

THE PSYCHOLOGY OF WAITING LINES

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The Psychology of Waiting Lines

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Waiting may very well be an inescapable part of life, but that doesn't mean we enjoy it. But if the lines are truly inescapable, what can be done to make them less painful? Although there is a good deal of practical knowledge, usually known within the heads of corporate managers, very little has been published about the topic. One paper provides the classic treatment: David Maister's *The Psychology of Waiting Lines*¹. Maister suggested several principles for increasing the pleasantness of waiting. Although his paper provides an excellent start, it was published in 1985 and there have been considerable advances in our knowledge since then. In this section, I bring the study of waiting lines up to

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date, following the spirit of Maister's original publication, but with considerable revision in light of modern findings.

Waiting lines are well studied in the field of operations, as an examination of their textbooks will tell you - or for that matter, searching for the string "waiting lines." But in these studies, the emphasis is on the mathematics of efficiency: what is the best scheme for handling customers with the least cost? How many clerks must one hire to handle an expected number of customers, each with some expected probabilistic rate of arriving and some probability distribution of the amount of time it will take to be served. All this is indeed necessary, but it misses the human element; what the experience is like for both customer and clerk. The overall emphasis on mathematics has resulted in the horrible experiences we have today, where cost and efficiency are the critical metrics and fairness, equity, and the experience of the people are ignored. Talked about, yes, but because they cannot fit into the equations, the end result is that it is ignored. This chapter deals with the experience. Experience is more important than efficiency for the survival of the business.

Note well these principles, for they apply to all services, not just the waiting in lines. Sure, the details will vary from situation to situation, industry to industry, but the fundamentals are, in truth, the fundamentals of sociable design for waiting lines, for products, and for service.

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Figure 1 The line must be seen as appropriate and fair. Waiting line at a cafeteria, School of Engineering, Northwestern University. The model is clear, feedback is inherent in the situation, and although students, staff, and faculty dislike the line, it is perceived as appropriate and fair.

1. Emotions Dominate

Emotions dominate: this is the most important and critical of the principles. Not only do emotions dominate over all else, but all the other rules are essential to ensure a positive emotional reaction. Emotions color the experience and, more importantly, how the experience will be remembered. As principle 8 states, the memory of an event is more important than the experience itself.

Emotion impacts people's judgments. In *Emotional Design* I summarized much of the research with the statement "Attractive things work better." Wash and polish your car and it drives better; shower and dress up in fancy clothes and the world looks brighter. Obviously washing a car does not make it any better mechanically, but it makes one's perceptions more forgiving. When in a positive mood, minor setbacks are considered minor, not a major problem. But when anxious or irritable, the same minor setback can become a major event.

Design Implication: Make the surrounds bright and cheery, attractive and inviting. Make sure that everyone is in a cheery mood. Disney theme parks send their employees (cast members) in costumes to entertain the people in line. The environment is not just the physical surroundings, but it includes the employees and other customers. Employees have to be seen as cheerful and helpful, and teaching employees how to be that way, especially after a long

shift of high stress interaction with numerous unruly and upset customers, families, and children, is a worthy design challenge in its own right. Even so, the demeanor of the employees can make a dramatic difference upon the impressions. Similarly, it is important to overcome the negative emotions of upset customers. I have been told that “Disney employees are taught to pay special attention to customers who are most upset, both because they are unhappy, and especially, because negative emotions can spread, an observation very consistent with the vast research on emotional contagion.”²

When problems arise, take care of them immediately. Emotions are contagious. Get people happy and smiling and people around will be happy and smiling. But have one person upset or angry, and these emotions can spread. Get people in a good mood and keep them there. Emotions dominate everything else.

2. Eliminate Confusion: Provide a Conceptual Model, Feedback and Explanation

Provide a clear, unambiguous conceptual model of how the line operates, where people should enter, what is to be expected, and how long it will take. Ever arrive at a milling crowd, not knowing how to proceed? Here is another role for signifiers. Don't know what to do? Do what everyone else is doing. This sensible strategy can sometimes lead to harm if there is inappropriate communication. People may automatically stand in the lines, assuming that this is what they are meant to do, finally arriving at the serving position only to be told that they were in the wrong line. That's not good news. People understandably get very upset, especially if it was a long line. The reflective emotional system moves from surprise to astonishment, from anger to blame. When someone has done what appears to be the correct, sensible action, only to be told it is wrong, the resulting emotions can be strong and powerful. It is not wise for a business to arouse these.

It is essential that the environment provide clear and unambiguous indication of what lines do what activities, of how to enter the lines, and what information or material is going to be required. Clear and unambiguous social signifiers are essential here. This requires all the skills of a good designer: good observational studies, good ideas, good prototypes, and continual observations, checks, and refinement.

One of the major determiners of emotional unhappiness is fear of the unknown and uncertainty. How long is this line, anyway? Provide ample feedback. Estimate the duration, making sure to give the maximum estimate so that the customers will not be disappointed. The slightly greater negative impact of a longer time will be more than offset by the relief of having expectations exceeded (see rule 3).

If new problems arise, let everyone know. This minimized uncertainty while also providing reassurance that you remember them, that you are taking good care of them, and you care about them. Even if the news is negative, the fact that you are willing to tell them can overcome much.

