprocity and gratitude using an adapted 3-item scale: “How positively do you feel toward the chef?”, “How appreciative do you feel toward the chef?”, and “How grateful do you feel toward the chef?” ($\alpha = 0.95$) (Bartlett and DeSteno 2006).

A univariate ANOVA suggests that there was a significant difference among conditions, $F(2, 82) = 4.84$, $P = 0.01$. More specifically, participants who observed the chef throughout the process reported higher perceived value ($M = 5.33$, $SD = 1.34$) than those who observed the chef outside the process ($M = 3.97$, $SD = 1.94$), $t(56) = 3.08$, $P < 0.01$; and those who observed neither the chef nor the process ($M = 4.42$, $SD = 1.70$), $t(53) = 2.21$, $P < 0.05$. There was no significant difference between participants who observed the chef outside the process and those who observed neither the chef nor the process, $t(55) = 0.93$, $P = NS$. Perceived effort and appreciation measures followed a similar pattern, with significant differences across conditions, $F(2, 82) = 6.53$, $P < 0.01$; and $F(2, 82) = 6.29$, $P < 0.01$; respectively. Participants observing the chef throughout the process perceived more effort ($M = 5.08$, $SD = 1.32$) and appreciated the provider more ($M = 5.32$, $SD = 1.47$) than participants who observed the chef outside the process ($M = 3.74$, $SD = 1.63$; $t(56) = 3.43$; $P < 0.01$), ($M = 3.97$, $SD = 1.84$; $t(56) = 3.08$, $P < 0.01$), and participants who saw neither the chef nor the process ($M = 4.22$, $SD = 1.30$; $t(53) = 2.44$, $P < 0.05$), ($M = 3.90$, $SD = 1.74$; $t(53) = 3.27$, $P < 0.01$), respectively. Similar to perceived value, there were no significant differences in perceived effort and appreciation between participants who observed the chef outside the process and those who observed neither the chef nor the process, $t(55) = -1.24$, $P = NS$; and $t(55) = 0.14$, $P = NS$; respectively.

To test the theory that operational transparency increases perceptions of effort that lead the customer to feel more appreciative of the employee and thus perceive the service as more valuable, we conducted a path analysis using the perceived effort, appreciation, and perceived value measures. As noted in **Figure 4**, observing the chef throughout the process is positively associated with perceived effort (standardized regression coefficient $\beta = 0.35$, $P < 0.01$), which in turn is positively associated with appreciation (standardized regression coefficient $\beta = 0.76$, $P < 0.01$), which has a positive association with perceived value (standardized regression coefficient $\beta = 0.64$, $P < 0.01$). These results are consistent with the theory that operational transparency enhances perceptions of service value by increasing perceptions of effort and feelings of reciprocity and gratitude.

2.3. Experiment 3: Mechanisms underlying the effects on employees

The results from Experiment 2 demonstrated the mechanisms underlying the effects of operational transparency on customer perceptions of quality, but what accounts for the objective improvement in employee service performance? In Experiment 3, 240 participants (35.1% female; $M_{age} = 52.21$, $SD = 11.48$) were randomly assigned to view one of the three cafeteria service interaction scenarios described above, this time from the chef's perspective (**Figure 3B**). Participants were instructed to imagine themselves in the role of the chef employee as they watched the video. For analysis, we

