Why am I waiting? The effects of information on aggression

**Abstract**

Waiting is an inevitable part of service organizations, yet waiting can fuel aggression of people waiting toward service employees. In this research we aim to explore the effect of providing information to people waiting, on their sense of procedural justice and on aggressive reactions to waiting in a queue. Using field intervention in a hospital Emergency Department, we show that information can improve procedural justice and reduce aggression, but that this effect is reversed as waiting is prolonged. We demonstrate a relationship between the waiting duration and aggression, and show that information strengthens this effect: For people waiting who receive information, the relationship between waiting duration and aggression is stronger than for people who do not receive information. We show these effects in two separate data collections, conducted one year apart, demonstrating the enduring nature of our theory. Our findings highlight the complex relationship between information and aggression, showing that information can reduce aggression but can also enhance it, in long waits.

Keywords:aggression; health care management; queues; information; waiting.

“Knowledge is power. Information is liberating.”

- Kofi Annan

Why am I Waiting? The Effects of Information on Aggression

Queueing to obtain a desired service is an inevitable part of modern societies [1]. However, it is unpleasant and may fuel aggression of people waiting, because it embodies the frustration of delaying gratification [2, 3]. Workplace aggression, typically between employees, elicits feelings of anger and frustration [4], and thus reduces well-being [5]. However, most service employees spend more time with customers than with other employees [6]‏, thus they encounter customer aggression frequently [7]. Hence, examining means of reducing aggression of customers against employees is important. When referring to customers we relate to all people waiting to receive service (such as customers, clients, patients).

Limited research has examined aggression of customers against employees [8], or means of buffering aggression [9]. In the current study, we aim to identify factors that provoke or attenuate aggression of people waiting, by joining other scholars [cf. 10, 11] who suggest that the availability of information can influence people’s reactions to waiting. We build on organizational justice theory [12], which suggests that informing people about organizational procedures can increase their sense of justice regarding a frustrating and unpleasant situation, such as queueing [13, 14, 15]. However, unlike these classic works, we show that in the case of customers waiting in a queue for a very long time, providing information has a complex influence that leads to a reverse effect, and may backfire, by increasing – rather than decreasing – aggression.

Information about waiting is unique in that it refers to events that are yet to occur (i.e., the information about how long one will have to wait is given before one actually receives service). However, most available studies examine how behavior is affected by information about events that *have already* occurred. Some examples are studies examining how information about the results of a clinical trial affects judgment [16](Biswas, & Pechmann, 2012); how information about past adverse organizational procedures affects trustworthiness [17]; or how information about past market performance affects financial decisions [18].

In contrast to such 'post-hoc' information, information about events that *are yet* to occur is inherently uncertain and its accuracy to the subject is unclear at the time of its delivery [19]: at the time of its delivery, there is no certainty about how accurate the information is. Moreover, providing information about future events can be considered a form of priming [20] or framing [21], and it instills a mindset of expectations regarding the event that is yet to occur. We propose that information about waiting is such an example of information about future events, a unique characteristic that complicates its effects on people’s behavior.

The differences between information about events that have occurred and information about events that are yet to occur can help make sense of mixed findings in previous research regarding the positive versus negative effects of providing people with information about organizational procedures. On the one hand, information about events that have occurred enhanced people’s understanding of the reasons for a wait, and thereby improved their sense of justice about a given situation [22, 23]. For example, information about an unsatisfactory situation that has already occurred elevated satisfaction [24] and perceptions of procedural justice [25]. Similarly, in a study of the food industry, customers who received visual information (viewed operating processes while waiting to be served) perceived greater employee effort, showed higher value of service, and more appreciation of the employees [26]. Also, providing people waiting with information about why they are waiting (in the form of representation of the physical and mental work being conducted while waiting) created the “labor illusion”, which resulted in enhanced perceptions of service provider effort, higher value of the service, and a feeling of reciprocity- that customers are waiting in return for service providers that are working, thus the wait is in exchange for the effort invested [27](Buell & Norton, 2011).