One of the worst offenders of the waiting experience is the hospital. Anxious patients and family wait in limbo, often in dull, dreary surroundings that help set the negative anxiety, coupled with a complete lack of information, thus stimulating all levels of negative emotions (Figure 4).

What is the ailment? How serious is it? How long must we sit in this room? Is there anyone who can give any information? Usually the answers to all of these questions are “we don’t know, nobody knows.” There are many operational and legal reasons for withholding information, including simple overload on the part of the hospital staff, all struggling to cope with the workload. But a major



Figure 2. Waiting outside emergency and critical care rooms. Hospitals can provide some of the most anxiety-provoking waiting situations, with uncomfortable surrounds, a potentially bad outcome, and often, a complete lack of information.

reason is lack of thought and appropriate design. Hospitals are designed with many concerns in mind: the insurance companies, the owners, the administration. And the physicians, nurses, and staff. And, yes, the patients. Waiting rooms? Yes, they are needed, so they are added. But it is the rarer hospital that spends time, effort, and money concerned about the treatment of people in those waiting rooms, or about the emotional state of the patient, let alone relatives and friends.

3. The Wait Must Be Appropriate

When people must endure waits, they should know why. Moreover, they should agree that the wait is unavoidable and, therefore, that it is reasonable that they should have to wait. This is the role of feedback and explanation and is an important component of fairness (principle 6). The reasonableness depends upon the situation. Here is where the conceptual model is so critical, because during the wait, people will naturally wonder why. If they have a good model for the actions taking place behind the scenes that necessitate the wait, they are apt to accept it as necessary and appropriate. Without a good conceptual model, they will make one up, and made-up ones are very apt to be inaccurate and badly misleading. Make sure there is good understanding: it helps make the wait seem appropriate.

If the wait is caused by factors outside of everyone's control, as when an airplane flight is delayed because of severe weather, then the reason for the wait is understandable and accepted. This doesn't mean the wait will be tolerated: the other rules still apply, but at least one barrier is overcome. If the airline claims the wait to be weather related, but the customers are skeptical (because, the customers are apt to claim, "that's what they always say", this means the bonds of trust between service provider and customer have been frayed: a reason does not work well unless it is believed.

When there is a clear reason for a wait, such as a busy restaurant, or a filled amusement park, the wait can be tolerated as long as its duration is appropriate to the reason. Thus, although I dislike the 15 hour flight from Chicago to Hong Kong, that wait seems unavoidable, and therefore acceptable. When there is no apparent reason, or worse, when the reason is visible and seemingly inappropriate, the wait will not always be tolerated.

If service in lines is slow, but all the clerks are clearly working hard and all the positions filled, the wait might be tolerated, as in customs and immigration lines at airports. But when there is a large crowd awaiting service, yet only a few people providing it, then the tolerance shifts to blame to the service provider for not reacting to the need. Worse is when there are service people available, but not helping, especially if they seem to be relaxing and enjoying themselves. Even though it is appropriate for service people to take breaks from the arduous routine of processing customers, those breaks should be done out of sight of the customers.

The wait must be perceived as appropriate, both in its cause and its duration. Similarly, the service provider should be perceived as responding appropriately to the demand.

4. Set Expectations, Then Meet or Exceed Them

Experiences should exceed expectations. One of the prime determiners of behavioral level emotional states is expectations. First there is the expectation itself. Thus, walking a narrow plank at a high height can induce the expectation of falling plus injury, and if the plank really has to be walked across, there is very little that can be done about this perception. In the world of design, we try to overcome such problems with walls, handholds, by making the plank seem wide and secure and perhaps by hiding the visible evidence of

the distance one might fall. But if there is just a plank and no chance to redesign it, the initial emotional state is negative.

Conceptual models again: expectations are set by one's model of what is going on, so ensure that the model people have of the line and the activities is reasonable.

So too with lines. Once people discover the line, their state is negative. Some places are masters of disguise, however, making the line appear far shorter than it really is. Theme parks regularly make the line turn corners, so that at any point, the line looks only as long as the distance to the next corner. Deceitful? Yes, but still helpful.

The expectation of the wait is also set by the rate at which the line moves, so all other things being equal, make the line move quickly. Suppose there are 10 cashiers serving the crowd. If the crowd were divided into ten lines, each line would be 1/10 the size of a single line, but it would also move at an average speed of 1/10th as fast. Therefore, the combination of one line served by ten cashiers plus multiple turns would provide ideal expectations: a fast moving line and a visually appearing short line.

Here is where feedback is so important: always keep expectations in tune with reality, and if there is variability or uncertainty in the estimate, provide the upper time, so that they are far more likely to end up pleasantly surprised than angered because the promised time was not met.

5. Keep People Occupied: Filled Time Passes More Quickly Than Unfilled Time

This rule derives from the psychological properties of time and distance. To understand this rule it is important to understand the difference between physical variables and psychological ones. They are not at all the same, even though we may use the same names to describe them. Thus, physical time and distance are precisely specified and measured by physicists, but to a person, perceived distance and time vary according to the context. Moreover, a person's immediate perception of duration and distance can be very different from remembered perception of that experience. Psychological duration is dramatically affected by the mental activity of the person. While filled with events feels as if it is passing more quickly than the same physical time without events (an empty period), it is remembered as having lasted longer than the empty period.

