The role of personal experience in contributing to different patterns of response to rare terrorist attacks

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Abstract:

An examination of the behavioral effect of repeated terrorist attacks reveals that local residents (of the attacked area) appear to be much less sensitive to this risk than international tourists. Furthermore, the limited sensitivity on the part of local residents seems to diminish with time even when the attacks continues. An experimental study is presented that explores this pattern. This study shows a similar pattern in a laboratory experiment that focuses on a basic decision task: When making a single decision based on a description of the problem, people tend to be more risk averse. Personal experience with the problem reduces this sensitivity. These results highlight an interesting relationship between basic decision-making research and the study of the response to traumatic events.

Keywords: Decision making, experience, learning, terror, tourism, Al-Aqsa Intifada, underweighting of rare events.

The effect of terrorist activity on tourism represents one of the main economic effects of terrorist activities (Weimann and Winn, 1994). Understanding the factors that contribute to this effect is therefore important in an attempt to mitigate it. Empirical investigation of the effect of terrorist attacks on tourism demonstrates an interesting difference between international and domestic tourists. Whereas repeated (but rare) terrorist attacks have a dramatic effect on the behavior of international visitors to areas under terrorist attacks (Drakos and Kutan, 2003; Krakover, 2002; Sönmez , 1998; Sönmez and Graefe, 1998), the effect of these attacks on domestic tourists (i.e., local residents who travel within the country) does not seem to be very strong (IMT, 2000, 2001; ICBS, 2002; See also Oberholzer-Gee and Frey, 1995).

One set of contributing factors to this pattern involves economic considerations (see Becker & Rubinstein, 2004). The cost of avoiding a risky area is much higher for local residents than to potential visitors. For an example consider the situation in Israel (since 2000 to the current date) in which local cafés are a target of terrorist attack. To avoid Israeli cafés local residents have to give up sitting in cafés or to travel abroad. Potential tourists, on the other hand, can simply select a different destination on their next vacation.

A second set of contributing factors involves cultural and/or ideological differences (see Hurley, 1988; Tremblay, 1989). Different cultures are characterized by different value systems (Hofstede, 1991) that can lead to dissimilar response patterns. For example, in some cultures, solidarity is important whereas personal risk is underweighted (see e.g., Figueredo et al., 2001). For instance, in an interview the owner of a restaurant in Haifa, Israel that has been destroyed by a terrorist attack, killing 16 customers and workers, said that when he reopened the restaurants many people came to dine in order to support him (Ali Adawi, personal communication).

There may also be more transient differences between cultures. For example, Tremblay (1989) noted that visitors from some countries are better informed about political events in their destination country. In this respect, locals are more likely to be better informed than international tourists.

The main goal of the present paper is to highlight the importance of a third set of factors. Specifically, we focus on the hypothesis that at least part of the observed difference in behavior between domestic and international visitors is a result of the sensitivity to recent personal experience (see Barron and Erev, 2003). Under this "personal experience" hypothesis, local residents who are exposed to risk without suffering bad outcomes are likely to base future decisions on this (positive) experience. As a result, the typical experience of locals (i.e., going out without being harmed) reduces the effect of terrorist attacks.

The present paper is organized as follows. Section 1 summarizes the empirical evidence concerning the effect of terrorist attacks on international and domestic tourists. Section 2 presents an experimental study suggesting that a "personal experience" effect can contribute to this difference. The paper concludes with a discussion of the policy implications of the present results.

1. The effect of terrorist attacks on local residents and international tourists

The empirical research presented here focuses on the wave of terrorist attacks in Israel, known as the Al-Aqsa Intifada. This wave has three properties that make it a convenient problem for empirical study. First, the Intifada had a well-defined beginning (September 2000, marked by Ariel Sharon's visit to the Temple Mount and the first surge of terrorism in the city of Hadera). Secondly, terrorism within the State of Israel (not including the West Bank and Gaza Strip) was targeted towards specific

civilian targets, including hotels, restaurants, café's, and clubhouses. Thirdly, the terrorist activity was continuous. Between the months of September 2000 and October 2003 there were terrorist activities on each month that led to fatalities (for a complete list see ICT, 2004). This can therefore be described as a period in which there was a small probability of being a victim of terrorism as a result of taking part in several relatively well-defined leisure activities.