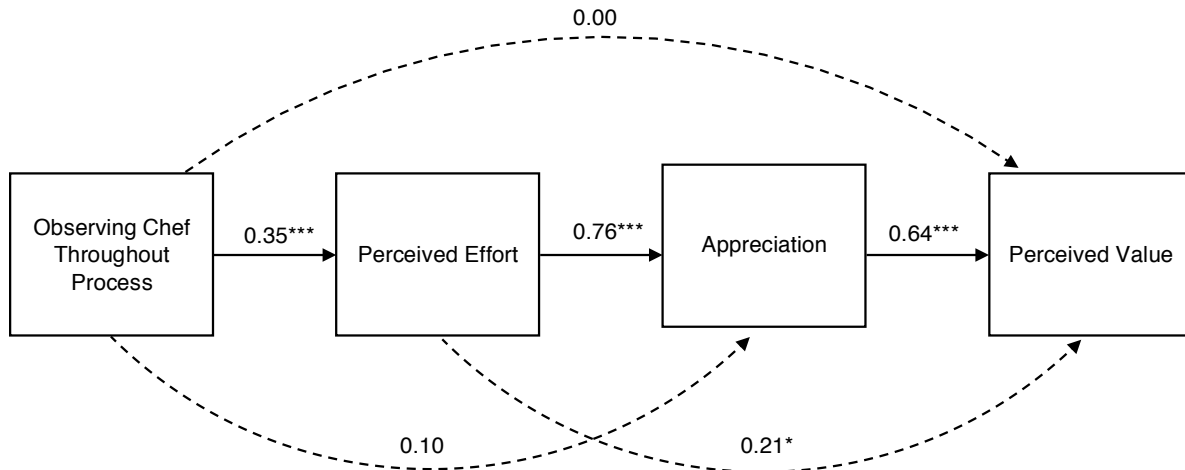


Figure 4 Customer path analysis (Experiment 2). Standardized beta coefficients displayed. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

retained data from the 231 participants (35.3% female; $M_{age} = 34.31$, $SD = 11.44$) who viewed at least the first minute of the two-minute video.⁴

We examined participants' intended effort after watching the video, measured as the mean of the responses to the following items: "When there's a job to be done, I devote all my energy to getting it done," "When I work, I do so with intensity," "I work at my full capacity in all of my job duties," "I strive as hard as I can to be successful in my work," and "When I work, I really exert myself to the fullest," ($\alpha = 0.94$) (Brown and Leigh 1996), as well as perceived job satisfaction: "How satisfied are you with your job in general?" We also measured the degree to which employees felt appreciated: "How much positivity do you feel from the consumer?", "How appreciated do you feel by the consumer?", and "How much gratitude do you feel from the consumer?" ($\alpha = 0.95$) (Bartlett and DeSteno 2006).

A univariate ANOVA revealed a significant difference in intended effort among conditions, $F(2, 230) = 4.55$, $P = 0.01$, with participants who observed the customer throughout or outside the process ($M = 5.47$, $SD = 1.26$) reporting higher intended effort than those who did not observe the customer ($M = 5.01$, $SD = 1.26$), $t(230) = -2.87$, $P < 0.01$. More specifically, relative to participants who did not observe the customer, intended effort was higher both for those who observed the customer outside the process ($M = 5.42$, $SD = 1.18$), $t(154) = 2.14$, $P < 0.05$, and throughout the process ($M = 5.52$, $SD = 1.07$), $t(151) = 2.74$, $P < 0.01$, and the difference between the two transparent conditions was not significant ($P = NS$). This pattern is consistent with the results of

⁴ The individuals portraying employees in Experiments 2 and 3 were actual employees of the dining hall where the scenarios were filmed. The individual who played the role of the customer in these experiments was an actual customer. All three individuals were blind to the hypotheses at the time of filming. Videos were captured for Experiments 2 and 3 using a head-mounted camera worn by the individuals portraying the customer and chef employee, respectively.

Experiment 1, in which employees who saw customers exhibited increased efficiency and produced higher quality output, relative to employees who did not see customers. Our results also suggest that transparency can boost employee morale. Employee satisfaction varied with marginal significance across conditions, $F(2, 227) = 2.86$, $P = 0.059$, with participants who observed the customer ($M = 5.08$, $SD = 1.24$) reporting higher satisfaction than those who did not ($M = 4.71$, $SD = 1.37$), $t(228) = -2.08$, $P < 0.05$. Those who observed the customer outside the process ($M = 5.21$, $SD = 1.10$) reported significantly higher job satisfaction than those who did not observe the customer, $t(152) = 2.47$, $P < 0.05$, but there was not a significant difference in satisfaction between those who observed the customer throughout the process ($M = 4.96$, $SD = 1.36$) and those who did not observe the customer ($P = NS$). Consistently, appreciation measures differed among conditions, $F(2, 229) = 28.81$, $P < 0.01$, with participants who saw the customer feeling more appreciated ($M = 4.91$, $SD = 1.24$) than those who did not ($M = 3.48$, $SD = 1.64$), $t(230) = -7.41$, $P < 0.01$. More specifically, participants who saw the customer throughout the process ($M = 4.73$, $SD = 1.21$) and outside the process ($M = 5.08$, $SD = 1.24$) felt significantly more appreciated than those who did not see the customer at all, $t(154) = 6.87$, $P < 0.01$; and $t(151) = 5.36$, $P < 0.01$ respectively.

