Elevator Angst:

Effects of short distance stops on passenger anger

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Abstract

Elevators are a type of queued publicly owned entities. This Experiment tested for a change in negative responses by subjects when experimenters rode an elevator only a short distance versus a longer distance. Statistical analysis was used to determine a critical distance in responses occurring between third and fourth floor when tested in 12 and 14 floor buildings. Implications and other experiments related to queues in public areas are discussed.

Note: This paper was a project for an introductory psychology class and is not peer reviewed. I wouldn't think there is much (if any) data traceability in this paper.

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Elevator Angst: Passenger anger with others short riding elevators

This experiment attempts to study social norms in queued public owned areas. Elevators fit into this category and will be the focus of this experiment. Specifically, this experiment will test the responses of subjects to a confederate exiting the elevator on a lower, small distance traveled floor .

Prior experiments have shown the existence of public entity norms and a difference in behavior when these norms are exceeded by others. "..studies showed that drivers leaving a public parking space are territorial even when such behavior is contrary to their goal of leaving... Intruded-upon drivers took longer to leave than nonintruded-upon drivers" (Ruback, 1997). Elevators have a unique trait that they queue the order of exit from the shortest to the longest distance and not upon the relative need or upon a time of entry. Previous studies have provided evidence "..that the queue constitutes a social system... The rules and norms inherent in the queuing system.. define the rights and obligations of the individual..." (Schmitt, 1992). These rights and obligations form a social norm for the use and appropriateness of elevators. In a study of ownership, Beggan (1995) found that people consistently rate subject to have a larger claim to usage when an association exists between the object and the subject but not when the usage was considered "selfish or destructive". Riders using an elevator to travel between successive floors could be considered by others to be selfish and destructive. Breaking the norms creates outrage and frustration directed towards the violator or queueing system. The intensity of negative reaction often depends on which part of the queue the violator is present. "Subjects evaluated a.. service more negatively if a delay occurred at the beginning or at the end.. than when it occurred

during..." (Dubé, 1991).

This experiment tests if social norms are present in the riding of elevators and are punishable if broken. The hypothesis is that riding an elevator for a short distance and increasing the riding time for others is a socially restricted behavior and will be punished by negative responses. A result of this hypothesis is that negative responses will decrease with an increase in the change of floor level. The trials will attempt to vary a subject's negative responses by manipulating the level of an experimenter's exit floor.

It is predicted that riding an elevator for short distances is socially unacceptable and will cause an increase in negative responses. These negative responses are expected to range in strength, which will be characterized by 'no response', 'non-verbal response' and 'verbal response'. Subjects are expected to exhibit negative responses to exiting at lower floors because of the time spent at lower floors. Additionally, subjects are expected to associate the use of the elevator with higher floors so that lower floors are considered 'not worthy' of using the elevator. Negative responses are expected to be distributed along all of the floors. Lower floors will have a higher rate of negative responses. A non-linear decrease in negative responses is expected as higher floors are reached.

Method

Subjects

This experiment was conducted among males in Oklahoma State University operated dormitories. Subjects were students or visitors who did not know the experimenters. Subjects were randomly chosen and were not paid or aware of the ongoing experiment. A total of 105 subjects were studied. The average age is unknown but is expected to be near

20 years.

Materials and apparatus

Each of the four elevators in the dormitories are seven by seven feet and were manufactured by Otis Elevator Company. All have a minimum dwell time of 10 seconds per stop. On average, the elevators take 5 seconds to travel between successive floors. The control panels, which are mounted in the front left sides of the elevators, use press buttons to select individual floors.

Procedure

Two male experimenters, one stooge and one observer, were selected to be of average height, weight and build with no physical problems. The experiments were conducted in two university dormatories with approximately an equal number of elevators and floors. One has 12 floors and the other has 14. All elevators were working and no maintenance was being performed on stairs. The experiment was conducted on weekdays between eight in the morning and five in the afternoon on floors two, three, four and five. On the ground floor, the two experimenters waited for a lone male to enter an elevator, at which time both experimenters also entered the elevator. No social contact was made between either the experimenters or between the subject and experimenters. If the subject recognized either experimenter or engaged in conversation or any other abnormal behavior occurred, the experiment was halted. If the experiment was currently going properly, the stooge noticeably pressed the button for the floor to be tested regardless of the position of the subject relative to the elevator control panel. After the stooge exited on the appropriate floor, the observer recorded any negative responses exhibited by the subject towards the

stooge by coding a number to different types of negative responses.

0 = No response to the stooge exiting the elevator
1 = Non-verbal responses
2 = Verbal or physical response

To record all relevant comments by the subject, the observer remained on the elevator until after the subject exited.

Results

Raw data for the subjects' severity of reactions are given in Data 1. Overall distribution of similar responses were reasonably scattered among the trials suggesting that the responses can be considered independent of the trial number and time of trial. Nearly 45% of subjects for the second floor trial exhibited a negative response, severity '1' or '2'. By comparison, only one subject (4%) exhibited negative response of severity '1' or '2' with the fifth floor trial. Statistics for reactions versus floor are given in Table 1.

Table 1. Statistics of subjects' reactions as a function of stooge's exit floor

Floor	Mean	SD	Min	Max	N
2	.59	.75	0	2	27
3	.36	.64	0	2	25
4	.15	.46	0	2	27
5	.04	.20	0	1	26

One way analysis of variance (ANOVA) was performed between floors two and three. A p value of 0.235 was calculated, which suggests that the difference in subject responses between floor two and floor three is not statistically significant with 0.05 as the critical p, $p = 0.235 > 0.05$.