To evaluate the effect of the Intifada on tourism, the Israeli Central Bureau of Statistics (2002) calculated the number of bed nights in Israeli hotels by population type (inbound or domestic tourists) prior to and following the outbreak of the Intifada. "Bed nights" denotes the number of beds occupied overnight by accommodation establishments (WTO, 1993). The examination included hotels that were either certified by the Ministry of Tourism as Tourist Hotels or have issued a petition for certification. Overnight stays in these hotels comprise over 80% of the total overnight stays in Israeli hotels. The results (See Figure 1) show an initial drop in overnight stays by both inbound tourists and domestic visitors in October 2000 during the initial terrorist activities. The drop was almost 60% for inbound tourists, and about 10% for domestic ones.

The difference between inbound and domestic tourists increased in the following months. Indeed, after the initial decrease, domestic tourists' overnights in hotels rebounded and even increased, while the overnights of inbound tourists continue to decrease. For example, a comparison of October 2000 with October 2001 shows an 80% decrease for inbound tourists, and a 20% increase for domestic tourists.

<Insert Figure 1 Here>

Notice that at least part of the quick recovery in domestic tourism may be a result of price reduction. However, this price reduction effect is only part of the story. Most importantly, it does not seem to effect international tourists. In addition, the best deals were available on January 2001[1], and the increase in local tourism continues after this date.

Another indication for the non-linear effect of the terrorist attacks on local residence comes from an investigation of Israeli coffee shops. Whereas the terrorist attacks led to an initial decrease in the popularity of coffee shops, there was an increase in the revenues of coffee shops in Israel in 2002 and 2003 (see BDI, 2003). The pattern of hotel and coffee shop visits on the part of Israeli consumers is similar to the statistics about flying after the 9/11 disaster (see Rabinski, Berktold, Smith, and Albertson, 2003; see also Gigerenzer, 2004). However, the peculiar thing about the Israeli situation is that there has been no decrease in the number of terrorist attacks during the period of recovery (ICT, 2004).

Examination of recalled responses to terrorist attacks suggests that this nonlinear trend occurs within individuals. In Yechiam, Barron, and Erev (2003) we asked 152 Haifa residents (in a short telephone survey) to recall their responses to the recent wave of terrorist attacks. Forty percent of the respondents reported that they planed to decrease their restaurant visits in the area. However, 42% of them changed their original intention after a short period (of about a month, on average). Only one respondent exhibited the opposite pattern.

2. A controlled study of the effect of personal experience.

The field data summarized above are consistent with the assertion that the sensitivity of local residents to repeated terrorist attacks diminishes with personal experience (of being exposed to, but not hurt by these attacks). However, the main evidence involves only one set of dependent observations: the behavior of Israelis during one period. And as noted above, other factors are likely to contribute to the observed pattern. In order to clarify the effect of personal experience we chose to study it in a controlled experiment.

In the present context, experience refers to the opportunity to decide between a safe alternative (e.g., "stay at home") and a riskier alternative that exposes the decision maker to a small probability of being attacked. During the Intifada almost any occasion where local residents go to a public place (walking in the street or seating in a café) implies a selection of the risky alternative. Obviously, in most cases the experience has a "good" outcome: "No attack." Under the personal experience hypothesis these common experiences are expected to reinforce the tendency to participate in similar activities in the future. That is, this experience contributes to the tendency of local residents to take the risk associated with staying in hotels, dining out, and visiting malls in Israel.

Previous experimental studies that support the personal experience hypothesis focus on situations in which personal experience was the sole source of information (e.g., Barron and Erev, 2003; Hertwig, Barron, Weber, and Erev, 2004). In these situations personal experience leads to a tendency to underweight low probability events. People behave as if they rely on recent experiences and overweight the typical outcomes. The main difficulty in generalizing this pattern to the current context comes from the fact that in context of terrorist attacks, decision makers can

develop good approximation of the relevant outcomes and their probabilities without relying on personal experiences.

To improve our understanding of the role of personal experience in the current context, the present research examines its effect in a laboratory setting in which the payoff distributions are known. Three experimental conditions were compared. In Condition Description-100 participants were asked to allocate 100 choices between a safe and a risky option. They did not experience the outcome of their choices. In the Experience condition, participants actually made these choices and were presented with the outcomes following each choice.

In a third condition (Description-Binary) participants were asked to choose only once between the risky and safe options, and were told that the computer will play this choice 100 times. This condition was added to simulate the description condition faced by international tourists, who have to decide only once whether to travel (and spend time) in an area under terrorist attack.

It was predicted that participants in the Experience condition would choose the risky option to a larger extent than in the Description conditions due to the fact that the outcomes of most of their risky choices are reinforcing. In addition, we predicted an increase in the proportion of "R" choices in the Experience condition as a function of time.