The intuition provided by the chef in the field and our findings from Experiments 1 and 2 suggest that producers' willingness to exert effort was sparked by their ability to see customers. To test this theory, we conducted a path analysis using the appreciation and effort measures. Observing the customer is positively associated with feeling appreciated (standardized regression coefficient $\beta = 0.42$, $P < 0.01$), which in turn is positively associated with effort (standardized regression coefficient $\beta = 0.37$, $P < 0.01$). In addition, we find that feeling appreciated mediates the relationship between observing the customer and job satisfaction (Figure 5). In both analyses, no significant relationships between the variables lie off the hypothesized causal path.

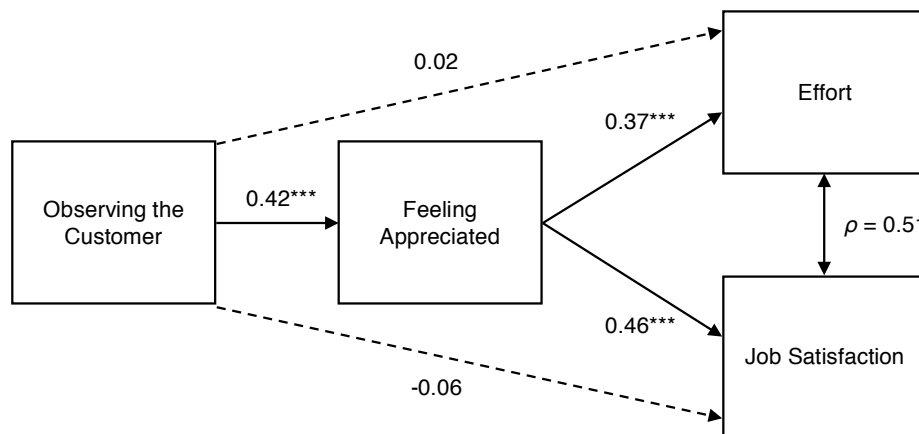


Figure 5 Employee path analysis (Experiment 3). Standardized beta coefficients displayed. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Our findings from Experiments 1 and 2 provide evidence against alternative accounts. In particular, consumers might in effect play the role of an on-site manager when they are able to see employees at work; employees' awareness of such monitoring may increase their feelings of accountability, leading to enhanced work performance and a higher likelihood of meeting organizational goals. These explanations are inconsistent with our field results; seeing customers led employees to produce higher quality food, even when those customers could not see the employees. However, because accountability remains a prominent alternative account, we replicated Experiment 3 with 268 new participants (56.3% females; $M_{age} = 35.01$, $SD = 11.56$) and included an established accountability scale (Hall et al., 2006).⁵ We found that accountability varied significantly across conditions, $F(2, 264) = 7.26$, $P < 0.01$, following the same pattern as appreciation, $F(2, 262) = 47.51$, $P < 0.01$. However, accountability did not account for the indirect effect of seeing customers on effort and job satisfaction, but feeling appreciated did.

A univariate ANOVA revealed a significant difference in appreciation among conditions, ($F(2, 262) = 47.51$, $P < 0.01$), with participants who observed the customer feeling more appreciated ($M = 4.97$, $SD = 1.22$) than those who did not ($M = 3.26$, $SD = 1.67$), $t(263) = -9.59$, $P < 0.01$. More specifically, participants who observed the customer throughout ($M = 4.79$, $SD = 1.19$) and outside the process ($M = 5.14$, $SD = 1.23$) felt significantly more appreciated than those who did not observe the customer at all, ($t(180) = -6.96$, $P < 0.01$) and ($t(182) = -8.52$, $P < 0.01$). Participants who observed customers ($M = 5.47$, $SD = 1.15$) reported higher intended effort than those who did not ($M = 5.28$, $SD = 1.38$; $P = NS$). Relative to participants who did not observe customers, intended effort was higher both for those who observed the customer outside the process ($M = 5.42$, $SD = 1.24$; $P = NS$) and inside the process ($M = 5.52$, $SD = 1.06$; $P = NS$). We note that while accountability did not lead to increased levels of effort in our experiments, it offers an important parallel outcome that could contribute to improved performance on its own.

