The topic of crisis remains relevant. During this study's writing and editing process, the COVID-19 coronavirus disease appeared on the world's stage. Further, it is uncanny that in the final stage of the study's 2021 publication, the United States Atlantic Seaboard experienced a gasoline shortage after a cyberattack disabled a major pipeline resulting in crisis lines at gas stations. The study compares the mood of drivers waiting in line for a necessity in a national crisis, in this case, gasoline, during the oil shock of 1979 in the United States to those not waiting shortly after the crisis ended. It also examines how position in such crisis lines affects mood. All subjects answered yes-no adjective questions for anxiety, hostility, and positive affect. Line position was determined by counting the number of cars from the pump. Those waiting showed more hostility, anxiety, positive affect, and uncertainty than those not in line. During the crisis, those farthest from the pump showed greater hostility and less positive affect than those closer, but no difference in anxiety, with uncertainty moderating positive affect but not anxiety or hostility. The crisis occurred at a time when smartphones did not exist. The results suggest smartphones during a crisis would probably have their most significant positive impact if used to reduce uncertainty in fulfilling consumer information needs. Crisis, by its nature, is an unpredictable phenomenon that may explain why there are far more studies of the routine lines encountered in daily living, such as those at airports or call centers, than those experienced in crisis.

INTRODUCTION

Waiting in line is a common and pervasive situation though such waits can be both unpredictable and predictable (Zhou & Soman, 2003) with differing consumer approaches and resolutions. For popular movies, some patrons plan when to attend in order to avoid the lines and go during off showings. When lines cannot be avoided as might be the case for a famous New York City Broadway show on a Friday or Saturday night, patrons have waiting built into their expectations, well adapted to what is to come, confident in their understanding of how the system works. However, in other situations, customers can encounter an unexpected wait. For example, a favorite restaurant is suddenly busy, or some crisis or condition produces new lines.

Indeed, some lines are expected as a part of daily living. What was once a simple walk to the gate at airports has been supplanted by traveler congestion (Kim & Park, 2016; Rizzo, 2018).
Similarly, call centers can involve waiting in a phantom line, not a physical one, but unlike airports, call centers began with considerable delays in the eyes of those who waited (Taylor, 1994) and continue to yield hold times that frustrate callers and produce anger (Ganguly, 2009; Molino et al., 2016). The anger over call center wait times is so palpable that speech recognition software has been suggested as one way to pinpoint those in need of quicker attention (Lee et al., 2008), though music while on hold is no longer thought to be the best approach for reducing hostility (Niven, 2015).

One common theme has emerged from this body of research on "waiting in line." Quite simply, those waiting, whether in an actual physical line or on a telephone, do not tolerate long waits (Katz et al., 1991). A related theme is that long wait times negatively impact the perception of service quality (Chebat & Filiatrault, 1993; Djelassi et al., 2018; Maister, 1985; Tom & Lucey, 1995; Yu et al., 2019).

A third theme, and the one most relevant to this study, is that lines trigger emotion. Waiting in line produces negative feelings of hostility, anger (Casado Diaz & Mas Ruiz, 2002; Foersterling, 1984), and anxiety (Dube-Rioux et al., 1989). Indeed, it is not uncommon to see in the media considerable violence in lines for necessities such as those for gasoline during Hurricane Sandy in the United States (Wilson, 2012). Similarly, delay in service delivery, which can be the culprit behind a long line, has also been found to foster anger (Kim & Park, 2016; Weiner, 2000). However, some believe lines can also foster positive emotions (Katz et al., 1991; Larson, 1988), even patience (Dai & Fishbach, 2013). Thus, it seems lines can impact mood negatively and positively.

Still, despite a relatively long history, research on lines has not investigated those that sprout up in crisis, possibly because such lines come and go. The hurricane ends, or the embargo on a critical good is lifted. We refer to such situations as involving "crisis lines." Unlike the routine lines typically considered in research on waiting and queues, crisis lines appear out of nowhere, involve a base necessity like food or water, and a situation where lining up may not deliver what is needed. Also, those waiting in crisis lines have little experience with the rules of engagement, unlike routine lines where experience has often taught how to deal with the call center, negotiate security at an airport, or wait in line for a bus or restaurant seating on a Saturday night.

Other reasons for the limited study of crisis lines could also include the simple fact that those who might study such lines are often busy negotiating the crisis themselves, using their free time to manage their own success in a line, too busy in the lines to study the lines. Like their possible subjects, they are in the thick of it, and even if the thought of study comes to mind as they wait with everyone else, the crisis ends. The line disappears almost as magically as it appeared, soon only a remembered negative experience, talked about for months, years, but not studied.

In fact, crisis lines, unlike routine lines, have many unpredictable qualities, including the possibility the line will be gone the next day or the commodity sought will run out. Because crisis lines impact consumers, one might ask what we know about their impact on the mood of those who wait. As noted earlier, the surprising answer is little. Thus, this study does what is rarely if ever done. It considers data collected on the mood of drivers waiting for gasoline in the United States during the 1979 oil shock (Ito & Nga, 1994; Verleger et al., 1979). During this second petroleum crisis of the decade, drivers were thrust into lines during the late spring and summer of 1979 based on even-odd license plate numbers and maximum purchase limitations (Little, 2000).