Method

Participants: Seventy-eight Technion students participated in the experiment (39 men and 39 women). Participants were randomly allocated to the three conditions: Thirty to the One-choice Description condition, 24 to the Description-100 condition,

and 24 to the Experience condition. The proportion of men to women was equal under all three conditions.

Procedure and measures: Three experimental conditions (Description-100, Description-Binary, and Experience) were compared. In Condition Description-100 participants were given the following instructions: "Your payoff in this experiment will be 2000 Agorot (showing up fee) [4.5 agorot were equal about 1 US cent] minus your loses during the experiment. Loses will be accumulated during 100 trials. In each trial you will play a gamble with negative outcomes. The outcomes of the gambles will be determined by the color (Red or Yellow) independently selected by the computer in each trial. Please indicate the number of trials that you want the computer to play the gamble (a total of 100 choices)".

S (Safe)	R (Risky)
Lose 8 agorot if Red occurs (p = 0.005) Lose 2 agorot if Yellow occurs (p = 0.995)	Lose 200 agorot if Red occurs (p = 0.005) Lose 1 agora if Yellow occurs (p = 0.995)
The computer will play this gamble (0 to 100) _____ times	The computer will play this gamble (0 to 100) _____ times

The R option is riskier because it includes a substantial penalty that is realized with a small probability. The order of the two options was randomized (they were called "A" and "B" in the study).

In Condition Description-Binary participants were given the same instructions except for the last sentence, which read: "Please indicate which gamble you prefer to

play (this gamble will be played 100 times by the computer)". They were then asked to circle the option that they prefer.

In the Experience condition participants were given the following Instructions: "Your payoff in this experiment will be 2000 Agorot (showing up fee) minus your loses during the experiment. Loses will be accumulated during 100 trials. In each trial you will have to select a gamble (by clicking on it). The outcomes of the gambles will be determined by the color (Red or Yellow) selected by the computer after you make your choice".

They were then presented with the computer screen that appears in Figure 2. The screen included the complete information of the payoff distributions. Thus, participants in the Experience condition were exposed to the same information as participants in the two Description conditions. Following each choice, the computer selected the color (Yellow with p =0.995, Red otherwise), which occupied the bottom panel of the form for one second. At the same time, the implied payoff was presented to the decision maker.

<Insert Figure 2 and 3 here>

Results and Discussion

The proportion of "R" choices was 0.69 in Condition Experience and 0.42 in Condition Description-100. This difference was significant ($T(46) = 1.95$, $p < .05$, one tailed in the specified direction).

To facilitate comparison of Condition Description-Binary and the other conditions, we analyzed the modal response of each participant. The percentage of individuals who selected "R" most of the time was 67% (16 out of 24) in Condition

Experience, and only 41% and 40% in Conditions Description-100 and Description-Binary, respectively. The differences between the Experience condition and the two Description conditions were both significant ($Z = 1.74$, $p < .05$; and $Z = 1.95$, $p < .05$, accordingly).

Figure 3 presents the proportion of "R" choices as a function of time (averaged in blocks of 5 trials) in Condition Experience. As predicted, the results reveal an increase of "R" choice with experience. The difference between the first half (.58 choices of "R") and the last half (.67 choices) was significant ($t(23)=2.65$, $p < .05$). Moreover, the initial (trial 1) proportion of "R" choices in Condition Experience was below 50% and similar to the observed proportion in the Description conditions (the difference is insignificance).

One might argue that many of the participants in the Experience condition were never exposed to the severe negative outcome of -200. This would imply that the results focus on situations with very small probabilities. Two replies are possible. First, that this is indeed the case; our goal was to model a decision-making situation with some similarity to the rarity of a terrorist incident. It appears that in such situations, direct experience leads to more choices of risky alternatives.

Secondly, an in-depth examination of the results of the (four) participants who did receive the severe negative outcome suggests that the results might be more general. According to the recency explanation, participants who experience the severe penalty for choosing "R" may revert back to choosing it after experiencing safe outcomes. In reality, after a single instance of the severe negative penalty (-200) followed by safe outcomes (-1), all four participants had more "R" choices than "S" choices.

General Discussion

Evaluation of the effect of the 2000-2003 wave of terrorist attacks in Israel reveals an interesting difference between the reaction of local and international tourists. Whereas both groups showed high initial sensitivity to the attacks, many of the activities of local residents quickly rebounded back. For example, a comparison of number of night spent in hotels a year after the beginning of the attacks shows an 80% decrease for inbound tourists, and a 20% increase for domestic tourists. Moreover, despite the sharp decrease in international tourism, there was an increase in the revenues of Israeli coffee shops in 2002 and 2003.