In contrast, information about future organizational procedures can evoke negative reactions, because it sensitizes people to what is will happen to them and others [28], making people more aware of the situation about which they receive the information [29], such as the waiting situations. Moreover, it might signal that the organization is at fault [11] and therefore lead to negative reactions. Thus, information about waiting, may make people are more aware of the fact that they are waiting, and more sensitive to the undesirable aspects of waiting, and to the details of the wait. In this vein, Mandelbaum and Zeltyn [30] show that customers waiting in queueing systems were more likely to hang up immediately after hearing recorded information about the future wait (e.g.:” you have two more minutes to wait”). Information may create a ‘primed mindset’ regarding the anticipated outcome of the wait – which, if eventually found to be inconsistent with the actual outcome, is likely to evoke negative reactions [31, 32]. For example, a wait of half-an-hour minutes will be much more annoying and disappointing for a person who was given information that the wait will be twenty minutes than for a person who did not receive any information regarding the expected waiting time. However, Colquitt and Chertkoff [33] show that information about future events may or may not affect the sense of procedural justice [33], and, where such effects do exist, they may be either positive or negative [34].

Taken together, it seems that explanatory information on past events leads to more positive outcomes, while information about future events leads to mixed findings. Hence, this study aims to reveal the boundary between when information about future waiting events leads to more positive or negative outcomes. Below, we attempt to explain this discrepancy; we begin with a literature review that leads to our hypotheses, and then report a field experiment in a hospital Emergency Department (ED) in which we tested how information about the wait moderated the negative influence of waiting duration on aggression.

Our study thus makes three main contributions to existing literature. First, it documents the effects of pre-emptive information about a waiting situation, namely, information provided before people endure an aversive situation. Second, it resolves the seeming contradiction between positive and negative outcomes of providing information, thus establishing the boundaries for the effectiveness of providing information about waiting. Third, it demonstrates the risks of providing information that can generate expectations, which may not be met; our findings show that in such situations, information can increase – rather than decrease – frustration and aggression.

**Theoretical Background and Hypotheses**

**Waiting Duration and Aggression**

Waiting is frustrating because it obstructs goal attainment [35, 36, 37] and, therefore, requires continuous self-control and regulation of emotions – abilities that are depleted over time [38]. Such depletion creates a risk of aggression [39, 40], suggesting that waiting is likely to lead to aggression. We build onprevious research [41, 42, 43] in defining aggression as acts carried out with the intention of causing harm to an individual or an organization. We focus on moderate forms of aggression—yelling, cursing, insulting, intentionally ignoring, causing minor damage to equipment, or interfering with work processes [44]—which are likely to emerge in response to negative waiting experiences. These hostile actions, variously referred to as uncivil [45], deviant [46], or retaliatory behaviors [47], are alarmingly common [48] and are likely to be predicted by situational triggers [49]. More extreme acts of aggression rarely occur in response to specific causes, such as waiting [50], and are, therefore, not included in our analyses.

To understand the effects of waiting in a queue on behavior, we suggest viewing it as a source of stress, and, specifically, as a hindrance stressor. Such stressors are defined as “demands that are perceived as hindering progress toward personal accomplishments or goal attainment” [51, 52]. Job stressors are known to elicit frustration and aggression [53]. Thus, we suggest that waiting in a queue is also likely to elicit aggression. The basic dynamic that drives the effects of waiting in queues is time, such that the time lost or wasted by people who must wait in a queue is the hindrance stressor. Accordingly, our first hypothesis is as follows:

Hypothesis 1: Waiting duration predicts people’s aggression while waiting.

**Waiting Duration and Procedural Justice**

Waiting duration is an objective aspect of waiting; a more subjective – yet key – aspect of waiting is the sense of procedural justice regarding the wait. Queues that follow a First-Come-First-Served (FCFS) discipline are perceived as fair [54, 55], while violations of the FCFS principle violate procedural justice and create a sense of unfairness [10, 36]. Several forms of justice can play out in waiting [e.g., distributive justice and interactional justice;56]. We suggest that most relevant to the study of waiting is procedural justice, as it refers to the decision rules by which resources are allocated [57, 58]. The policy that determines the next person to receive service determines the procedural justice of the queue.