With another crisis upon us, it seems an opportune time to examine the effect of such lines on mood for those who wait. Fortuitously, the investigators rediscovered the data considered in this
study in an office trunk. Suddenly relevant, abruptly irrelevant, then relevant again, crisis lines find no regular home in research. Now in the “relevant” phase once again, facing the potential impact of a new crisis on supply, that of the coronavirus, and the potential for new lines, this recently discovered data seems as important as when it was first collected. The results provide guidance on how mood is impacted in crisis lines and offer possible approaches for improving mood in such lines should they arise during any crisis.

LITERATURE REVIEW

The impact of lines on mood and emotion has been studied though rarely during a crisis in field settings. It has been argued that dissatisfaction and other emotional reactions emerge when a discrepancy exists between what an individual wants and what he or she perceives as obtainable or actually obtained (Izard, 1977; Locke, 1976; Spielberger, 1975). Waiting is often perceived as an obstacle (Quigley et al., 1984) and typically results in negative feelings (Martin et al., 1993). Anxiety, for example, appears in such situations often due to uncertainty about how much longer one must wait and increasing opportunity cost (Dube-Rioux et al., 1989). Indeed, delays in service delivery began increasing decades ago (Taylor, 1994).

Though not of the crisis variety, research on service delays in airlines has been shown to foster negative emotions (Bacena et al., 2020; Kim & Park, 2016), and not surprisingly, security screening at airports can impact traveler satisfaction as well as feelings of safety (Sakano et al., 2016). In a similar vein but an experiment, not one based on a survey, Hui and Tse (1996) showed consumer mood was negatively affected by waiting for service delivery and mediated perceptions of service quality. They also showed negative consumer perceptions could be attenuated for those in their study’s intermediate-wait and long-wait conditions by providing subjects with wait-duration information as a means of reducing uncertainty.

Stress (Iwata, 1994; Kocas, 2000) and anger (Foersterling, 1984) can also result from lines. One need only follow the media to see the palpable hostility and frustration that can result from waiting in line for something critically needed like gasoline. During the crisis resulting from Hurricane Sandy in the United States, tensions boiled, and guns surfaced at the gas pumps (Wilson, 2012). Though it is not possible to assess beyond anything anecdotal, there is nothing to suggest that cell phones moderated the hostility and anxiety that resulted from waiting in gasoline lines during that crisis. Cell phones might alleviate the boredom but provide no assurance one will fulfill one's goal (that is, receive enough gasoline). Its availability has done little to reduce anger at airports when there are long delays (Kim & Park, 2016).

On the positive side, some argue that waiting in line can lead to bragging rights (Gibson, 2008) and might even result in positive affect possibly from surviving the daunting task of the long line or ending up in a line that turned into a favorable social situation (Katz et al., 1991; Larson, 1988). That said, gasoline crisis lines are not about waiting and mingling since this is not feasible in a carline. It is likely a problematic situation has developed if drivers leave their cars. Likewise, Maister (1985) notes that satisfaction can result from a shorter line when the only choice is to wait and queue, and Loewenstein (1987) suggests that under certain circumstances, waiting can increase the expectation of pleasure from the future event, that of receiving the goal.

Another positive finding for lines comes from Dai and Fishbach (2013) who found lines might develop patience. Though in a lab study of students, not of those in a crisis situation in a real-world setting, they found waiting can improve patience, especially for hedonic products (e.g., chocolate)
as distinct from utilitarian products (e.g., USB flash drives). Since gasoline is far closer to a utilitarian product than a hedonic one, it is conceivable patience does not develop in lines for such a needed commodity though the notion that patience might develop over time is an interesting one.

Still, it appears hostility lurks just below the surface in all lines, as can be quickly seen when intruders violate the social norm of "first-come, first-served" (Ahmed, 1982; Harris, 1974). Though Oberholzer-Gee (2006) found some tolerance for cutting into lines in a study of cafeteria lines for food, mainly serving students, the generosity did not last long. Hostility quickly emerged in response to violating the social norm when those waiting perceived a non-exceptional violation.

For crisis lines, however, it is doubtful there would be any tolerance for breaking in line as occurred in this study of cafeteria lines involving mainly students, albeit short-lived. Those waiting farther back would not understand the exception and would ultimately become the most upset. They might even resort to violence. Such a negative reaction would be consistent with the notion of punishment for those violating public norms (Fehr & Gachter, 2000).

In a similar vein, Clemmer and Schneider (1989) found waiting time in a field experiment was strongly correlated with unhappiness and customer dissatisfaction. However, they also found that customer perceptions of what happens in a service facility rely more on what customers believe happens than what actually happens. In such cases, uncertainty moderates the emotional reaction. Indeed, the notion that uncertainty prompts negative emotions applies to many fields. For example, research in finance (Pixley, 2012) has shown uncertainty reduction decreases negative mood and increases positive affect and decision affect theory (Mellers, 2000) suggests surprise from uncertainty causes greater emotional intensity, a surprising negative event more painful, a positive event more pleasurable.