Time and distance share many psychological attributes. Thus filled space looks as if it is longer than the same length of empty space. One side effect of this phenomenon is the moon illusion: the moon looks larger when it is at the horizon than when it is overhead, probably because the sky looks further away at the horizon because the viewer can see objects along the path whereas when looking straight up, the space is empty. The moon is the same size (the same visual angle) in both cases, but if it is perceived as being further away when at the horizon, the perceptual system assumes it must be larger. All subconscious and automatic: it is a very compelling illusion.

These distinctions between filled and empty time and filled and empty space can be used to advantage in the design of waiting lines. Keep them moving fast, keep them appear to be short, keep them filled with interesting things to look at, interesting activities to do.

One trick to making a line enjoyable is to make it seem as if it isn't a line. Good examples can be found in the entertainment industry, especially in theme parks. Parks operated by Disney are famous for how they handle lines, curving them around so that they are visually short. Providing entertainers to engage the people in line, ensuring they are enjoying themselves. It helps if lines move quickly, so a long, fast-moving line can be preferred to a short, slow-moving one, even if the actual waiting times are the same in both cases. Moreover, long lines can be made to look short by clever placement of the route, with bends hiding the part of the line ahead.

6. Be Fair

The reflective level of emotion is heavily influenced by perceived causal agents. Here is where people assign credit and blame. If a waiting line seems reasonable, even though it is a negative experience, it will not necessarily trigger a strong negative emotion. The emotion comes if the line appears to be arbitrary, unpredictable, and worst of all, unfair.

Do others have an unfair advantage? Do other people cut in line? Are there special people who don't have to wait in line? All of these can lead to a heightened negative emotional states, far more severe than the state of having to wait longer than expected. One of the strongest determiner of a good experience is whether treatment was fair. With long waiting lines, resentment builds when some people appear to take advantage and get ahead of others. There are multiple places where fairness impacts.

One problem with multiple lines is that the other line always appears to be moving faster. This is true of cars in highway lanes and people in shopping market checkout lanes. Whatever lane you switch to, the other one moves faster. The perception occurs because the amount of time to process a person varies. Some people are processed quickly, others incredibly slowly. And no matter which line you are in, it always seems as if it is indeed the slowest. We note and remember when people in other lines start moving faster than the line we are in. We tend not to notice when our line moves quickly ahead of the others. It is this asymmetry that leads to the perception of unfair lines.

So even if the perception is not really true, everyone is unhappy with the relative speed of their line compared to the others. There is a solution: simply form one line, with the person at the front of the line, going to whichever service person is free.

It is also very important not to let people cut ahead of others. If there is some need to do so, they should enter in special unmarked doors, out of sight of the people who are waiting in line. I return to this point shortly.

7. End Strong, Start Strong

Considerable psychological evidence shows that both the start and the end of an experience are most critical in determining one's memory of the event (this is called the serial position effect). In part the findings are also consistent with the fact that the immediate perceptions and expectations are set by the start of the line, and once a bad expectation is set, it is difficult to overcome it. But

the memory of the experience is set primarily by the ending. Here, it has been shown that if two events are exactly identical except that one has an addition period added which is positive compared to the preceding experience, the longer event is judged better than the shorter one³. This is counterintuitive because the longer event has all the unpleasantness of the shorter one, plus even more, except at a lower level of unpleasantness. But it is the memory of the ending that dominates. To my knowledge nobody has done the experiment, but I predict that adding a bit of time to the end that is incredibly positive and fun would make the total experience seem even better.

8. Memory of an Event Is More Important Than the Experience

Which is more important: the experience during an event or the later recollection of that experience? In the abstract, the question would seem difficult to answer, but consider that your future behavior will be controlled by your memories. Memory is by far the more important aspect of the waiting line experience, one reason the ending experience is so much more important than the beginning or middle.

DESIGN SOLUTIONS FOR WAITING

Culture and Line Behavior

It is tempting to propose universal solutions to the problem of waiting in line, but once groups of people are involved, behavior and expectations are determined for a large number of social, societal, and cultural reasons. Different cultures have different expectations and behave differently. As a result solutions must take into account cultural sensitivity.

One major difference is whether there should be a line at all. Waiting takes on different forms in different parts of the world because different cultures treat the waits quite differently. In some, the national stereotype would be England, polite, orderly lines - queues - are the rule. In other cultures, the rule seems to favor the nosiest or most forceful, so those who wait in line for their turn might never get served. Travel around the world and the differences are striking: orderly queues of waiting people in London; disorderly mobs clamoring for train tickets in China. Cars in traffic waiting their turns at traffic lights, staying within their lanes in one country and chaotically forcing their way through traffic in another.

In some places, it is permissible to let others into the line, either just in front or in back of you, without consulting the people behind, all of whom suffer. In other places, this is socially frowned upon. Can one person reserve a space for another? In a long line, can you leave temporarily and then regain the place you had before? Often the answer is yes, but only if you have requested permission first from the person behind you.