3. Discussion

From restaurants that adopt open-kitchen designs, to schools that “flip the classroom” and integrate video lectures with individual guidance and interaction, to hospitals that encourage doctors to make decisions in collaboration with their patients, our results suggest that consumers may not be the sole beneficiaries of such innovations in transparency. Operational transparency between customers and employees essentially positions both parties as actor and observer, each with the potential to benefit from the other, and in ways that create perceived and objective value. *Seeing*

⁵ As with Experiment 2, for analysis, we retained data from the 268 participants who watched at least the first minute of the assigned two-minute video. The original data set consisted of 524 participants (52.7% female; $M_{age} = 33.44$, $SD = 11.83$).

the work can cause consumers to better appreciate the effort exerted by producers, increasing their perceptions of service value. *Feeling appreciated* can cause producers not only to feel more satisfied with their jobs, but also to exert more effort on behalf of consumers, leading to better performance.

We note that these gains in performance can be economically meaningful. In our primary field experiment, the introduction of reciprocal transparency contributed to a 17.3% increase in customer-reported quality and reduced throughput times to 86.8% of standard. To the extent that implementing transparency may be less costly and disruptive than alternative approaches for improving performance, our results therefore cast transparency as one additional lever that service managers may consider to improve the efficiency of their processes and the quality of outcomes they deliver. Furthermore, by making operational processes transparent, we suggest that companies can imbue them with substantive meaning for customers and employees alike, in ways that could potentially benefit the company. Enhancing customer perceptions and appreciation for the effort expended and increasing their perceptions of service value could promote top-line gains through improved customer satisfaction and loyalty. Helping employees feel more appreciated and satisfied could reduce costs by decreasing turnover. Moreover, increasing their willingness to exert effort may reduce the need for monitoring, resulting in further cost savings.

Owing to the reciprocity inherent in the mechanisms underlying these effects, consumer or producer-side breakdowns may inhibit gains. For example, transparency may not improve consumer perceptions when service processes are unappealing, service outcomes are deemed unfavorable, or when transparency makes it salient that work is not being performed. Revealing the process that delivered a dissatisfying result has been shown to reduce perceptions of service value (Buell and Norton 2011), and to the extent that transparency reveals that a process is failing to keep up with the demand for its service, it may be no more helpful than not being transparent at all (Buell and Norton 2013). Furthermore, transparency may not increase quality and efficiency when producers are already operating at peak capacity (Kc and Terwiesch 2009, Oliva and Sterman 2001).

Understanding the contextual factors and boundary conditions that influence the effects of operational transparency on service outcomes remains a fruitful area for future research. Open questions abound. For example, while the present work explores the impact of transparency without interaction, the net effect of interactive operational transparency, in which customers and employees can directly communicate with one another, has not yet been explored. On the one hand, interaction may facilitate information sharing, which could mitigate rework and improve efficiency, while promoting familiarity among customers and employees. On the other hand, interaction may be distracting and foster negative exchanges, worsening experiences and diminishing efficiency. Another open question is the persistence of these effects. While our results were consistent throughout our

period of analysis, the long-term effects of operational transparency among customers and employees remain undocumented. While operational transparency may not foster improvements in all circumstances, our results suggest that by leveraging it to grant producers and consumers reciprocal access to visual information, organizations have the potential to tap into a virtuous cycle that enhances both perceived and objective service performance.

More broadly, evidence suggests that consumers may inherently prefer operationally transparent designs. When we surveyed a separate set of 103 participants (57.9% female; $M_{age} = 33.54$, $SD = 11.77$) about their attitudes toward transparency, we found that a significant majority (76%) believed that their lives would be enriched by having more face-to-face interactions, $\chi^2(1, N = 103) = 27.27$, $P < 0.01$. Similarly, participants would be willing to pay more if they received their preferred degree of in-person service during consumer transactions, $t(102) = 4.78$, $P < 0.01$.

In a culture where speed and automaticity often trump other values, we suggest that seeing and appreciating the people who help us, and allowing them to see us in return, can lead to experiences that are objectively better and more fulfilling for everyone involved.

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