Still, it does not appear that a physical line is necessary for satisfaction to be negatively affected. Even less physical queues like those involving call centers, where one might sit in the comfort of their home or office and never see a line, create an invisible queue in the mind of those who wait. This, in turn, affects customer satisfaction with the anticipated delay impacting whether a customer will abandon a call or call again (Yu et al., 2019). As to the source of negative mood in lines, it is likely the mere restriction on fulfilling needs accounts for much of the increased anxiety and hostility though for crisis lines the possibility that the need might not be fulfilled at all is likely another source of negative emotion. In this regard, Taylor (1994) showed waits that resulted from less-than-clear delays in airline service resulted in frustration, uncertainty, and anger.

In addition, it appears distance from the goal can negatively impact mood. While it is rare for study of lines in field settings to focus on mood, much less line position, Meyer (1994) considered 144 subjects waiting in line for an artistic event in Paris and found mood was less positive for those at a greater distance from entry.

Thus, lines, whether involving a physical presence or a mental state, influence mood as well as customer satisfaction. While one point of the current study is that routine lines, such as those studied in the research noted above, may only be similar on the surface to the crisis lines considered in this study, research on routine lines offers a starting point for generating hypotheses about crisis lines and may have a similar impact on mood. It appears both negative and positive moods can develop from waiting in such lines.

Similarly, while an essential ingredient of crisis lines is waiting and potentially not having a need fulfilled, some routine lines can pack a similar negative punch. One can stand in line for a bus, watch a full bus pass, and be forced to wait for the next one. Likewise, one can have their eye on the "tastier" airline dish only to see it run out farther back in coach. Regarding distance from
the goal in a physical sense, the general tenor of the limited research on the topic suggests negative mood will increase as one's distance from the goal increases.

PURPOSE OF STUDY AND HYPOTHESES

The current study makes use of data collected in 1979 from those waiting in line during the great gasoline crisis in the United States. This was the second such crisis for the country in just a few years (Powell, 2005; Time, 1979; Witt, 1979). Many lines resulted from the imposed rationing and are of the classic crisis type because no matter how long one waited, they could reach the station and be turned away with the dreaded phrase, “no more gasoline.” Data was also collected after the crisis from those who obtained gas without a wait.

Specifically, the study compares the mood of those who waited in line during the gasoline crisis to those who did not wait after it. Three moods are considered: anxiety, hostility, and positive affect. It also investigates how position in line relates to these three moods and the extent to which uncertainty played a role in mood.

We refer to such queues as crisis lines because they are different in many ways from the routine lines encountered during daily living. They are important to understand for public policy and business reasons, including what one might expect as the owner of any operation confronted by lines, rationing, and a new crisis. Such emergent lines often occur with no social structure, no prior experience on the part of those waiting, and result in considerable uncertainty. They differ from many routine lines, including those at airports though frustration, negative mood, and uncertainty can also occur in routine lines.

The research and theory noted above suggest how mood might be affected in a crisis line though none have studied such a line. We are also not aware of any study that compares those waiting in line to those not waiting for any product or service, much less a crisis line. It seems likely that hostility and anxiety will increase, especially when the crisis line is seen as a barrier to achieving critical goals. However, frustration over the poor use of time while waiting might also contribute to this result.

Similarly, there is the possibility of positive affect in lines. Earlier research indicates positive mood might increase as one comes closer to goal fulfillment with one soon to have their goal fulfilled after waiting in line. This suggests those farther from the pump will show less positive affect than those closer. It is also not inconceivable that obtaining a needed commodity when one is not in line could result in no feeling at all, no anxiety, no hostility, and minimal positive affect. Lines churn out emotion. A no-line circumstance may do nothing to mood. Thus, it is possible those in line will also show more positive affect than those who do not wait.

Regarding uncertainty, the research noted earlier suggest uncertainty in need fulfillment can result in negative emotions, and its reduction can improve mood and disposition. Its role is well-documented in marketing and finance research and studies of decision affect theory.

Thus, we believe anxiety, hostility, and positive affect will be greater for those waiting in line than for those not waiting. We also believe that position in line will be associated with mood, anxiety and hostility increasing with distance from the pump (the goal) and positive affect decreasing with distance from the pump. Last, it is likely uncertainty over need fulfillment will be greater for those waiting during the crisis than those not waiting and will be associated with greater negative mood and a reduction in positive mood for those waiting.
As a result, eight hypotheses are tested. In the first three hypotheses, we predict anxiety, hostility, and positive affect will be greater for those waiting than for those not waiting. In the next three hypotheses, we predict anxiety and hostility will increase with distance from the pump, the final source of need fulfillment, and positive affect will decrease. In the last two hypotheses, we predict uncertainty will be greater for those waiting and play a role in mood for those waiting. The hypotheses are:

**Hypothesis 1:** Anxiety will be greater for those waiting in line than for those not waiting.

**Hypothesis 2:** Hostility will be greater for those waiting in line than for those not waiting.

**Hypothesis 3:** Positive affect will be greater for those waiting in line than for those not waiting.

**Hypothesis 4:** Anxiety will be greater for those farther away from the pump than for those closer to the pump.

**Hypothesis 5:** Hostility will be greater for those farther away from the pump than for those closer to the pump.

**Hypothesis 6:** Positive affect will be less for those farther away from the pump than for those closer to the pump.

**Hypothesis 7:** Uncertainty over gas station policies will be greater for those waiting during the gas crisis than for those not waiting after the crisis.

**Hypothesis 8:** Uncertainty over gas station policies will be associated with mood for those waiting in line during the crisis.