What about selling your place in line, or hiring others to stand in line for you. These behaviors are common when lines must wait overnight, or in extreme cases, for days, which is not uncommon behavior when tickets are being released for some popular event, or some new, exciting consumer product is being released.

Cultures can be changed. McDonald's changed queuing behavior in Hong Kong:

The social atmosphere in colonial Hong Kong of the 1960s was anything but genteel. Cashing a check, boarding a bus, or buying a train ticket required brute force. When McDonald's opened in 1975, customers crowded around the cash registers, shouting orders and waving money over the heads of people in front of them. McDonald's responded by introducing queue monitors—young women who channeled customers into orderly lines. Queuing subsequently became a hallmark of Hong Kong's cosmopolitan, middle-class culture. Older residents credit McDonald's for introducing the queue, a critical element in this social transition⁴.

So, yes, culture can be changed, but don't count on it. And even if it is changeable, it is apt to take years, perhaps decades. Of all things changeable, culture is the hardest. Moreover, the same *Encyclopaedia Britannica* article from which the McDonald's quotation was taken also warns:

"It would be a mistake, however, to assume that ... innovations have an identical, homogenizing effect wherever they appear. ... It remains difficult to argue that the globalization of technologies is making the world everywhere the same. The "sameness" hypothesis is only sustainable if one ignores the internal meanings that people assign to cultural innovations."

The Importance of Task Analysis

Consider the checkout lane of a cafeteria. In one typical arrangement, a cashier sits in front of a cash register and tallies up the cost of the individual items displayed by the customer, who pays and leaves. If you observe the operations carefully, you will notice that both cashier and customer spend a could deal of time waiting for the other. The result is that the operation is quite inefficient. Efficiency is one of the major goals of people in operations, and although I am not a fan of efficiency over enhanced customer and worker experience, but in this case, the inefficiencies are detrimental all around. They detract from the experience of both the customer and the clerk, as well as costing more money for the store if they must hire more cashiers and put in more checking station. So, even if the goal is to optimize customer and worker experience, the analysis and solutions would be the same.

Where are the inefficiencies? In the setup and cleanup times. Watch the customer. First, the customer waits in line until the previous customer has left and the clerk seems ready. Then walk up to the cash register, put all items on the counter. Wait while the clerk tallies up the items and presents the cost. Then, fumble for the wallet and the credit card, or money, or check. Fumble to pay. Fumble to put away the any returned money and receipts. Put everything away, clean up the counter and leave. Then there is a delay as the next customer determines that the cashier is available, walks up to the counter, and unloads their items so the clerk can tally them up, repeating the cycle. The cashier spends a lot of time waiting for customers to show up, waiting for them to unload, to pay, and to clean up so the next customer can arrive. In turn, the customer waits during the inefficiencies of previous

customers, then adds to the wait through their own inefficiencies, waiting also while the clerk tallies up their items and presents the bill.

From the customer's point of view, the process is wait, move up, unpack, wait, pay, pack up, leave. From the cashier's point of view, it is wait, tally the items, wait, receive the payment, provide receipts, wait.

This is the power of task analysis. It allows one to identify the activities of all participants, the better to develop solutions that increase both efficiency and experience. How can these problems be solved? One way is to reduce the time taken for these operations. Another is to allow the cashier to service other customers while the first customer sets up and, later, cleans up. Yet another approach is to provide buffering space for the setup and cleanup activities to take place without interfering with the previous or next customer. Let us look at some of the known solutions.

Double Buffering

In the world of computer graphics, where it is very important to be able to display images rapidly and smoothly, one standard technique is to use two different storage areas: two buffers. While one buffer is in use, the other buffer is being filled. Then, when the display of the first buffer is over with, the display switches to the second buffer, so there is interruption in the picture. And while the second buffer is now being used to display the image, the first buffer is being filled with the next image.

The very same procedure can be applied to amusement parks, or any situation where people are served in batches. Consider rides and other amusements that take a batch of people all at once. While the first batch of people are enjoying the experience, the second batch are in line, waiting. How do we make that line enjoyable? Ah, we turn it into its own experience.

Clever design transforms the otherwise non-enjoyable waiting room into useful, positive experience by making it serve as a "briefing" or "preparation" rooms. There, the waiting people are entertained, perhaps by having the mission they will be engaged in explained, or perhaps being told the back plot and background information of the activity. The result is that people perceive this as part of the total experience. They are being entertained in a way that is directly relevant to the event, so they do not perceive it as a waiting line.

Spatial double-buffering: Two-Sided Checkout Lanes

Double buffering is used in the two-sided cash register to dramatically reduce waiting. Customers to the left, customers to the right, with the cashier in the middle. The clerk waits on the left side customer and when finished, turns to the right side customer who should be ready to be served. This gives the left side customer time to pack up and leave and for the next customer on the left to get ready to be served. Finish the right side customer and turn to the next left side customer, giving the customer on the right time to clean up and leave and for the next person to show up on the right. Smooth, efficient, and more pleasurable for everyone. But yes, it takes up more room in the store and requires restructuring the equipment.

The real secret here is recognizing that customers need space and time to deploy and get ready for a transaction, then more time and space to clean up after finishing. By providing two spaces, two buffers if you will, the one salesperson could alternatively serve arriving customers more quickly and efficiently. Double buffering is the solution.