ANOVA between floors two and four was performed. The p value was calculated to be 0.011, suggesting that a significant statistical difference exists between the subject

responses of floor two and four, $p = 0.011 < 0.05$. No ANOVA was performed between floors two and five due to the even larger mean difference than between floors two and four.

Discussion

The results of the experiment indicate that there was a significant decrease in the severity of subject reactions when the exit floor was increased. The probability of a negative response at the second floor was 15 times larger than at the fifth floor. The predicted response and the data gathered support the hypothesis that riding an elevator for a short distance is a social unacceptable behavior. The hypothesis proposed that it is not acceptable to ride an elevator for short distances. The experiment's data analysis infers that the average distance considered short by the subjects is less than four floors; $p = .235$ for third floor but $p = .011$ for the forth floor. With almost half of the subjects responding negatively to the stooge's exit at floor two, the data agrees with the hypothesis that punishment will result from unacceptable behavior. " [a study] found that although only about 6% of the women said that aggression was an ideal reaction,.. over half of the participants in the study thought that even a socially justified goal interference could actually provoke aggression" (Berkowitz, 1989). Furthermore, the lack of negative responses at the fifth floor also agrees with the prediction of the hypothesis that negative responses will decrease rapidly. The time spent at lower floors contributes more towards negative responses than that spent at higher floors. "These barriers [delays] are sources of frustration and other negative affective reactions. Barriers are perceived as less aversive, however, if they occur inside rather than outside the goal region (Dubé, 1991). The hypothesis agrees with

the predictions.

Other findings are possible and could easily be constructed due to the small number of trials performed. No previous knowledge of the state of elevator usage in the tested buildings was known. Additionally, the subject's exit floor was not recorded so the negative responses may have been concentrated in subjects exiting high floors. No attempt at recording the previous activities of the subject could be recorded, so subjects arriving varied in mood and amount of stress.

This experiment compares favorably with previous studies of social norms in public areas. Other studies of ownership, priority and value of time can be applied to this experiment.

Social attitude studies have resulting in observing social norms about who is more entitled to a public service. "..this series of studies suggests that people will be territorial in task-specific public territories,.. and that distraction is not a sufficient explanation for the effect" (Ruback, 1989). Obviously, certain groups of people will consistently be viewed as worthy of using a service. "..one might expect that elderly and perhaps overweight individuals use the elevator more frequently for both shorter and longer trips..." (Wogalter, 1997).

Social norms exist for forming queues and who has priority. Unlike many other public queues, elevators order the riders depending upon the exit floor. Furthermore, the queue can be intruded easily by lower floor riders without first serving the high floor riders. "being unable to tell exactly where to line up, or to ascertain who preceded whom in terms of order of arrival, each considers himself entitled to priority. The incontestable rationality of this

individual assumption evolves often into the drama of *collective* irrationality..." (Schwartz, 1975). This research supports the hypothesis that when a low floor rider enters a social norm is broken by intruding upon the queue. "[subjects] are more likely to respond when they encounter the violation of a social norm related to the queue than when they are confronted with a situation that causes a comparable loss of time but does not threaten the implicit rules and norms of the queuing system... [subjects] were more likely to respond if the delay was caused by the intruder than by the service provider" (Schmitt, 1993).

In studies of energy use and conservation of elevators, most concluded with a statement of stubbornness of individuals to consider not using an elevator. "Clearly, elevator use involves less effort, provided the elevator and stairs are situated in close proximity to each other... It is reasonable to assume that if all other things are equal individuals should choose the response associated with the shortest delay of reinforcement" (Van Houten, 1981). This assumption was tested in Kohlenberg's (1976) study that found that posters and pleas did not decrease elevator use. Unfortunely, less effort on the individual's part results in a considerable increase of power consumption from elevator activity. In a study testing the effectiveness of signs to increase stair usage, Van Houten (1981) found that, "Large power savings would be achieved only if [a majority] choose not to use the elevator". Further studies into the social norms associated with elevators could be made. A study of differences in response for taller and shorter buildings would test if the critical floor is determined by the height of the building or by other factors. In this experiment, the maximum floor height was 14 stories of which the critical floor was approximately one fourth of the total height. Using the hypothesis, it would be expected that a more severe negative

response would be obtained in higher buildings due to the ever increasing time to reach the top floor. Future study could also test how appearance and attitudes of the experimenter changes the response of the subject. "There are a number of studies that indicate a close relationship between frustration and prejudice. Individuals get more aggressive when the target person is disliked for his social visibility" (Ahmed, 1982). Similar study could test if the presence of an authority made any difference in negative responses. In a study on redundant button pushing following the pressing of a button by an experimenter, Fryrear (1976) concluded that, "It was clear that an authority figure did inhibit the amount of button-pressing more than a peer." Testing responses of a subject versus the status of the experimenter would give additional insight into the cause of subject responses.

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Appendix

Data 1.

Raw Data for Subjects' reactions:
Floor versus trial

	second floor	third floor	fourth floor	fifth floor
1	0	1	0	0
2	1	0	0	0
3	1	0	0	0
4	0	0	0	0
5	2	2	0	0
6	0	0	0	0
7	0	1	1	0
8	1	0	0	0
9	0	0	0	0
10	2	1	0	0
11	0	0	0	0
12	1	0	2	0
13	1	0	0	0
14	0	1	0	1
15	0	0	0	0
16	0	0	0	0
17	0	2	0	0
18	2	0	0	0
19	0	0	1	0
20	0	1	0	0
21	1	0	0	0
22	0	0	0	0
23	1	0	0	0
24	0	0	0	0
25	1	0	0	0
26	2	.	0	0
27	0	.	0	.
28	.	.	.	.

0	no response
1	non-verbal response
2	verbal response