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# “PHYSICAL AND SITUATIONAL INEQUALITY ON AIRPLANES PREDICTS AIR RAGE”

By Katherine A. DeCelles, and  
Michael I. Norton

(and Emily Baro)

**“THE INCREASING  
INCIDENCE OF  
“AIR RAGE” CAN  
BE UNDERSTOOD  
THROUGH THE LENS  
OF INEQUALITY.”**

We posit that the modern airplane is a social microcosm of classbased society, and that the increasing incidence of “air rage” can be understood through the lens of inequality. Research on inequality typically examines the effects of relatively fixed, macrostructural forms of inequality, such as socioeconomic status; we examine how temporary exposure to both physical and situational inequality, induced by the design of environments, can foster antisocial behavior.

**“WE SHOW THAT PHYSICAL DESIGN THAT HIGHLIGHTS INEQUALITY CAN TRIGGER ANTISOCIAL BEHAVIOR ON AIRPLANES.”**

We use a complete set of all onboard air rage incidents over several years from a large, international airline to test our predictions. Physical inequality on airplanes—that is, the presence of a first class cabin—is associated with more frequent air rage incidents in economy class. Situational inequality—boarding from the front (requiring walking through the first class cabin) versus the middle of the plane—also significantly increases the odds of air rage in both economy and first class. We show that physical design that highlights inequality

can trigger antisocial behavior on airplanes. More broadly, these results point to the importance of considering the design of environments—from airplanes to office layouts to stadium seating—in understanding both the form and emergence of antisocial behavior.

Recent media attention has been devoted to the phenomena colloquially known as "air rage": a form of antisocial behavior by airplane passengers toward crew members threatening flight safety. Such incidents and staff, or for airlines. Although virtually the antecedents of this phenomenon, popular airplanes, frustrating delays, an alternative view: the form of class-based passengers through both presence of a first-class boarding procedure (where the first class cabin), like on airplanes - physical (boarding location) - trigger aggressive behavior. Durkheim scholars assert that social class - individuals' relative rank in the socioeconomic hierarchy, affect critical outcomes and behavior. Economic scholars often conceptualize class as socioeconomic status, comprised of relatively chronic and macro-structurally determined factors, such as education, income, and geographic location. Our theoretical account suggests that inequality also manifests in everyday environments via both physical and situational factors. We argue that both physical and situational inequality - ~~can result in antisocial behavior~~ increase the salience of individuals' rank in the socioeconomic hierarchy, and shapes individuals' likelihood of antisocial behavior.



We define physical inequality as inequality in physical space or amenities in the built environment; for example, companies might provide cubicles for staff but private offices for executives, and many public spaces, from stadiums to airplanes, have tiered seating systems. Second, within environments with physical inequality, we refer to variation in the salience of that physical inequality as situational inequality: for example, a floor plan that requires staff to walk past executive offices to arrive at their cubicles, or stadium or airplane seating that requires passing through the expensive seats to arrive

at the less expensive ones. Indeed, previous research suggests that people's perceptions of their relative socioeconomic status are influenced by situational factors and that the salience of inequality exerts an impact, as evidenced by poorer health outcomes in impoverished neighborhoods that border wealthier areas.

We situate our research in the common experience of airplane travel, suggesting that airplanes serve as a microcosm of class-based society that can expose people to both physical and situational inequality, resulting in greater odds of antisocial behavior in the form of air rage. First, we hypothesize that economy pas-

We argue that exposure to both physical and situational inequality can result in antisocial behavior. Our perspective augments research on inequality in several ways, research typically

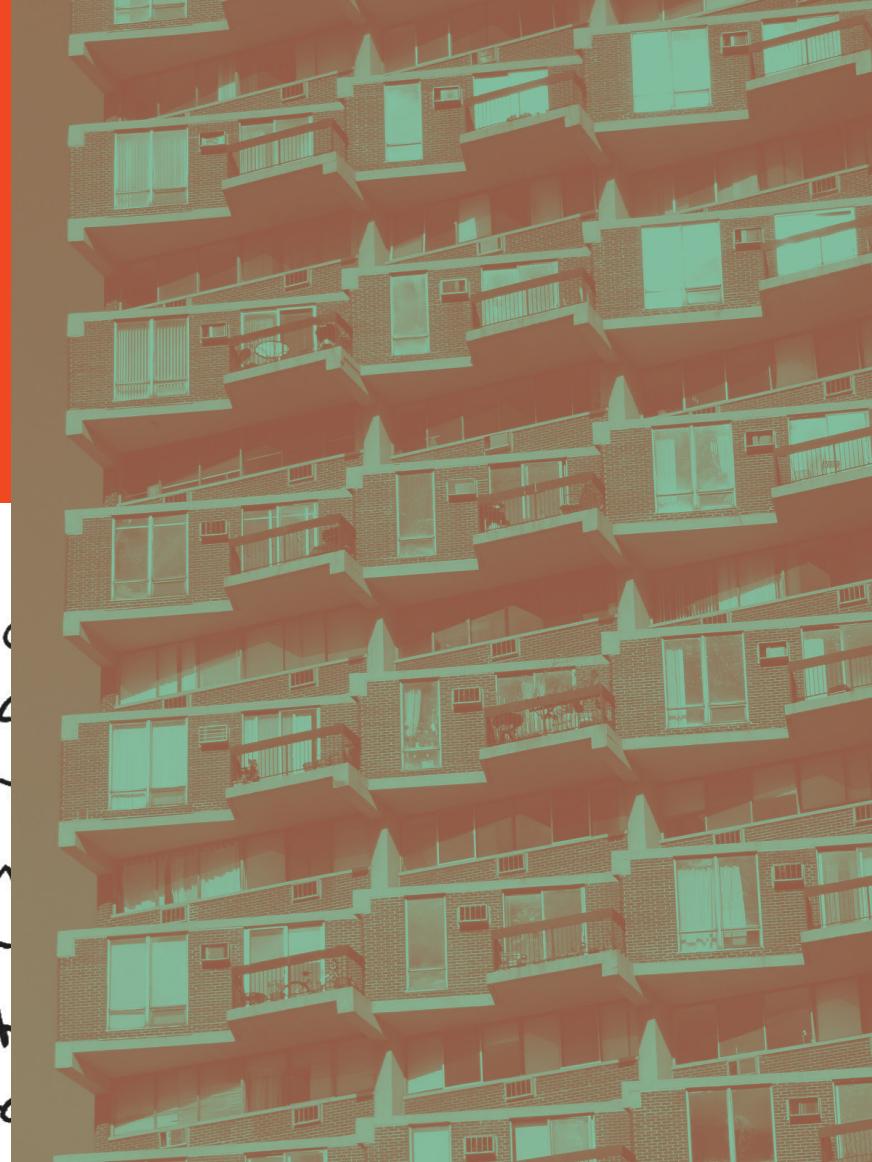
restrictural factors, such as income, including violent show that in addition to other temporary exposure to physical inequality placed in ones "class" flight - relates to antisociality - being reminded of a procedure - further builds on recent research of inequality does relatively higher social class inequality increases antisocial behavior across individuals.