Waiting makes salient the process of prioritization, which is inherent to queues. When service is not based on the FCFS discipline, certain people are served before others in a typically non-transparent process. The context of our present research is hospital medical services, in which violations of the straightforward FCFS discipline are frequent due to emergencies or critical medical conditions that require preferential treatment, and as available resources often limit the extent to which FCFS can be followed. However, the people who wait in the queue are typically unaware of these constraints and, in their view, any violation of the ‘default’ FCFS order is likely to appear unjust. Indeed, people generally tend to focus on their own needs rather than on the needs of others [59], so any preferential treatment given to others is likely to be construed as hampering their own procedural justice. These effects are cumulative; in longer waiting durations, more opportunities accrue for the people waiting to identify or label violations of procedural justice in the queue. Thus, our second hypothesis connects the waiting duration to the perceptions of the procedural justice of the queue:

Hypothesis 2: Waiting duration is negatively correlated with procedural justice during the wait, such that the longer the waiting duration the less the queue is perceived as procedurally just.

**Procedural Justice and Aggression**

Procedural justice is the type of justice most strongly related to counterproductive work behaviors [56]. Similarly, perceived procedural injustice evokes negative reactions, which can result in aggression [e.g., 13,14, 44, 60]. Meta-analyses of studies on justice [12] and on deviant behavior and aggression [61] report moderate to strong negative correlations between the perception of justice and aggression. In the broader context of social exchange theory [62, 63], aggression can be viewed as a form of repayment for perceived injustice [61, 64]. Of the different types of perceived justice, procedural justice is the best predictor of aggression, more than distributive and interactional justice [63]. Hence our third hypothesis:

Hypothesis 3: Perceived procedural justice is negatively related to aggression.

Hypotheses 1–3 connect the waiting duration and the perceived procedural justice of a queue to ensuing aggression. H1 suggests that aggression may arise directly, as a response to the inherent stress of queueing, while H2 and H3 suggest an indirect effect of waiting duration on aggression, through the accrued perceived procedural injustice of the queue. Our fourth hypothesis makes this mediated relationship explicit:

Hypothesis 4: Perceived procedural justice mediates the relationship between waiting duration and aggression.

**The Complex Effects of Explanatory Information on Aggression**

A final and central part of our theory regards the effects of information on the relationship between waiting duration and aggression. We build on Lind and Van den Bos [15] to suggest that procedural justice is most critical at times of uncertainty, such as waiting that represents a state of uncertainty [65]. Since information can enhance procedural justice, and prolong tolerable waiting [65], we could expect that that information will dampen the effects of waiting duration on aggression [cf. 66]. Thus, providing people with information that explicates the policies and the parameters that influence the wait can reduce uncertainty and frustration and, thereby, ease the waiting [11]. However, as noted above, it is also possible that providing procedural information about the wait will draw people’s attention to the object of the information – namely, the wait [29]. According to this logic, information that explicates the policies and the parameters that influence the wait can increase the saliency of the uncertainty and lack of control associated with the wait. In addition, as mentioned above, information can raise expectations about the likely duration of the wait [e.g., 67, 68]. Violations of these expectations – which is a likely scenario in situations that involve long waiting durations – can be frustrating and increase aggression.

Our next two hypotheses refer to these complex effects of information on the relationship between waiting duration and aggression. We propose that information about the wait can potentially reduce aggression when people wait for a relatively short period (thus, when the waiting expectation set by the information is most likely met). Conversely, when waiting is prolonged we expect that information about the wait will remind people of the fact that they are waiting, induce expectations that might not be met, and, ultimately, increase aggression. Hence, we raise the following hypotheses:

Hypothesis 5: Explanatory information regarding the wait moderates the direct influence of waiting duration on aggression, such that providing such information strengthens the positive relationship between waiting duration and aggression.

Hypothesis 6:Explanatory information regarding the waiting duration moderates the indirect influence of waiting duration on aggression via procedural justice, such that providing such information leads to a stronger positive relationship between the waiting duration and aggression.

Fig 1 summarizes our research model and hypotheses.

**Fig 1.** **Research model and hypotheses.**

We tested our hypotheses in a field stimulation study of people waiting in a queue in the ED of a large public hospital, a setting that frequently involves extended waiting durations. In Study 1, we tested our predictions by comparing people's aggressive reactions in two conditions: while information about wait durations was provided, or not provided. We also measured perceived procedural justice of the queue, as a mediating mechanism. Due to the results of this study, the distribution of information to people waiting became part of the hospital routine. Then, a year later, we again collected data from the same hospital (Study 2), which indicated that the findings of Study 1 continue to manifest. Thus, our findings show the enduring nature of the described effects.