**METHOD**

**Measures of Mood**

Mood was assessed through the use of 32 questions on how drivers felt using items from the Multiple Affect Adjective Checklist (MAACL) (Zuckerman, 1960) and the Profile of Mood States (POMS) (McNair et al., 1971). Items from the MAACL assessed positive affect (10 items) and anxiety (11 items). For hostility, 11 items from the 62-item POMS were used. The checklists were "yes" or "no" in format. Drivers either said yes or no to each item. There was no time for added complexity.

The questioning began with a positive affect item (calm), followed by an anxiety item (afraid), followed by a hostility item (angry), and then continued alternating in the same manner, positive, anxiety, hostility, until all 32 items were answered. The positive affect items were in this order: calm, cheerful, contented, happy, joyful, loving, pleasant, secure, steady, and thoughtful. The anxiety items were in this order: afraid, desperate, fearful, frightened, nervous, panicky, shaky, tense, terrified, upset, and worrying. The hostility items followed the order of angry, peeved, grouchy, spiteful, annoyed, bitter, ready to fight, rebellious, deceived, furious, and bad-tempered.

Since the mood checklist involved yes or no answers, the level of anxiety, hostility, and positive affect experienced by subjects was measured by counting how many times a driver endorsed an item. The maximum scores were 11 for anxiety, 11 for hostility, and 10 for positive affect.
Uncertainty Measurement

During the crisis, stations used their own policies in the shadow of minimal government intervention, which mainly involved an even-odd license number requirement for when drivers could queue for gasoline. Beyond this even-odd system, stations could (and did) alter policies in favor of their own customers, fail to open and close at posted times, and, of course, run out of gasoline prior to a driver reaching the pump.

Given the limited time available for driver questions and to avoid being drawn into discussions of government policy and the like, one measure of uncertainty was used, framed as a "yes" or "no" question. Specifically, drivers were asked: "Are you aware of the gas policies of this station?"

Sampling and Procedures for Line Condition During Crisis

A male experimenter surveyed 101 drivers, while they waited in line for gasoline. The survey was done at the height of the gasoline crisis in June 1979 on a weekday at various times throughout the day, including early morning (6:12 a.m. to 7:14 a.m.), morning (8:10 a.m. to 9:00 a.m. and 9:10 a.m. to 11:50 a.m.), afternoon (12:45 to 3:50 p.m.) and late afternoon (4:40 to 5:20 p.m.). The survey locations were four frequently used gasoline stations in a quasi-suburban area outside New York City, not truly urban, not fully suburban. The stations were proximal to each other, no more than a mile apart, allowing the investigator to collect data more easily during the crisis by walking to each.

As was typical, stations were not open to serve gasoline all day, closing at very specific times (e.g., morning or afternoon), turning away customers if any arrived at the pump after closing time, no matter how long they waited in line. It was expected drivers would know station policies and queue with the closing time in mind and recognize the even-odd license plate requirements and the possibility the station might run out of gas.

However, stations were open for car repair before and after the posted gasoline sale times with drivers able to easily see continued activity at the stations before and after the access hours for gas. Though buyer behavior varied, it was not uncommon for drivers to line up before a station's opening time.

The length of lines at the stations ranged from a maximum of 83 cars to a minimum of 49 cars, or up to a quarter mile of cars. Drivers at various representative positions in line were approached, near, moderate, far, in a standard manner. The investigator walked up to the driver and asked if they would assist. None refused. After agreeing, the investigator told drivers their position in line and asked them to answer the study questions.

Sampling and Procedures for No-Line Condition After Crisis

Two months later, in August after the crisis ended, the investigator returned to one of the stations and surveyed 85 additional drivers as they obtained gasoline. There were no cars in line, only the driver in one car. Though no driver turned away the investigator, it took more persuasion to garner answers to questions when there was no wait.

So as not to bother station management, long frustrated by the crisis and lines, the investigator collected the no-line data over the course of two weeks on weekdays at varied times throughout the day, often conversing with station employees about the importance of the study. Coordination was essential for those not waiting in line as answering the mood questions took about the same
time as it took to fill a tank. Unlike those waiting in line who had much time to respond, drivers not waiting could leave.

**RESULTS**

**Gender and Occupation of Subjects**

Gender was assessed for both groups and was identical. The gender for those in line during the crisis and not in line after the crisis was 53% male and 47% female. Both groups were also compared on employment status, with 76% and 66% indicating they were employed, either as a manager or non-manager for the line and no-line groups, respectively. Those not employed noted they were students, homemakers, or unemployed and represented 24% and 34% of the line and no-line groups, respectively. These differences in employment status were not significantly different ($\chi^2 = 2.43, p > .05$).

**Reliability of Mood Scales**

Alpha was used to assess the internal consistency of the three scales as its application results in a reliability coefficient that is equivalent to the Kuder-Richardson 20 (KR20) approach for determining the reliability of dichotomously scored or binary data (Barrett, 2007). The Alpha results are .84, .88, and .78 for anxiety, hostility, and positive affect, respectively, exceeding the minimum standard of .70 suggested by Nunally (1978, p. 245).