Temporal double-buffering: Checkout Lanes

The two-sided checkout lane is a spatial double buffering, with one buffer on each side of the cashier. A second use of double buffering is temporal, laying out sufficient linear space to segregate the operations: setup, tallying the items, and cleanup thereby allowing the next customer to load up the setup buffer even before the first customer has finished. A good example of this is supermarket checkout lanes.

Supermarkets often use linear space to separate setup, tallying, and cleanup. An automated belt moves grocery items from the setup location to the tallying location. The belt is long enough to hold the items for several customers, often with a separator between them. Then, when it is a customer's turn, the belt conveys the material to the cashier, freeing up space for the next customer to unload. Moreover, as each item is tallied, it is then moved to a large cleanup area where either a second employee or the customer can pack the purchased goods into bags, allowing the cashier to deal with the next customer.

Temporal double-buffering: Drive-through Restaurants

Drive through restaurants use a temporal double buffering scheme. Customers drive their cars up to an ordering window and place their order. Then, they must drive their car around the building to the takeout window. This second drive, which is often deliberately made long by requiring the driver to go around one to three sides of the building, serve two purpose. First, the first car clears the ordering window for the next customer. Second, the time require to drive between windows gives the store staff sufficient time to prepare the order. This linear separation of the two activities of ordering and the receiving and paying, also allows room for two queues: one to wait until the order is placed (where the waiting time can be useful, giving customers time to peruse the menu and make their decisions), the other queue to wait for the delivery of food and payment.

It is possible to make payment at yet a third location, which in some cases can lead to even greater efficiency.

Temporal double-buffering: Coffee shops

Many coffee shops and fast food locations use a form of linear, temporal double buffering by having orders placed at one window, pickup at another. Once again, this separates the activities, allowing for greater efficiencies. People placing orders are not delayed by the wait for previous customers to pay for and pick up their food. In addition, the separation gives space for several queues, especially important because in these places, the orders might not be filled in the same order as they were received. Items that are fast can be put ahead in the pickup queue. Complex items can be delayed. A linear, single line, would have to move at the rate of the slowest item.

Designing the Lines

One line Feeding Multiple Servers

Now consider lines at a bank, or airline check in, or security checkpoint, or almost any place where lots of people have to undergo some sort of process, whether it is to purchase an item, to do a transaction, or to be cleared to receive permission to do something.

Five service people, five lines. We have all probably experienced this, except perhaps in those countries where lines are not part of the culture, so everyone mills about, hoping to get the attention of someone to help them.

This system has its own set of issues to be solved, with the details varying from situation to situation. This analysis could go into great depth: I have no doubt that an entire book could be written with the various ways of handling lines of customers. Handling customers is a design problem, and with proper observation of the bottlenecks and issues to be overcome, the service can often be made both more efficient and more pleasurable. Efficiency need not come at the expense of overburdening the clerks nor under-serving the customers. In the end, it is a design problem.

Customers far prefer the perceived fairness of a single line feeding multiple servers rather than individual lines in front of each server. The single line moves more quickly than the multiple lines, even if the total numbers of customers served at any time is the same. Moreover, the perceived fairness is dramatically different.

The major difficulty with the single line scheme is deploying people to the correct server. If there are many servers, it isn't always easy to tell when one is free. Oftentimes this is done by the people themselves, with people not at the front of the line always eager to tell people when a server is free. The problem is compounded by the fact that even when the previous customer has left a server, that position may not be available, so it is necessary to wait for some signal. As a result, inefficiency increases as each customer waits for a clear signal to proceed, then must walk over to the server, unload their materials, and initiate the transaction. This calls for yet another double-buffer solution.

In some situations, the double buffering is aided by having an employee act as a line manager, directing each person to the next available line. In some cases, I have seen this done so as to form a deliberate second queue in front of each clerk, usually just one or two people long. By always having one or two people in line in front of each clerk, the startup time for the next person is minimized, although there is some risk that the one person in front will be the one with a long, complex, lengthy transaction, leaving the one person left in the queue feeling unfairly served. An alert line manager can solve this problem by moving them quickly to another line.

All sorts of clever variations on this procedure have been introduced, including the use of electronic signaling systems to let customers know which clerks are available. I've seen this done with flashing lights and with display screens that have arrows pointing in the correct direction, giving the name or number of the target location.

Number Assignment

Handing out numbers to arriving customers, sometimes differentiated by the type of service required is a version of the single line, multiple server solution, but in this case allowing the customers to sit or walk around rather than stand in line. This also has the advantage of allowing different classes of customers to be served differently. Thus, in Departments of Motor Vehicles, which often use this scheme, people waiting for a driving test are in a different numerical queue than people who simply need a form, who might be in a different queues from people waiting to renew a license or form. The numbers themselves provide feedback, so people can track both the rate of progress of the queue and also how far away their number is from the number currently being waited on.

Of course, electronic variants are possible, which includes handing out pagers to people so they will be buzzed when their time comes. I haven't yet seen notification through mobile phones, but I have no doubt this will come. The electronic variants have virtues of giving people more freedom to wander, but they eliminate the feedback that comes from being able to observe the length of a line or the current number being served.

