Privatization of Public Space

Morteza Farhoudi

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**Exploring the Unintentionally Exclusionary Aspects
of the Commute Behavior of Subway Users**

(Case Study: Tehran Subway)

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The title of this thesis is inspired by the following book chapter:

Abstract

This MRP presents the results of a qualitative study designed to explore the extent to which commuters' attitudes and behaviors inadvertently foster exclusionary practices towards other riders in Tehran Subway system. Thirteen frequent users of the subway were selected as participants and asked to keep a diary documenting their observed and practiced behaviors within subway cars over the course of two weeks. The data collected was analyzed using thematic analysis. The findings indicate that subway users unconsciously and implicitly assert a sense of ownership over seats and spaces within the subway cars, leading to the privatization of public spaces. The study discusses the implications of this phenomenon on the inclusiveness of subway interiors and suggests the importance of promoting indirected citizenship behaviors rather than directed citizenship behaviors. Consequently, the MRP suggests a range of design interventions, including product, environment, service, and policy recommendations, to increase awareness and engagement in indirected citizenship behaviors on public transportation.

Keywords: indirected citizenship behavior, unrealized citizenship behavior, ridership behavior, subway studies, inclusive design.

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Lastly, I would be remiss in not mentioning my family for their unwavering support.

To my family.

List of abbreviations

CB	Citizenship Behavior
OCB	Observed Citizenship Behavior (by participants)
DCB	Directed Citizenship Behavior
ICB	Indirected Citizenship Behavior
UCB	Unrealized Citizenship Behavior
HMS	Human-machine system

List of definitions

Organizational Citizenship Behavior is defined as actions and behaviors that are not required by employees, but that benefit the team and promote greater organizational effectiveness and efficiency. By omitting "organizational" from this term, the concept of **"citizenship behavior"** can also be applied at a societal level, referring to actions that are not mandatory for citizens, but that contribute to the well-being of society (Researcher).

Privatization of public space is often used in urban planning studies to refer to the production of public spaces by private sectors. However, in this study, it is used in a different sense, as introduced by American sociologist Lyn H. Lofland in her book "A World of Strangers: Order and Action in Urban Public Space" (1985). Lofland uses the term to refer to the creation of a symbolic bubble around oneself to minimize social interaction with strangers, which symbolically transforms the social situation.

Geographically privileged riders are riders who take the train in the first station(s) of a line—or to some extent, the intersection of the lines (Researcher).

Indirected Citizenship Behavior refers to citizenship behavior that is not directed at any specific individual or group. Instead, it is typically motivated by a desire to contribute to the greater good or to benefit society as a whole (Researcher).

Unrealized Citizenship Behavior refers to any form of intended or planned citizenship behavior that is not acted upon—due to various reasons, such as uncertainty, lack of opportunity, procrastination, etc. (Researcher)

CONTENTS

Chapter 1   **Introduction**

Chapter 2   **Literature review**

List of Figures

List of Tables

1

INTRODUCTION

Project context • Problem statement • Outline of the study

"Never believe that a few caring people can't change the world. For, indeed, that's all who ever have."

—Margaret Mead

Project context

As a resident of a large city who relies on public transportation for daily commuting, it is likely that you have experienced the difficulty of finding a seat on a train if your home or workplace is not located in close proximity to the first few stations of a line, or to some extent, the intersection of two lines. This is because, in such cases, the demand for seats often exceeds the available space and they are typically already occupied by those who boarded the train at earlier stations. The accompanying subway map, featuring two intersecting lines, illustrates this phenomenon; with the green-red color code indicating that those who board in the green areas are more likely to secure preferred seating/space.
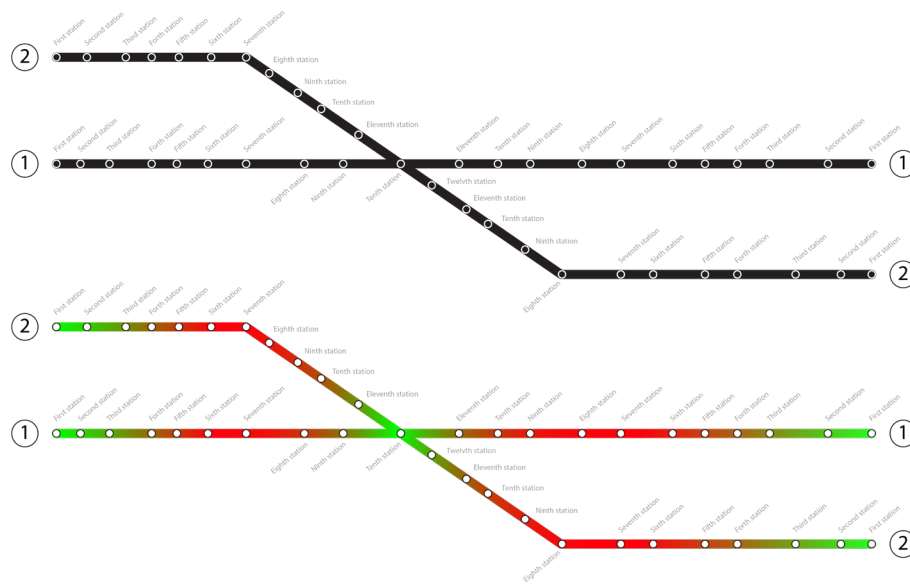
Figure 1: A schematic subway map (Author)