**Study 1**

We conducted a between-subjects field experiment [69]‏, following the guidelines of [70] on the implementation of interventions in health contexts. In a randomized controlled study design, we presented information about hospital procedures to people in the waiting area (queue) of the ED in a large public hospital. We collected survey responses from these people to assess their perceptions of procedural justice and their degree of aggression. As a control condition for comparison, data were collected similarly prior to and again following the experimental intervention.

**Methods**

**Participants and Procedure**

We collected data in three phases: (1) Pre-test (week 1, n = 98 participants), in which no information was provided; (2) Information condition (weeks 2 & 3, n = 155 participants), which included providing information through large signs and pamphlets; and (3) Post-test (week 4, n = 75), in which no information was provided. The post-test condition was identical to the pre-test condition in all aspects to control for potential changes, which may have occurred unrelated to the information condition. Participants were people waiting in the queue of the hospital's ED (n = 328; *M*age = 36.48 years, *SD*age= 16.02 years; 52.1% males; 49% patients, 42% escorts, 7% undefined). They were approached and agreed to respond to a short survey in return for a free beverage from the coffee shop of the hospital. Research assistants visited the ED on random days and hours to collect the survey data. Ninety-six percent of the people approached agreed to respond to the survey. Study received hospital ethics committee approval.

**Presented Information**

 We decided what information to present based on preliminary observations in the ED, interviews with ED staff, and a sample of patients and escorts. The chosen information, which was not previously available to people waiting in the queue, was presented in the format of a flow chart describing the various stages that a typical visitor to the ED encounters, including expected waiting durations for the various stages of the visit (e.g., two hours for blood test results; five hours for the total average stay in the non-ambulatory ED ward, etc.; supporting information S1 Appendix). The durations of the various stages of the visit were calculated based on the interviews with the ED staff and hospital archival data regarding average waiting duration for each stage. In the information condition, the information was shown simultaneously on large signs in the ED waiting area and in pamphlets that people received from the receptionist when they arrived at the ED.

**Measures**

**Manipulation check**

To verify that the information had been appropriately communicated, we asked participants to respond to items that assessed informational justice (namely, the appropriateness, honesty, and adequacy of the provided information; based on Colquitt [71]) and items that more specifically assess information clarity:

**Informational justice**

This parameter was measured by using a three-item Likert scale (adapted from Li et al. [72]): “The information I received was given in: a candid and direct fashion; in an honest fashion; in an explicit fashion” (Cronbach's α = 0.93). We used a 1–7 scale, with 1 = "I agree to a very small extent" and 7 = "I agree to a very high extent".

**Informational clarity**

This parameter was measured by using a four-item Likert scale (based on Brockner et al. [73]): “The information in the poster and pamphlet is generally clear and understandable"; “The information about the functioning of the ED is clear”; “The information about the ten things that I need to know in the ED is clear”; “The hospital map is clear” (Cronbach's α = 0.85). These items were presented only to people in the information condition. We used a 1–7 scale, with 1 = "I agree to a very small extent" and 7 = "I agree to a very high extent.

**Waiting duration**

This parameter was measured as the amount of time between the participant's arrival at the ED and the time in which he/she responded to the survey. It was based on two questions: “When did you arrive at the ED?” (arrival time) and “What time is it now?” (current time). The duration of the wait was calculated as the difference between the arrival time and current time.

**Procedural justice**

This parameter was measured by using a seven-item Likert scale [adapted from 72, 74]: “The ED functions in a proper manner”; “There is order in the way the ED functions”; “I understand the order in which people are served”; “I understand why I am waiting”; “The order in which people are served is determined justly”; “The order in which people are served is determined fairly”; “The duration of the wait in the ED is determined in a just manner” (Cronbach's α = 0.92). We used a 1–7 scale, with 1 = "I agree to a very small extent" and 7 = "I agree to a very high extent.