As an added check on reliability, the internal consistency of each scale was assessed separately for the line and no-line groups. The line group showed Alphas of .86, .87, and .79, while the no-line group showed Alphas of .72, .77, and .71 for anxiety, hostility, and positive affect, respectively. Since none in the no-line group endorsed the anxiety items of afraid, desperate, and terrified, the Alpha shown for anxiety for those in the no-line group reflects the remaining eight items. All measures meet the .70 standard in both groups.

**Comparison of Line and No-Line Groups on Mood**

Table 1 shows the number of items endorsed by the line and no-line groups for anxiety, hostility, and positive affect. An independent t-test using separate variance estimates was used to test the differences between the two groups due to significant differences in variance between the line and no-line group ($p \leq .001$). The separate variance t-test has been shown to be robust when normality assumptions are not met, and variance differences are a concern as in the current study (Ruxton, 2006).

<table>
<thead>
<tr>
<th>Mood</th>
<th>Line Mean</th>
<th>Line Range</th>
<th>Line SD</th>
<th>N</th>
<th>No Line Mean</th>
<th>No Line Range</th>
<th>No Line SD</th>
<th>N</th>
<th>t Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety</td>
<td>1.91</td>
<td>0-11</td>
<td>2.5</td>
<td>101</td>
<td>.51</td>
<td>0-6</td>
<td>1.10</td>
<td>85</td>
<td>5.03***</td>
</tr>
<tr>
<td>Hostility</td>
<td>3.47</td>
<td>0-11</td>
<td>3.2</td>
<td>101</td>
<td>.61</td>
<td>0-7</td>
<td>1.31</td>
<td>85</td>
<td>8.23***</td>
</tr>
<tr>
<td>Positive Affect</td>
<td>4.73</td>
<td>0-10</td>
<td>2.8</td>
<td>101</td>
<td>3.11</td>
<td>0-9</td>
<td>2.20</td>
<td>85</td>
<td>4.47***</td>
</tr>
</tbody>
</table>

***Difference significant at .001 level.
Specifically, those waiting in line showed a significant difference ($p < .001$) in mood as compared to those not waiting. Those waiting were more anxious and hostile than those not waiting, supporting $H1$ and $H2$, respectively. Also, those waiting showed more positive affect than those not waiting, supporting $H3$, which suggested positive mood would be greater in lines than in the far more neutral situation of no line.

Despite these significant differences, those waiting cannot be characterized as a group full of anxious and hostile drivers since the average level of endorsement is less than half the maximum possible for each measure though some individuals in the gas lines exhibited rather high scores on both. In contrast, no driver in the no-line condition showed high scores for anxiety or hostility, with none scoring greater than six for anxiety or greater than seven for hostility out of the possible maximum of 11. For positive affect, both those waiting in line and not waiting in line showed a broad range, with those in line showing scores from zero to 10, the maximum, and those not waiting scoring from zero to nine.

Summarizing, $H1$, $H2$, and $H3$ were supported. Those waiting in line showed greater anxiety, greater hostility, and more positive affect than those not waiting in line.

**Relationship of Position in Line to Mood**

To assess how distance from the pump related to anxiety, hostility, and positive affect, those waiting in line were split into three groups of similar size to make it easier to visualize line position differences across stations and to simplify the discovery of any possible curvilinear relationship between position and mood. Those at 19 or fewer car lengths from the pump were considered close, while those at 20-45 and 46-83 were deemed to be moderate and far, respectively. Table 2 shows the means and standard deviations across the resulting three groups for anxiety, hostility, and positive affect.

<table>
<thead>
<tr>
<th>Line Position</th>
<th>N</th>
<th>Anxiety Mean</th>
<th>Anxiety SD</th>
<th>Hostility Mean</th>
<th>Hostility SD</th>
<th>Positive Mean</th>
<th>Positive SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Close (1-19)</td>
<td>36</td>
<td>1.72</td>
<td>2.73</td>
<td>2.83</td>
<td>3.38</td>
<td>5.17</td>
<td>2.82</td>
</tr>
<tr>
<td>Moderate (20-45)</td>
<td>33</td>
<td>1.82</td>
<td>2.17</td>
<td>3.61</td>
<td>3.11</td>
<td>5.30</td>
<td>2.77</td>
</tr>
<tr>
<td>Far (46-83)</td>
<td>32</td>
<td>2.22</td>
<td>2.71</td>
<td>4.03</td>
<td>2.98</td>
<td>3.66*</td>
<td>2.44</td>
</tr>
</tbody>
</table>

*Difference in positive affect for far versus close and moderate line positions significant at .05 level.

Though the Kruskal Wallis test can be used to evaluate mean differences in situations where the normality assumption is not met, as was the case across the three groups waiting in line, simulations suggest that ANOVA, the somewhat more powerful test, is not especially sensitive to this violation (McDonald, 2014). Thus, ANOVA was used. No significant difference across the groups was found for anxiety ($F = .352$, df = 2, 98, $p > .05$) or hostility ($F = 1.26$, df = 2.98,
Thus, $H_4$ and $H_5$ were not supported by mean differences. In contrast, ANOVA showed a significant difference for positive affect ($F = 3.77, df = 2, 98, p \leq .05$) across the groups, thereby supporting $H_6$.

The t-test was used to assess the source of differences in positive affect by comparing groups 1 to 2, 2 to 3, and 1 to 3. It showed no difference in positive affect between groups 1 and 2 ($p > .05$) but a significant difference between groups 2 and 3 and 1 and 3 ($p \leq .05$), with group 3 showing less positive affect than groups 1 and 2.