Targeted Admission Times

One way to minimize the trauma of waiting lines is through reservations. But this has to be done in a way that seems fair and equitable, even to those without reservations. That is, they have to believe that they too could have enjoyed the benefit of a reservation had they planned ahead. A modification of a reservation system is to provide each person with an admissions ticket with a guaranteed time, even if it is some time in the future. Then, instead of waiting in line, they can do other activities and not show up until the system is ready for them.

This is the philosophy behind restaurant reservations. It is how entertainment parks sometimes handle the long lines for rides: as people sign up, they are given an electronic device that lets them roam freely, doing other activities, but that will call them back in time for them to get to the ride just as it is ready to receive them. Restaurants do this with waiting patrons: sign up at the counter and get a paging device. When your table is ready, you are paged, and the resulting buzzes, light flashes, and vibrations notify you that it is time to collect your party and go get seated. These systems all have their own set of problems, but all of them are design efforts to get around the long, uncomfortable lines.

Contrast Disney where you can get a special pass, the Fastpass, to avoid lines. Everyone is entitled to this, but only one pass can be held at a time. It doesn't let people go ahead of the line: it is a guaranteed service time. Here is how it works. When people get to the ride, a sign tells them at what time the Fastpass slot will become available. If they decide to get a pass, assuming they are eligible, they can then do anything they wish and as long as they come back to the ride within an hour after the printed time. They still have to wait, but most of that time is spent wandering the park, perhaps even taking other rides (for which they will have to wait in line because of the restriction of only a single Fastpass at a time).

When the people return to their Fastpass ride and get into the special line, it is short and fast. Moreover, other people who might be waiting in the longer, regular line, do not feel cheated: they know that they too had a choice of getting a Fastpass but chose not to. It is very important for this perception of fairness that only one Fastpass ticket is allowed at a time. This is enforced rather simply: the admissions ticket to the park is inserted into the Fastpass machine which allows it to identify the customer and eligibility status, then returning the park admissions ticket and printout a Fastpass only if the customer is eligible for one.

In a neighboring theme park, Universal Studios Orlando, people with more money can purchase a "jump ahead" pass that can be used for any ride at any time. This pass causes resentment. One person whose family had visited both Disney and Universal on the same trip explained that the Disney system seemed fair and equitable whereas he and his family were quite annoyed at Universal: "the rich get to go first," he said, "and that isn't fair." Harpo, the screen name of someone writing on the Atari community forum called it "obnoxious. I resent that only those who are willing to shell out more money after already paying for admission are able to use them." These schemes are not fair to those who have traveled great distances to enjoy the parks, but don't have much money. It does not lead to the perception of fairness. It does not lead to a positive memory of the experience.

Providing Positive Memories

Principle eight is that the memory of an event is more important than the actual experience. Numerous studies of memory indicate that it is an active reconstruction of the experience, which means that it is subject to many possible distortions. In the legal profession, the unreliability of eye witness testimony is well known and many psychological experiments have shown how easy it is to distort one's memory for events. Consider the woman who remembered with great pleasure her visit to Disney World in Orlando, Florida, recalling the wonderful Disney characters she interacted with: Bugs Bunny, Cinderella, Mickey Mouse. Except that Bugs bunny is not a Disney character, and therefore could not have been part of her experience. She had taken part in a psychology experiment where she had been shown an advertisement for Disneyland that showed Bugs Bunny⁵. A simple showing of a false advertisement can modify memory.

Bob Sutton, Professor of Management Science and Engineering at Stanford University has suggested that an important component of participants' memories of an event comes through the photographs they took⁶. Thus, by providing photographic moments in the line - for example the family happily engaged with one of the park's costumed characters - the record the family brings back with them contains the positive moments of the visit, so with each viewing of the pictures, the family enhances their positive memories without reawakening the negative ones. After all, it is easy to photograph smiling, happy events, but not at all easy to capture the agony of waiting in line. Besides, what family photographs their negative experiences?

Waiting in line is never an end to itself. It is always done in order to gain access to something else. The memory for the line can be enhanced both by adding

positive experiences during the wait that can later be remembered, but also by making the events at the line's termination be incredibly positive, as well as by making the event gotten to by the line be well worth the effort. In fact, through the psychological mechanism known as "Cognitive Dissonance," the suffering actually enhances the enjoyment of the later event (although the dissonance reduction is subconscious, think of it as the subconscious deciding "any event that requires so much effort to enter must really be important and wonderful"). Cognitive dissonance was first proposed in the middle of the 20th century by Leon Festinger to explain how people manage when events contradict a core, strongly held belief. To Festinger's initial surprise, such contradictions often seemed to enhance the belief, rather than demolish them. The theory of cognitive dissonance explains why this might happen⁷.

Some of the discussion in principle 5 about the importance of filled time might appear to contradict principle 8. In that discussion, I pointed out that although filled time passes more quickly than unfilled time, it is remembered as having taken longer than dull, boring empty time of the same physical duration. True, but if the events are positive ones, then the memory is of a positive experience in the line, where the amount of time is of less consequence. All things considered, positive memories outweigh almost everything else.