**Aggression**

This parameter was measured by using a scale of moderate aggressive acts typical to the ED setting. The scale was adapted from Glomb [63] to the ED context, following recommendations to adapt self-reported measures to the specific context [75]. We started with a list of 44 aggressive acts, based on observations at the ED, interviews with ED staff, and a literature review. In a pilot study, undergraduate students (n = 43; *M*age = 25.23 years; 63% female) rated the level of aggressiveness, relevance to the hospital setting, and clarity of the 44 items, using a 7-point Likert scale (1 = "to a very small extent"). The ratings of the full set of items yielded *M*aggressiveness = 4.84 (*SD* = 1.45); *M*relevance = 4.39 (*SD* = 0.88); and *M*clarity = 6.49 (*SD* = 0.28). We then omitted items that were rated below the mean score for relevance and items rated below -1SD for clarity. Since we were interested only in acts of moderate aggression, only items rated between the mean and +1 SD for aggressiveness were included in the survey. The final measure included seven items: “I would like to use an aggressive tone of voice towards a staff member / yell into the air / enter the office without being called / curse / bang on a table / slam a door/interrupt a staff member” (Cronbach's α = 0.73).

**Control Variables**

Following Carlson and Wu [76], we controlled for variables for which there is theoretical basis to predict influence on the dependent variables, procedural justice and aggressive intentions:

**Number of medical interactions (NMI)**

The NMI was defined as the number of times a participant reported having been served by medical personnel and/or undergoing medical tests in the course of their current visit to the ED. This serves as a proxy for patient severity of medical condition and for familiarity with the ED procedures, which might affect wait duration expectations, procedural justice, and in turn, aggression.

**Time of day**

Time of dayis known to influence mood, negative and positive affectivity [77] and aggression [78]. Following Spector et al. [79], who call not to control for negative affectivity in research concerning job stressors (such as waiting), we controlled for time of day as a proxy for mood and affectivity.

**Demographic variables**

Participants were asked to indicate their gender, age, years of education, native language, religion, number of visits to the ED in the past three years, and role during the visit (patient/escort).

**Results**

**Manipulation Check**

Analysis of the measure of information clarity confirmed that the information presented during the information condition was clear (*M =* 6.18, *SD =* 0.83). An ANOVA showed that informational justice was significantly affected by the study condition (*F***(1,326)** *=* 7.76*, p* < 0.01), with significantly higher informational justice in the information condition (*M =* 4.55*, SD =* 2.13) than in the pre-test (*M =* 3.51*, SD =* 1.96*, p <* 0.01) and post-test (*M =* 3.32*, SD =* 2.20*, p <* 0.01) conditions. There was no difference in informational justice between the pre- and post-test conditions (*p =* 0.54), confirming that the manipulation was successful in providing information that was otherwise unavailable to the participants. As there were no significant differences between the pre-test and post-test conditions (n.s) in any of the study variables (waiting duration, procedural justice, aggression), these conditions were combined and we refer to them throughout our analyses as the ‘no-information condition’.

**Waiting Duration, Justice Perceptions, and Aggression**

Table 1 summarizes the means, standard deviations, and inter-correlations between all study variables. Hypotheses 1–3 were tested by using a regression analysis of the full dataset, including the three study conditions, and controlling for the effects of time of day and number of medical interactions. The analyses confirmed a positive relationship between waiting duration and aggression (*β* = 0.22, *p* < 0.001), supporting Hypothesis 1, a negative relationship between waiting duration on procedural justice (*β* = -0.29, *p* < 0.001), supporting Hypothesis 2, and a negative relationship between procedural justice and aggression (*β* = -0.14, *p* < 0.05), supporting Hypothesis 3. There was no influence of the time of day or of the number of medical interactions on either aggression or reported procedural justice (n.s).

**Table 1. Means, standard deviations, and correlations among study variables.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Variable** | **Mean** | **SD** | **1** | **2** | **3** | **4** |
| 1. **Waiting durationa**
 | 2.88 | 2.2 | - |  |  |  |
| 1. **Procedural justice**
 | 3.69 | 1.84 | -0.10\* | - |  |  |
| 1. **Aggression**
 | 1.89 | 1.86 | 0.14\*\* | -0.14\*\* | - |  |
| 1. **NMIb**
 | 2.62 | 2.24 | 0.53\*\* | 0.20\* | 0.01 | - |
| 1. **Time of dayc**
 | 3.68 | 1.27 | 0.22\*\* | -0.02 | -0.04 | 0.24\*\* |

|  |
| --- |
| \* Correlation is significant at the 0.05 level (1-tailed). |
| \*\* Correlation is significant at the 0.01 level (1-tailed).a Measured in hours.b Number of medical interactions during the visitc Measured in hours, such that 3.68 stands for 3:42 pm. |