Further analysis of group differences in mood as a function of distance from the pump was conducted to check if a trend existed that might not have been discovered using the more conservative assessment of mean differences by ANOVA. To this end, the Jonckheere-Terpstra test (Rohowsky, 1997) for trends was used. This non-parametric test evaluates whether ordered differences or trends exist in the data resulting from an independent variable (Bewick et al., 2004; Rohowsky, 1997; Toupin, 2017), in this case, position in line. Because this test assumes hypothesized directionality, it can be thought of as a one-tail test (Toupin, 2017). Like the Kruskal-Wallis test, it can be used to assess median differences across groups (Toupin, 2017) but is more powerful (Rohowsky, 1997).

Since the Jonckheere-Terpstra test expects variances to be the same, variance differences were assessed using an F test for the three groups on each mood measure. None were significantly different ($p > .05$). In addition, an examination of the three groups showed their distributions were comparably shaped with the spread of scores similar across the three groups. A normal distribution is not required (Toupin, 2017).

For anxiety, this statistic showed no trend as a function of distance from the pump (Std. J-T Statistic = 1.383, $p > .05$), consistent with the results of the ANOVA, with medians of 0, 1, and 1 for distances of close, moderate, and far, respectively, providing no support for $H_4$. However, for hostility, this statistic showed a trend for it to increase with distance (Std. J-T Statistic = 2.021, $p \leq .05$) as shown by the increasing medians of 2, 3, and 4 for distances of close, moderate, and far, respectively, lending support to $H_5$.

Likewise, the Jonckheere-Terpstra test showed a trend for positive affect to decrease as a function of distance (Std. J-T Statistic = -2.253, $p \leq .05$), adding additional support to $H_6$. As was the case for the statistically significant mean differences found by ANOVA, this trend was primarily due to those far away from the pump experiencing less positive mood, as shown by the medians of 5, 5.5, and 3.5 for distances of close, moderate, and far, respectively.

Thus, for $H_4$, $H_5$, and $H_6$, the results are somewhat more complex than for the hypotheses associated with waiting or not waiting. The hypothesis that anxiety would be associated with distance from the pump ($H_4$) was not supported by analyzing trends or means. However, the hypothesis that hostility would increase with distance ($H_5$) was supported by an analysis of the trend. The hypothesis that positive affect would decrease with distance was supported by both statistical techniques showing a significant trend toward less positive feelings with distance and a lower mean for those farthest away compared to those at a close and moderate distance, supporting $H_6$. 

61
The Impact of Uncertainty on Mood

As expected, those not waiting in line after the crisis showed far less doubt over station policies than those waiting during the crisis. In fact, no one after the crisis expressed uncertainty over policies. In contrast, 54 percent of those waiting during the crisis indicated they were not aware of station service policies resulting in a significant difference between the two groups ($\chi^2 = 64.04, p \leq .001$), thereby supporting H7, which hypothesized uncertainty would be greater for those waiting in line.

For those waiting in line, a t-test was used to compare mood as a function of driver uncertainty. Table 3 shows the means and standard deviations across the two groups. There were no significant differences in variability per the Levene Test ($p > .05$). There were also no significant mean differences for anxiety ($t = .93, p > .05$) or hostility ($t = .68, p > .05$). However, for positive affect, there was a significant difference with those endorsing greater uncertainty in lines showing a lower level of positive emotion than those more certain ($t = 2.23, p \leq .05$).

<table>
<thead>
<tr>
<th>Uncertain</th>
<th>N</th>
<th>Anxiety Mean</th>
<th>Anxiety SD</th>
<th>Hostility Mean</th>
<th>Hostility SD</th>
<th>Positive Mean*</th>
<th>Positive SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>47</td>
<td>1.66</td>
<td>2.32</td>
<td>3.23</td>
<td>3.18</td>
<td>5.32</td>
<td>2.59</td>
</tr>
<tr>
<td>Yes</td>
<td>54</td>
<td>2.13</td>
<td>2.72</td>
<td>3.67</td>
<td>3.19</td>
<td>4.11</td>
<td>2.82</td>
</tr>
</tbody>
</table>

*Difference in positive affect as a function of uncertainty significant at .05 level.

Thus, H8 was supported in part. The negative emotions of anxiety and hostility were not supported. Uncertainty did not relate to either mood for those waiting. However, for positive affect, it was supported, with uncertain drivers showing a lower positive mood than those who felt more certain of gas station policies.

Since positive affect was the only emotion found to relate to both distance from the pump and uncertainty, the impact of uncertainty on the correlation between distance and positive affect was assessed with a partial correlation. The absolute position of drivers was used as the measure of distance (not their placement in one of the three distance groups) to allow for a relatively simple evaluation of uncertainty's impact on mood as a function of distance. For the line group, this ranged from 1 to 83 car lengths and averaged 36.3 with a standard deviation of 24.6.

The resulting correlation between distance and uncertainty was .309 ($p \leq .01$), with increased distance associated with increased uncertainty, and the correlation between distance and positive affect was -.210 ($p \leq .05$), showing distance was associated with lower positive affect. When uncertainty was removed from this relationship, the resulting partial r between distance and positive affect was -.146, not statistically significant ($p > .05$), suggesting the lower positive mood of those farther from the pump was more a function of uncertainty than distance from the pump.