VARIATIONS ON THE THEMES

Although the examples just provided came from a restricted set of industries, the same principles apply to all service situations where there are more customers than can be handled without requiring some to wait. Still, there are numerous variations on these themes and, obviously, some industries and situations require specialized techniques to deal with their issues.

In some situations, perhaps dump trucks at a mine or construction site or ships in a harbor, the wait has considerable cost, both economically and environmentally. Pilots and other workers have legally proscribed limits on how many hours they are allowed to be active at a time, and if they wait too long, it may not be possible for them to do their jobs when their wait is over. Trucks and ships entail both labor and fuel costs during their waits.

Where there is a complex mix of services required by those waiting, it is useful to segregate them into more homogenous groups. This simplifies the scheduling so that there are not sudden unexpected long latencies. It also allows for specialization at the server side, so that people expert in a set of services can be deployed efficiently for those who need that expertise. In some situations, the queues are easily segregated by problem type (as in motor vehicle registration offices which have separate lines for different services). In some situations, each person is quickly processed by a greeter who assess the nature of their needs and assigns them to the appropriate queue. In medicine, this is the role of triage, where cases are prioritized according to the seriousness and urgency of the condition, the critical incidents are dealt with first, the less urgent consigned to the waiting room.

Some airport security lines have even experimented with self classification deliberately modeled after the classification of skiing trails, even including traditional skiing color codes: black for experts, blue for intermediates, and

green for beginners. Here is how the American Transportation Security Administration (TSA) describes their experiment⁸:

In the TSA version, the green lane is for families traveling with children or people who need special assistance. These folks may not travel that often and need extra help with the procedures and assistance navigating security. The blue lane is for casual travelers who are somewhat familiar with the procedures and have multiple carry-ons. The expert, or black diamond lane is for those who know the procedures well and always arrive at the checkpoint with appropriate items removed and limited carry-on luggage. The security standard is the same no matter what lane you choose. However, efficiency is increased by allowing passengers to proceed at their own pace.

We are enhancing security by creating a less stressful experience. This enables our officers to provide better support to the people who need it most, while others are able to navigate the checkpoint more expeditiously," said Earl Morris, TSA federal security director at Salt Lake. "Passengers will ultimately determine the success of the pilot."

In security lines, where greatest problems are often caused by people who do not know what to do, thereby slowing everyone else up. Will self selection work, or will the same people who do not know the ritual of security checks also fail to understand the self-selection process, thereby clogging the expert lanes? The experiment is worth trying, and the results might very well work well in some industries or situations, not in others.

Security lines also face the same problems as cafeterias, where buffers and room for unloading (unpacking), then being serviced, and then repacking or reloading. But even though the same principles apply, modifications are required for the situation. Security lines, for example, seldom provide sufficient buffer space for unloading carrying cases and personal possessions (which includes partial disrobing of shoes, belts, jewelry, and jackets, placing different categories of items in different inspection bins, then being inspected, and afterwards the room and space to pack and load everything back together again.

Even with all these variations, the basic principles are the same. Mathematical models can help deploy the proper amount of people, but psychological principles are required to make the experience pleasurable, or at the very least, endurable.

DELIBERATELY INDUCING WAITS

Although waiting is universally disliked, there are times when it is useful to induce waits artificially. Traffic lights are a good example of introducing a deliberate wait for one set of vehicles, the better to permit other vehicles or people to gain access.

In theme parks the waits are deliberate. "What else would we do with the people?" I was once told by a high-level executive of one of the major theme park companies. "It is too expensive to add more rides." Waits are unavoidable when there are more people than resources, so in this case, although the

waiting was deliberate, the company's response was to make those waits as enjoyable as possible.

Waits can be used to enhance pleasure. We wait until dinnertime to eat, both for cultural reasons and also until we are again hungry. We deliberately refrain from opening gifts before the allotted time, the enforced waiting helping to enhance their value. We sometimes welcome waits, for they allow time to savor the moment, or to read, finish a conversation, or complete a desired activity. Some waits at the start of an activity are beneficial, allowing us time to prepare. At restaurants and even fast food places, the wait gives us time to study the menu and decide upon our choices.

There are times when waits are too short, when we are forced to respond before we are ready, or when we did not have enough time to finish the interim activity.

Waiting can sometimes be of value when the activity being waited for is distasteful. The longer it is delayed, the better, perhaps even giving hope that it might be postponed or cancelled. In general, however, prolonging the wait means prolonging the state of uncertainty, which is an emotionally bad place to be.

Waiting is a necessary part of life, often negative and disliked, but sometimes a positive part, anticipated and enjoyed, as when a friend joins you and says "I'll wait with you: keep you company while you wait."

DELIBERATE CHAOS

In some cultures, the notion of a structured waiting line does not apply. Structured situations are those where people respect the rules and behave in an orderly fashion, not breaking into an existing line, not trying to get ahead, and waiting for their turn. In some places, it would seem that the loudest person gains the service, which might be interrupted partially through the process by attention being switched to someone else who was even more assertive, louder, or brash. Culture, in this sense, does not simply refer to differences between nationalities or geographical areas, but even to differences from establishment to establishment.