The mediating role of procedural justice in the relationship between waiting duration and aggression was tested by using Hayes’s [80] model 4, bootstrapped sample = 5000. As predicted, waiting duration had a negative influence on procedural justice (*β* = -0.24, *p* < 0.001, CI = [-0.35, -0.14]) and a positive influence on aggression (*β* = 0.15, *p* < 0.01, CI = [0.04, 0.26]). The indirect effect of waiting duration on aggression via procedural justice was significant (*indirect effect =* 0.04*, CI =* [0.01, 0.08]; *R2 =* 0.10*, p <* 0.001, boot=5000). Results support Hypothesis 4 (see Table 2).

**Table 2. Simple mediation predicting aggression (Hayes [80], model 4)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Procedural justice****β(SE)** | **Aggression****β(SE)****Direct effect** | **Aggression****Indirect effect**Estimate 95% CI |
| Constant | 4.63\*\*\*(0.33) | 2.34\*\*\*(0.44) |  |
| Waiting duration | -0.24\*\*\*(0.05) | 0.15\*\*(0.06) | 0.04 [0.01, 0.08] |
| NMI | 0.29\*\*\*(0.05) | -0.033(0.06) |  |
| Time of day | -0.06(0.08) | -0.01(0.22) |  |
| Procedural justice |  | -0.14\*(0.06) |  |
| R2 | 0.1\*\*\* | 0.05\*\* |  |

\**p* < 0.05, \*\* *p* < 0.01, \*\*\* *p* < 0.001

**The Moderating Influence of Information**

The presented information moderated the direct effect of waiting duration on aggression (*β* *interaction =* 0.20*, p <* 0.05*, CI =* [0.02, 0.39]),supporting Hypothesis 5. Next, Hypothesis 6 was tested with Hayes’s [80] model 5, bootstrapped sample = 5000. As predicted, providing information moderated the direct effect of waiting duration on aggression (*β interaction =* 0.20*, p <* 0.05*, CI =* [0.02, 0.39]). As predicted, the waiting duration increased aggression in the information condition (*slope =* 0.26*, p <* 0.001*, CI =* [0.11, 0.41]), but not in the no-information condition (*slope =* 0.06*, p =* 0.42). The slope in the information condition differed significantly from that of the no-information condition (*p* < 0.01). In addition, procedural justice mediated the indirect effect of waiting duration on aggression (*β* = 0.03, CI = [0.01, 0.07]; *R2* = 0.10, *p* < 0.0001). Thus, providing information to people waiting in the queue was associated with a significantly stronger relationship between the waiting duration and aggression (Table 3, Fig 3), supporting Hypothesis 6.

**Fig 3.Summary of the results of research model.**

**Table 3. Moderated mediation predicting aggression (Hayes [80], model 5)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Procedural justice****β(SE)** | **Aggression****β(SE)****direct effect** | **Aggression****indirect effect**estimate 95% CI | **Aggression**conditional direct effect**estimate 95% CI** |
| Constant | 4.63\*\*\*(0.33) | 2.60\*\*\*(0.45) |  |  |
| Waiting duration | -0.24\*\*\*(0.05) | 0.06(0.07) |  |  |
| NMI | 0.29\*\*\*(0.05) | -0.05(0.06) |  |  |
| Time of Day | -0.06(0.08) | -0.08(0.08) |  |  |
| Procedural Justice |  | -0.14\*(0.06) | 0.03 [0.01, 0.07] |  |
| Information |  | -0.08\*(0.35) |  |  |
| Waiting duration × Information |  | 0.02\*(0.09) |  |  |
| R2 | 0.1\*\*\* | 0.07\*\*\* |  |  |
| Information provided |  |  |  | 0.06(0.07)[-0.09, 0.02] |
| Information not provided |  |  |  | 0.26\*\*\*(0.07)[0.11, 0.41] |

\**p* < 0.05, \*\* *p* < 0.01, \*\*\* *p* < 0.001

**Discussion**

The results of Study 1 fully support our hypothesis that the longer people wait to be served, the less just they perceive the organizational procedures and – at least partly in consequence – the more aggressive they tend to be. In addition, providing explanatory information about the wait modifies the influence of waiting duration on aggression, such that the information strengthens the influence of waiting duration on aggression. Taken together, these findings indicate that longer waits can stimulate aggression – both directly, because the wait acts as a hindrance stressor, and indirectly, by reducing the perceived procedural justice, and that explanatory information about the wait is useful in reducing aggression only for relatively short waiting durations. Thus, the longer the wait, the more likely that explanatory information will ‘backfire’ and enhance aggression. We explain this reverse effect of providing information by suggesting that the information increases the saliency of the waiting situation, which, in turn, primes feelings of procedural injustice. Thus, whereas people waiting who are not provided with information about their wait may be more patient in waiting for their turn, providing such information may increase aggression.