Summarizing, the potential impact of uncertainty on mood during the gasoline crisis is most evident in its possible negative impact on positive affect. Indeed, it appears uncertainty, not
distance from the pump, was the more important factor in the decline of positive affect as drivers sat waiting far from the pump.

**DISCUSSION**

Field research of those waiting in line is rare, especially during crisis situations. Comparisons to those not waiting for the same need are even rarer. This study examines those waiting for gasoline during the great gasoline crisis of the United States (May to July 1979) using data collected in the summer of 1979. There are many negative social implications to the presence of such lines ranging from violence to general dissatisfaction with policymakers (Little, 2000; Witt, 1979).

In this study, crisis lines are defined as those that are not routine or typical. However, they have similarities to waiting in line for transportation, especially for a bus that might fill, or in gaining admittance to planes at an airport where a line might on occasion cause one to miss a flight. However, unlike such routine lines, they are sudden, unexpected, uncertain, and possibly doubly frustrating as a result. Violence occurs in such lines. Under the surface, hostility and anxiety lurk, and not that far under.

To assess the impact on mood in such a line, the one resulting from controls implemented during the U.S. oil shock and gasoline crisis of 1979, the lead investigator asked those waiting in line to consider items assessing their anxiety, hostility, and positive affect. Shortly after the crisis ended, the investigator asked the same questions of those not waiting in line. The investigator also told all waiting their actual position in line to check for differences or trends in mood as a result of distance from the pump. Regarding position, it is important to note there was no guarantee of goal fulfillment as is typical of crisis lines, unlike more routine lines where despite the wait, one is often assured it will result in goal fulfillment. One will check out at the supermarket, see the movie, watch the football game, even catch the plane.

The results are consistent with theories that suggest obstruction of need fulfillment results in anxiety and hostility. Those waiting showed more of both. They are also in keeping with the idea that positive feelings can result from waiting in a line, possibly because positive affect goes up as one comes closer to goal fulfillment. After all, the wait might be worth it. Also, the results show that distance from a goal relates to mood while in a crisis line. Hostility trended up with distance from the pump, and positive emotions trended down, decreasing with distance. However, anxiety did not vary as a function of position.

The results also reflect the uncertainty common to the 1979 gas lines. Even-odd license plate lines were the basis of the rationing system, but it was unclear if all stations paid attention, nor was it clear if stations favored regular customers, whether gasoline would run out, whether one had gauged time in line well enough to assure not arriving at the pump after closure, or whether drivers would be allowed to fill their tank.

As predicted, uncertainty appeared to play a role in mood. Uncertainty was determined by asking one yes-no question about station policies. The validity of the question was assessed by noting that there was no uncertainty over station policies after the crisis. During the crisis, the lead
investigator found patrons at gas stations included new customers searching for gasoline as well as regular customers. This explains some of the increased uncertainty experienced by those waiting and suggests a degree of validity for the simple question.

While this data cannot confirm the causal impact of uncertainty on mood, those not waiting in line after the crisis displayed no uncertainty and experienced lower anxiety and hostility. The potential role of uncertainty showed most for positive affect as uncertainty was correlated with lower positive affect for those waiting in line, and uncertainty, not distance from the pump, seemed to be the driving force in the worse mood for those waiting at a distance. Though the negative emotions of anxiety and hostility were also greater for those in lines, they were not correlated with uncertainty for those waiting.

Thus, the findings suggest efforts to reduce uncertainty in such a situation could enhance mood, most likely improving positive affect but possibly also decreasing anxiety and hostility as neither was present in any substantive way for those who did not wait, and they showed no uncertainty. During a crisis, this can be of considerable importance to managers who wish to improve the mood of customers waiting in line.

In this era of better communication technology, research on how best to provide information to reduce uncertainty is a worthwhile pursuit. Generic announcements often do not offer much valuable information about a specific situation facing a consumer and may be insufficient for reducing uncertainty as was the case during the 1979 gasoline crisis. For the decentralized sale of products like gasoline, it is likely best for each location to provide situation-specific information, as some stations did in 1979 by posting “No Gas” signs. Such information could improve mood and enhance the seller's public image for both online and face-to-face commerce. Even at airports, the public wants uncertainty reduction when they stand in lines and wait (He, 2016).

Of course, much has changed regarding personal communication technology since 1979. Cell phones are ubiquitous. Could it be that the increased anxiety and hostility shown in the lines would be reduced by the ability to communicate? Unfortunately, reports from the media for those waiting in line for gasoline after Hurricane Sandy in the United States suggest not (Wilson, 2012). Violence and guns emerged in the gasoline lines despite no shortage of cell phones. Their mere availability was not enough.

However, as suggested above, providing specific information about events to reduce uncertainty via smartphones, as now occurs more and more in transportation including the New York City subway, might benefit mood. Their wide availability could keep mood from declining, especially in new crisis situations where consumers have little or no experience with emerging lines. In contrast, general announcements would offer little value as it is likely they would be quickly ignored and not reduce uncertainty as soon as consumers come to realize they are so amorphous as to mean nothing for what to do in a specific situation. Fortunately, the capability to target specific patrons is within reach of most individual providers of products and services in this era.