The present analysis highlights one contributor to this pattern. A laboratory experiment shows that students tended to exhibit high sensitivity to low probability risks when making decisions based on a description of the possible outcomes. However, this sensitivity diminishes when decision makers can rely on personal experience (of being exposed to the risk). In other words, we suggest that the fact that local residences are repeatedly exposed to the risk of terrorist attacks is sufficient to reduce their sensitivity to this risk.

We believe that the current analysis has two attractive features. First, it demonstrates how complex social processes (reaction to terrorism) can be related to the basic properties of human choice behavior. A second attractive feature involves the clear policy implications that shed light on well-known successful interventions.

The most important implication is the suggestion that the negative effects of rare terrorist attacks can be reduced by ensuring that citizens continue to partake in relatively safe leisure activities. Interestingly this suggestion summarizes one componant of Mayor Rudolph Giuliani's response to the September 11 attack in New York City. Giuliani suggested that citizens should invest less in direct contributions

(like helping digging and collecting blankets), and spend more time shopping and dining in New York. While this suggestion seemed counter intuitive at the time, the current analysis suggests that it was productive for reducing the negative long-term economic effect of the attack.

Interestingly, this policy is related to some of the most successful clinical methods of treating disorders such as phobias and acute stress syndromes. Sufferers of these disorders avoid objects, people, or situations that can lead to a negative outcome. The basic idea behind most successful treatments involves re-introduction in a protected environment, and the establishment of safe experience. For example, in exposure treatments the patient is exposed to the phobic stimulus as part of the therapeutic process (Foa and Kozak, 1986). Another example appears in the treatment of battle stress. The well-known intervention principles of proximity, immediacy, and expectancy (e.g., Artiss, 1963; Salmon, 1919) imply that the treatment should be carried out as quickly as possible (immediacy) in a safe environment as close to the battlefield (proximity), with a clear expectation of returning to duty (expectancy). The present analysis suggests that the success of these methods can be driven by the same factors that influence decision-making in experimental settings. Certain phobias and stress disorders can be described as the overweighting of rare events (Kleinknecht, 1982), and personal experience can reduce this bias (Foa and Kozak, 1986; Solomon and Benbenishty, 1986). Under this interpretation of the results, initial terrorist attacks create phobia-like responses. However, when the attacks are rare, experience with the environment provides a therapeutic-like process that reduces the long-term effect of terrorism.

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Footnotes page

[1] This assertion was supported with conversations with four travel agents that specialized in finding vacation deals for organized groups.