 How long does the effect of providing explanatory information last? One possible interpretation of our findings is that they may represent a classic “Hawthorne effect” [81], in which an organizational intervention may affect—in itself and independent of the nature of the intervention—organizational outcomes. Clark and Sugrue [82] noted that uncontrolled novelty effects cause, on average, 30% of a standard deviation (SD) rise, which decays to a low level after eight weeks.

The ED utilized the results of Study 1 and continued to present this information, independently from the experiment, during the year that followed Study 1. Following Hagger and Luszczynska [70], we conducted a long-term follow-up measure of the interventions’ effects, by reassessing the effects of providing information on aggression of people waiting, one year after concluding Study 1.

**Study 2**

Data were collected one year after Study 1 was concluded in the same ED of the same large hospital. At the time of conducting Study 2, the information provided in Study 1 was still available for the people waiting in the queue. In Study 2, a research assistant replicated the data collection processes reported in Study 1, using the same surveys.

**Methods**

Data were collected over 30 days from 99 patients (36.3%) and escorts (63.7%) waiting to be serviced in the ED (*M*age = 37.18 years, *SD* = 16.63 years; 49.5% males). Only one research condition – identical to the information condition that was used in Study 1 – was studied. All measures were identical to those used in Study 1. Study received hospital ethics committee approval.

**Results**

##### Waiting Duration, Justice Perceptions, and Aggression

The regression analyses confirmed a marginally significant positive influence of waiting duration on aggression (*β* = 0.55, *p* = 0.09), partially supporting Hypothesis 1. However, this effect was stronger than that found in Study 1 (*β* = 0.22), and the effect size was substantial (*ɳ*2 = 0.65), indicating that the marginal significance is due to the smaller sample size (n = 155 in the information condition in Study 1, versus n = 99 in Study 2). A *t*-test comparing the beta values in the two studies showed that the beta value in Study 2 was significantly higher than that in Study 1 (*t-difference(421) =* 7.24*; p <* 0.01).

As in Study 1, the waiting duration was negatively related to the perception of procedural justice (*β =* -0.09*, p <* 0.05), supporting Hypothesis 2, and a negative relationship between procedural justice and aggression (*β* = -0.42, *p* < 0.01), supporting Hypothesis 3. The mediating role of procedural justice in the relationship between waiting duration and aggression was tested according to Hayes’s [80] model 4, bootstrapped sample = 5000. As in Study 1, the waiting duration had a negative effect on procedural justice (*β =* -0.2*, p <* 0.01*, CI =* [-0.30, -0.10]). The indirect effect of waiting duration on aggression via procedural justice was significant (*β indirect effect =* 0.05*, CI* = [0.01, 0.10]; *R2 =* 0.13*, p <* 0.01, boot=5000), thus results fully support Hypothesis 4.

Since Study 2 had only one condition (with information), Hypotheses 5 and 6 could not be reexamined. Therefore, to evaluate the long-term effects of providing information, we used a t-test to compare the level of aggression Study 2 with the results obtained in the information condition of Study 1. No significant differences were found between the level of aggression in the information condition of Study 1 (*n = 155, M =* 1.81*, SD =* 1.90) and the level of aggression in Study 2 (*n = 99, M =* 1.84*, SD =* 1.3) (*t (252)=* 0.14*; p =* 0.89).

**Discussion**

Study 2 reaffirms the findings of Study 1 and confirms the long-lasting effect of providing information to people waiting in an ED. Study 2 confirms that information has a robust effect in elevating procedural justice even a year after the information had been first introduced, and long after the researchers have left the hospital.