Yet from a research perspective, it is also possible the ever-present smartphone could make the study of lines more difficult and cause those who wait to refrain from participating, too busy
with calls, messages, and videos. The lead investigator eliminated boredom in 1979 and allowed drivers to vent despite some danger, resulting in a 100% response rate, a rare response level by any standard that might not be achievable in an era of the ubiquitous smartphone, even with smartphone survey applications. In fact, garnering response was more difficult for those not waiting after the crisis, requiring an alliance between the gas station and the investigator, which resulted in a comparable 100% response rate for the no-line condition.

Of course, the upside of smartphone applications collecting data is wider reach, a limitation of this study. The four lines assessed were more suburban than urban and within easy walking distance from each other, possibly attracting similar consumers in attitude and patience. On average, the lines did not show high levels of anxiety or hostility. It would not be unexpected for line reactions to vary from metro areas to suburban areas as a result of different thresholds for changes in mood.

Indeed, research on how location affects mood in crisis lines would be worthwhile for understanding consumers and making policy decisions on communicating and managing emergency lines. Perhaps, urban lines or those on major thoroughfares like the New Jersey Turnpike would have shown stronger negative moods in drivers and higher levels of anxiety and hostility than the suburban-urban lines considered in this study. It is also not inconceivable that countries could vary in their tolerance for lines as a result of prior experience or custom.

Another interesting area of research would be the comparison of subject mood before and after they fulfill their goal from a wait in line. In this study, it was not possible to ascertain the mood of subjects who waited following their acquisition of gasoline. Even if it is not possible to conduct this research on those waiting in crisis lines as was done in this study, laboratory studies might make such research feasible. Are hostility and anxiety reduced by fulfillment, or does negative mood linger? Might the wait, if managed well, foster flattering perceptions of a seller and more positive feelings?

CONCLUSIONS

This study showed that anxiety, hostility, and positive affect are increased by waiting in crisis lines, and position in such lines, as measured by distance from the goal, moderates hostility and positive affect. It also suggests that a reduction in uncertainty could reduce declines in positive affect for consumers and make an unpleasant situation more tolerable. In addition, the results support prior research that suggests restriction in need fulfillment increases negative mood but can also increase positive affect beyond what would be experienced without restriction. The findings also align with research in marketing and finance and decision affect theory that suggests uncertainty regarding goal fulfillment is a key factor in the emotional reaction of consumers to satisfying a need.

Though the data for this paper was collected some time ago, it remains a rare study of waiting in line for a necessity during a crisis. In fact, rarer than expected at the time by the lead investigator who moved to a different publication agenda and only recently uncovered the raw data in the
proverbial "old trunk," deciding to reanalyze the data and change the focus and literature review from its first presentation (Baugher et al., 1981).

The study suggests lines arising from any crisis in which access to a necessity is restricted, whether due to such untoward events as the coronavirus or an oil embargo, will impact the mood of those waiting in line in a similar way. Hostility, anxiety, and positive mood will likely increase with hostility increasing and positive affect decreasing as a function of "distance" from the goal. That said, no one wants to wait in line to improve their mood, though it’s useful to know a "more positive" feeling is possible. Feeling nothing and not waiting in line is likely the better scenario for most.

While crises come and go, it is important to emphasize that the reduction of uncertainty in crisis lines with location-based information, whether via smartphones or otherwise, should bring about improved moods for those who wait. Though far from perfect, the even-odd system tied to license plates during the 1979 gasoline crisis was a first attempt at reducing uncertainty. Fortunately, that crisis ended relatively quickly after a few months, requiring no additional approaches for uncertainty reduction. Indeed, the notion that mood can be improved through uncertainty reduction is not new. Restaurants often try to reduce uncertainty recognizing its importance for both customer satisfaction and mood, but its practice during a crisis is not especially common, probably for a simple reason: crisis is not routine.

REFERENCES


Dan Baugher, Ph.D. is Professor of Management and Program Chair for graduate management at Pace University. Prior to this role, he served as Associate Dean for Graduate Programs for 10 years and Chair of the Management and Management Science Department for 15 years in addition to serving as University Research Design and Statistical Consultant to the faculty. His recent research has focused on the validity of prior experience as a predictor of job performance and the impact of Netflix movie ratings on selling time for DVDs. He received Pace University’s top teaching honor, the University Kenan Award for Teaching Excellence, at its 2011 commencement, the Lubin School of Business Innovation in Teaching Award in 1998, Best Journal Article Award from the Decision Sciences Institute in 2003, and Best Case Award from The CASE Association and Eastern Academy of Management in 2010.

Chris Ramos, MPA, is Clinical Associate Professor and Executive Director of the Arts and Entertainment Management Program at Pace University. His research has focused on the impact of recession on staffing and funding for arts education in New York City schools and the cross-platform consistency of online ratings of movie quality. Professor Ramos joined the Lubin School of Business in 2012 and serves as the faculty advisor for The Industry Network student-run organization. He teaches a variety of courses in management including arts and entertainment management, nonprofit management, film/dance studies, managing creativity, business honors in management, and management and organizational behavior. He received the Lubin School of Business Excellence in Teaching Award in 2017 and Pace University’s top teaching honor, the University Kenan Award for Teaching Excellence, at its 2021 commencement.