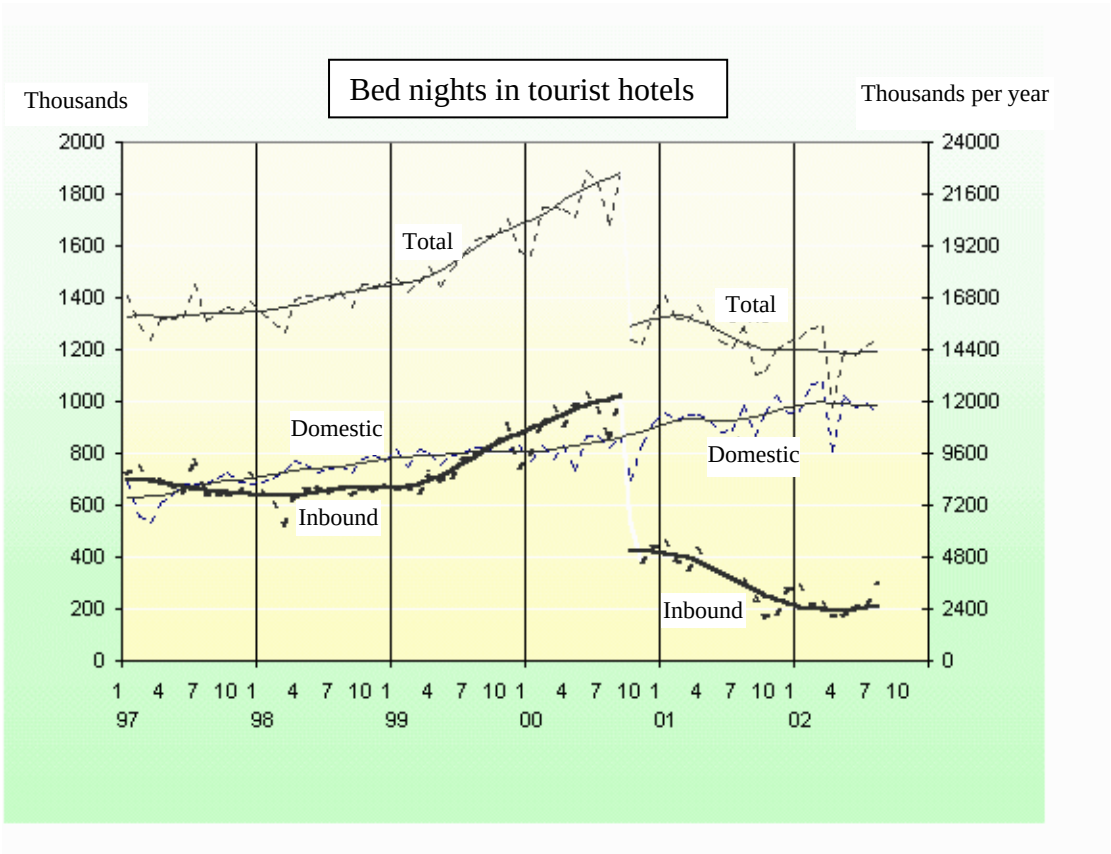

Figure 1: Bed nights of domestic and inbound tourists in Israeli tourist hotels from January 1997 to August 2002: seasonally adjusted average (dashed line) and trend by 1,000 bed nights (ICBS, 2002. Used with permission).

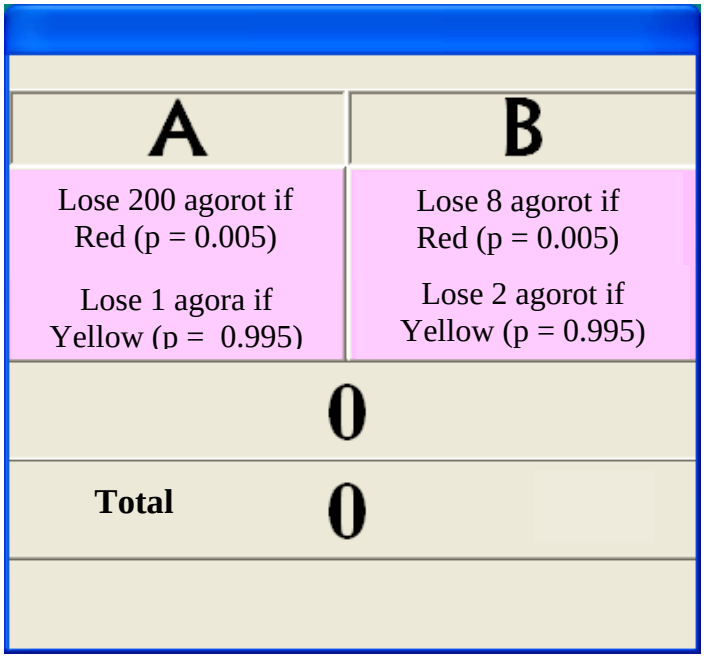

Figure 2: The choice task displayed for players in the Experience condition. Below the two buttons is the current payoff (initially 0), and the accumulating payoff (initially 0). The color (yellow or red) occupies the pane below the accumulating payoff.

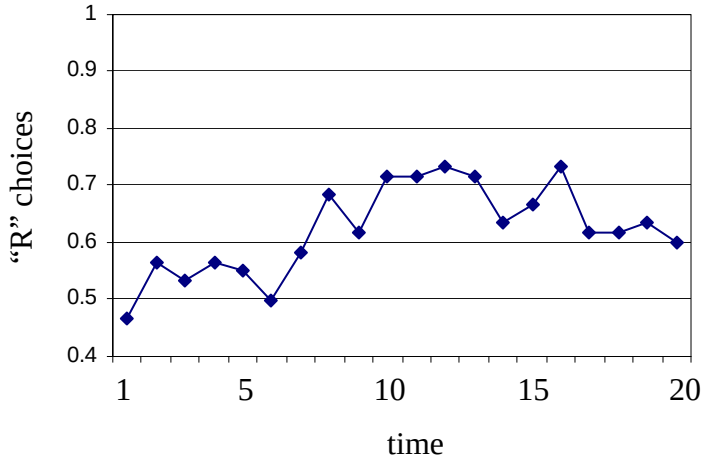

Figure 3: Experience condition: Proportion of "R" choices as a function of time (in blocks of five trials).