# Willingness to Fly

**Thomas W. Miller**

**Abstract** The airline industry has suffered deep declines as a result of the COVID-19 pandemic. In addition to governments placing restrictions on air travel, many passengers are afraid of flying due to anticipated health risks. Consumer research can help airlines find perferred seating configurations.

**Keywords** Airline travel · Conjoint analysis · Consumer behavior · Measurement · Personal health

## 1 Will air travelers pay for social distancing?

We weigh competing objectives when booking airline flights online. Nonstop flights are more convenient than one-stop or multi-stop flights. Amenities differ across airlines and seating sections within planes, with first-class seating being better than business class, and business class better than coach. Just as ticket prices vary across travel and seating options, they vary across the dates of travel and days of the week, with holidays more expensive than non-holidays and weekdays more expensive than weekend days. There are many factors to consider when making airline travel plans, and there are trade-offs between travel benefits and ticket prices.

Suppose a traveler must fly from Los Angeles to New York City for a family emergency. Getting to the destination quickly is essential, so the traveler will be choosing a nonstop flight. This is a 2,500-mile flight that takes five hours.

A typical Boeing 737-800 is about twelve feet wide in the main cabin. There are fourteen rows of economy coach seats with six seats per row, three on each side of the aisle. When all seats are available for booking, there are $14 \times 6 = 84$ economy coach seats with rows numbered 20 to 33. To accommodate travelers' preferences for social distancing, airlines are evaluating three reduced seating configurations: two of three seats available, one of three seats available, and

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Orme (2020) and Orme and Chrzan (2017) review relevant conjoint analysis methods.

**Fig. 1** Airline Ticket Ranking Task

Rank these tickets from 1 (most likely to buy) to 8 (least likely to buy):

☐   $175, all seats available

☐   $700, two of three seats available

☐   $350, one of six seats available

☐   $175, one of three seats available

☐   $700, one of six seats available

☐   $525, one three seats available

☐   $350, two of three seats available

☐   $525, all seats available

one of six seats available. Consider the ranking task shown in figure 1 and the reduced seating configurations illustrated in figure 2.

Those familiar with experimental design will note that this ranking task has four seating options (all seats available and three reduced seating configurations) and four price levels ($175, $350, $525, and $700). A completely-crossed $4 \times 4$ design would have sixteen treatment combinations. The eight items in the ranking task correspond to cells in a balanced fractional factorial design with each seating option and each price level represented twice.
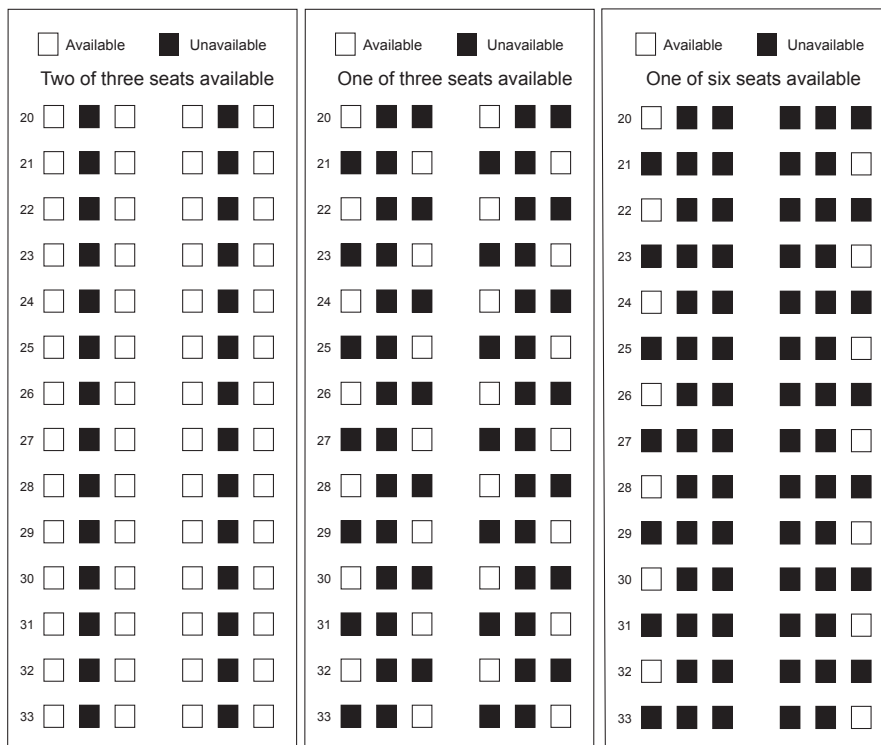
Figure 3 shows one traveler's responses to the ticket ranking task. As the traveler ranked airline tickets, she no doubt weighed their prices against a desire to maintain social distance between herself and fellow travelers. Ranks reflect preferences. What do this traveler's ranks suggest about her preferences? How much is she willing to pay to have more distance between herself and others?

If the woman were traveling between cities less distant from one another, say between Washington D.C. and New York City, then she might consider driving rather than flying. Ranks or choices across modes of transportation show a person's willingness to fly. How could we design a choice-based conjoint study to evaluate willingness to fly? What type of analysis would be needed to reveal differential preferences across groups of travelers identified by age or income level?
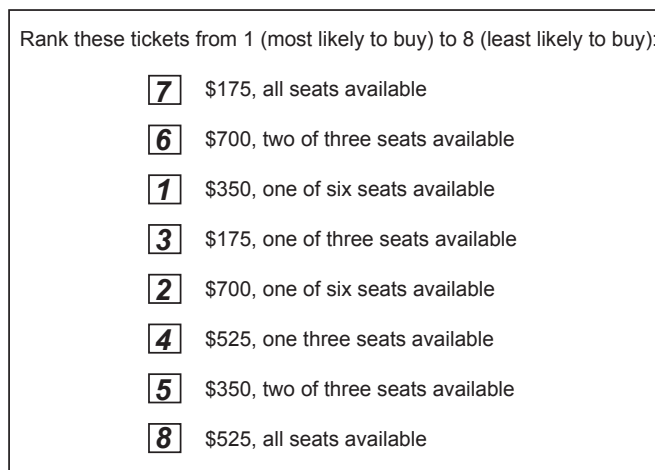
## 2 About the Author

Thomas W. Miller is faculty director of the data science program at Northwestern University, author of six books about data science, and owner of Research Publishers LLC.

**Fig. 2** Reduced Seating Configurations



**Fig. 3** One Traveler's Responses to the Airline Ticket Ranking Task

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