We build into people's everyday environments - such as the modern airplane - and that exposure to these forms of inequality can trigger antisocial behavior. Analyses reveal that air rage is more common in economy class on airplanes, and inequality is physically present kind in both economy and first class when inequality is situationally salient. We extend research demonstrating that the salience of inequality increases prosocial behavior by higher class individuals, showing that temporary exposure to physical and situational inequality leads to antisocial behavior among individuals in both higher and lower classes. Moreover, we explore a novel predictor of inequality induced antisocial behavior - the design of airplane environments - augmenting research on macrostructural forms of inequality.

greater odds of air rage among first class passengers when situational inequality is present: when flights are boarded from the front versus the middle of the airplane. To test our predictions, we obtained a private database of all incidents of air rage from a large international airline over several years (circa 2010) of between 1 and 5 million flights. (We present a range to protect airline confidentiality.)

The onboard incidents that were mined the base rate of air rage (i.e., the <sup>61/74</sup> ~~onboard~~ account, air rage is relative- with first class (incidence rate of 1.58),  $P < 0.0001$ ). The incidence of air significantly different from the inci-  $P < 0.0001$ ) and without ( $t = 8.02$ , ic regression with robust SEs, and r or not a flight contained an incident controls for commonly invoked ex- pectation) and seat width, delay amount, ls for flight distance, number of seats, al. We first examined how our control ion, class (models 1 and 2), planes with longer delays, and domestic mparatively greater odds of air rage ificantly related to air rage and seat rage in model 1 ( $P = 0.05$ ), but signifi- model 2 ( $P < 0.01$ ). In first class (model 1) with larger cabin areas, and longer width, delay length, and international/ ge. The effects of additional control

the presence of first class on an air rage in economy. Table 2 (model homy incident are 3.84-times higher  $0.001$ ); dividing the coefficients from (0 delay hours), presence of first class uivalent to the effect of an additional sized that situational inequality— predict greater incidence of air rage planes predicted 2.18-times greater dle boarding ( $P = 0.005$ ; model 2), an min flight delay (0.772 front board- sis that situational inequality— board et greater incidence of air rage in planes predicted 11.86 greater odds of rom the middle ( $P = 0.013$ ; model 3). the coefficient for delay hours was not e are unable to provide an estimate fferences in the types of air rage in dents in first class were more likely g a passenger's expression of strong 27.8% in economy class), whereas ut from emotional outbursts (62% of



n staged.

In first class boarding, the visibility of different types of anti-society advantaged and disadvantaged

the incidents in economy class vs. 2.2% in first class; proportion comparison z-tests all  $P < 0.01$ ). These preliminary results are consistent with research linking high status to displays of anger and low status to reduced self-control (30, 31), and suggest that the visibility of inequality may induce different types of antisocial behavior among the relatively advantaged and disadvantaged. Class-based seating is both more prevalent and more unequal in recent years, with first class cabins claiming an increasingly large share of total space (32). As both inequality and class-based airplane seating continue to rise, incidents of air rage may similarly climb in frequency. Building on previous interdisciplinary research on inequality, we demonstrate that both physical and situational factors present in everyday environments are associated with dangerous, class-specific antisocial behaviors among both the “haves” and the “have nots.”

Our study was approved by the University of Toronto Ethics Review Board (Protocol 22624) and did not require informed consent. We examined a population of flights from a large international airline over several years (circa 2010). We used a private database that contained all documented disruptive passenger incidents during this time period ( $n = 1,500$  to 4,000). Of these, we selected only those incidents that occurred on board and could be matched to a flight record; we used these data in our analyses (see SI Methods for additional details). The airline classified each incident by flight number and date, and recorded disruptive passengers’ seating class, gender, and incident type (e.g., belligerent behavior or emotional outburst). We combined the air rage incident data with a proprietary database of the population of flights from this airline in the time period ( $n = 1–5$  million flights). The flight database included flight characteristics (e.g., plane model details and flight details, such as departure and arrival locations, delays, and distance). Using the plane models indicated in the dataset, we coded the physical layout of each airplane with readily available online information from the airline, including seat and cabin dimensions. We operationalized physical inequality on the plane by the presence or absence of first class on all flights; we operationalized situational inequality by boarding type—front boarding or middle boarding planes—within flights that contained a first class cabin.

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