**General Discussion**

In this research we attempt to fill the gaps in the literature regarding understanding the underlying mechanisms explaining aggression of customers against employees [8] and regarding testing means of buffering aggression [9]. Our findings are consistent with existing theories on aggression and procedural justice [10, 36, 37, 39-43] , and they extend these theories by providing boundaries to them. First, we resolve a contradiction between existing theories that regard the bright and dark sides of providing information; namely, we suggest the boundaries of the positive effect of providing explanatory information by showing that such information reduces aggression only in short waiting durations. This conclusion can be expanded to a broader context of short periods of perceived unfairness. Second, our findings show the downside of providing explanatory information about the wait. We demonstrate that providing information about the organizational procedures that underlie a queueing situation comes at a risk of increasing aggression. We explain these results by suggesting that the provided information focuses attention on the content and issues that it highlights, thus making the unfair situation of the wait more salient and primes a mindset of what constitutes a ‘fair procedure’. When the personal experience of the individual does not match this mindset, people react negatively [31] and tend to be more aggressive. In other words, the information generates expectations, which may not always be met, and, in turn, can lead to higher levels of aggression, as compared with situations in which no information is provided. Our findings show that this ‘dark side of information’ is stronger when the wait (i.e., the period of unfairness) is prolonged. Third, we add to existing research on the effects of providing post-hoc information [25] by elucidating the effects of information on the reactions of people to future or current events.

**Limitations and Future Directions**

Our focus on the ED waiting rooms offers insight into a widespread problem of recurring aggression against healthcare professionals, but it also limits the generalizability of our findings to this highly stressful, potentially life-threatening context [83]. Research suggests that the severity of the situation or outcome being explained can influence the effectiveness of the provided information [12, 33]. Therefore, additional research is essential for testing our hypotheses in less-extreme situations (e.g., queues in call centers or banks). In addition, our study focused on information about organizational procedures, and particularly about wait durations. Future research should examine whether other types of information have a different influence on people’s sense of procedural justice or aggression. Finally, we show that providing information effects aggression. We theorize that the information sets expectation and that the waiting duration can potentially violate these expectations, and, as such, information distributed during long waiting durations may backfire. However, to empirically examine this underlying mechanism, future studies should also include a measure of expectations (or expectation violations).

**Conclusions**

Theoretically, this research a contradiction between theories that predict that explanatory information should reduce or enhance negative outcomes such as aggression. We show that providing information can strengthen the influence of waiting duration on aggression and may effectively reduce aggression – but more so for shorter waiting durations than for longer waiting durations. As such, our findings identify boundaries for the effectiveness of providing explanatory information in reducing the aggression of people waiting in a queue, showing that the beneficial effect of providing information is more likely when the person queueing regards the expected waiting durations generated by the information as likely to be met. More broadly, we suggest that the positive effects of providing information has boundaries of the duration of the wait (i.e., the period of injustice) that people are willing to accept as reasonable. In practical terms, these findings suggest that management – at least in EDs – should analyze customer service situations to ensure that the provided information engenders realistic expectations. When information is effective, its positive effects are robust and continue long after the information is initially introduced.

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**Fig 2*.* Simple slopes illustrating the influence of waiting duration on aggression, with and without explanatory information.**

Supporting information

##### S1 Appendix. Information provided in the Emergency Department.

**The process of patient treatment in the Emergency Department**

**Non-ambulatory ward**

This ward accepts patients who cannot walk. It includes:

Unit A: Internal

Unit B: Trauma, surgical, orthopedics

Unit C: Waiting for hospital admission; intensive-care unit

**Ambulatory ward**

This ward accepts patients who can walk, with internal, surgical, orthopedic or gynecological issues

 ~170 patients treated daily. Average wait duration - 8 hours.



Evaluation and decision-making

**Frequent examinations in the ED:**

Initial nurse examination and disability anamnesis

Physician examination

Blood tests (~two hours for results)

Imaging tests: X-ray, CT, US (~two hours for results)

Consultation with hospital specialists

(waiting duration depends on specialist’s availability)

 ~130 patients treated daily. Average wait duration - 5 hours.

**Hospitalization**

Waiting durations vary according to the complexity of condition and available space in designated wards.

If designated wards are full, patients will be treated in the Emergency Department until transferred.

**Release**

You will receive a release letter.

Present release letter to the Emergency Department physician promptly for treatment and follow-up recommendations.

Return to reception desk for administrative release.

In subsequent visits, bring physician referral and financial obligation agreement.