Some countries seem not to understand the notion of structured lines. Hence, McDonald's need to educate their customers when they first opened their stores in Hong Kong (page 00, this chapter). But even in countries with well-established waiting cultures, some situations do not use them. Markets, bars, and some shops allow an open floor situation where the loudest and most aggressive get served first (they would not describe it this way, but that is how it seems to onlookers). As one of my correspondents put it: "In the back of my mind I do have the picture of a crowded bar on a Saturday Night that serves beverages." One waiter or bartender to many customers, where well-known customers are apt to get served first, and where everyone else has to weave their way to the front, oftentimes by feints and other ruses to get ahead of other people, all in hope of attracting the bartender's eye.

My wife and I enjoy the food at a fish restaurant in San Diego that is utter chaos. The restaurant serves sandwiches and food on paper plates, which one takes outside to eat, overlooking the boats, birds, and seals in the harbor. But we refuse to go there whenever we think it might be crowded because we get so frustrated with the chaos and inability to figure out how to work the system. (In other words, we can never eat a meal there at meal time.)

Breaking the Rules

Even individuals who believe in structured waiting often devise techniques for getting ahead, but still within the spirit of the system. One way is for a person to “hold a place” in line, allowing some number of friends to suddenly appear and join the line midway. Sometimes this is just done, without asking, sometimes the one person behind is asked if this is permissible. One can even ask the person in the place ahead if it is permissible to have others in behind, even though this has no effect upon that person. As a result, the answer is likely to be “yes” and the asker can claim to have received permission. Of course, the people far back in the line are annoyed when the line keeps getting longer and longer in front of them.

Another scheme is for members of a group to split up, each joining a different line, and then all the other join the winning line, once it is clear which one that is.

Another, less onerous, scheme is to hire a stand-in to wait in line, then replace the person as the turn comes close (the person can even wirelessly say when the time is arriving). This is usually more permissible than the other schemes because the total number of people in the line does not change.

The telephone is also effective. Clerks will often answer the telephone before waiting on customers, so calling is often better than waiting, depending upon the kind of service being requested of course. I have seen people in lines doing this, thereby playing one waiting time - the physical line - against another - the call waiting lie.

Many a social psychologist has studied the impact of line-breakers upon the rest of the people in the line. As you can imagine, the study possibilities are endless.

WHEN WAITING IS HANDLED PROPERLY

I often ask people about their experiences which includes numerous situations where people have to wait on line. Waiting for a train, waiting for a restaurant table, waiting in line to be served at a university cafeteria. All these waits were accepted as reasonable and fair. Waits that were deemed unreasonable were often those where fairness was violated or where the rules of behavior not well stated.

Thus, at a complex movie theater, with many ticket sellers, but no clear lines, people felt that they were unclear how to behave and as a result, not happy with the experience. The same comments were heard from a lineup of people

waiting to be served at a market place. It was unclear how to behave and it always felt that people who arrived later were being served earlier. The uncertainty produces anxiety and other negative emotions. Those who know how to maneuver in such situations may feel a certain amount of pride and their ability to get served, but these positive feelings on the part of some are not worth the negative feelings on the part of others. Note too that you cannot assess the negative feelings by asking those who are waiting to be served. The people who feel the most strongly negative are apt to have stopped attending.

This is yet another example of one of my standard marketing beliefs: there are always more non-customers than customers. If you want to understand how people feel about your product, study non-customers, especially those who are customers of your competitors and would therefore be likely candidates for you.

A clear solution to the crowd problem, especially where lines are not possible, is to hand out numbers, then wait on the people by number. The issuance of numbers solves several problems, as has already been discussed in the section on "number assignment," above. But a different reason for using them in situations where lines are not appropriate is that it provides a clear and fair method for getting service, providing guidance to those new to the situation and ensuring fairness of treatment for all.

The pleasantness of the wait can also be manipulated by adding distracters - tasks to occupy people. Waiting rooms provide magazines and television. Some banks have tried television screen for those waiting in lines. It is rumored that waiting for elevators has been made more pleasant by adding full-length mirrors by the elevator area, so people can examine themselves while waiting. Disney - and other theme parks - sends entertainers to amuse those in line.

Disney theme parks are probably the champions at handling the dislike of lines. When I ask people about their trip to a Disney theme park, I ask two questions: What did you dislike most? Would you go again? The answer to the first question from people all over the world, the United States, Asia, and Europe, is immediate: The lines, the queues, the waiting, the description varying with the location in the world, but the content always identical, always immediate, without any need for thought. People dislike the lines. But the answer to the second question is much more revealing. "Would you go again?" Yes comes back the answer, once again, immediate, without any need for thought. People may dislike the lines, but Disney handles them so that they feel appropriate, fair, and manageable. Remember, memories are what count: make sure they are pleasant.

It's all a matter of design.

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¹ (Maister, 1985)

² Prof. Robert Sutton, Stanford University. Email, July 3, 2008.

³ (Kahneman, 2003)

⁴ (Cultural globalization, 2008)

⁵ (Braun-LaTour, LaTour, Pickrell, & Loftus, 2004; Braun & Loftus, 1998; Sacchi, Agnoli, & Loftus, 2007)

⁶ (Sutton, 1992)

⁷ (Festinger, 1957)

⁸ (Transportation Security Administration, 2008)