This particular phenomenon shows that, in terms of inclusivity, the interior space of subway cars inadvertently creates exclusionary conditions for a significant number of commuters. This seemingly insignificant problem serves as the starting point for a series of issues that may contribute to the

stressful nature of commuting (Bhat & Sardesai, 2006) (Bhat & Sardesai, 2006; Tse et al., 2006). Additionally, research by Wener et al. (2005) indicates that this stress can extend beyond the commute and negatively affect individuals' work and home life, thereby diminishing their overall quality of life (Costal et al., 1988).

Given the critical role of the commute experience in people's work and home life, and the increasing popularity of mass transportation due to environmental concerns and urban congestion (Stéphane, 2012), it is essential to address the design of subway cars' interiors from an inclusivity perspective. This is especially important because this mode of daily transport, despite being a transient stage, serves as a crucial link between the workplace and home.

Problem statement

The interior space and seating capacity of metro cars is inadequate in relation to the volume of riders. As a result, a select group of commuters, who reside or work in proximity to the initial stations of the line, often have the advantage of securing preferred seating and space, while those who board the train at intermediary stations are frequently compelled to stand. Therefore, from a standpoint of inclusivity, it can be posited that the behavior of those who are able to catch the train at its early stages, mediated by the design of the interior space of subway cars, inadvertently engenders exclusionary conditions towards a significant proportion of commuters.

Research questions

Main research question: In what ways, if any, commuters attitudes/behaviors are unintentionally exclusionary toward other riders?

- In what ways do people practice—or refrain from—citizenship behavior within subway cars?

Research aims

The International Association of Public Transport (UITP) sees public transport at a turning point in its history, where it must find a way to transition from traditional service moving masses of people, to a service offering customized solutions (UITP, 2020). Offering such customized solutions are possible only through a clear understanding of the factors affecting people's choice of means of transport and attitudes towards transport (Burian et al., 2018).

In light of this, the purpose of this research is to investigate the ways in which the attitudes and behaviors of subway riders may inadvertently perpetuate exclusionary practices towards certain groups of riders, with the ultimate goal of gaining a deeper understanding of the subtle and implicit barriers present within interior spaces of subway cars. By illuminating these barriers, the study aims to:

- Identify potential avenues for enhancing the inclusivity of public transportation, a value that is highly regarded within the field.
- Expand the discourse on inclusivity in the design of public spaces.

Research scene

Site selection: Tehran Subway

As posited by Yin and colleagues (2021), rail transit has a more pronounced effect on well-being in developing countries in comparison to developed countries. This viewpoint highlights the value of studying the Tehran subway system, a rapidly expanding rail transit system within a developing country context, as it has the potential to inform the implementation of similar systems in other developing countries.

A brief introduction to the Tehran Subway

Tehran, the capital of Iran and the largest city in Western Asia, has the busiest subway in the Middle East. It is regularly considered to be among the cleanest subway systems in the world (Railway-News, 2017). The carriages at the two ends of each train are women-only, but the use of them by women is optional, and men and women can travel together in other wagons.

Following is the map of the Tehran subway, as of May 2022:

Figure 2: The map of Tehran subway, as of May 2022 (Source: https://tinyurl.com/ynhdndms)

Although the Tehran subway is very crowded most of the time, considering the city's heavy traffic, many citizens believe that it is faster than other types of urban transportation. According to the statistics provided by the Tehran

Urban & Suburban Railway Company (TUSRC) in 2022,[1] the passenger count for the initial seven months of the preceding Iranian calendar year amounted to 154 million. However, the passenger count for the corresponding period in the current year has witnessed a substantial uptick, with a total of 221 million passengers. This data illustrates a significant augmentation in passenger traffic. Factors such as accessibility, affordability, convenience, fastness, etc. could explain this increase in the ridership.

The chart below displays the primary means of transportation for commuting to work/school in Tehran, along with their corresponding percentages (Figure 3). Notably, the Train/Metro, with 6.9%, ranks fourth among the most commonly used modes of transport. As mentioned in the previous paragraph, this percentage is growing at a rapid pace.
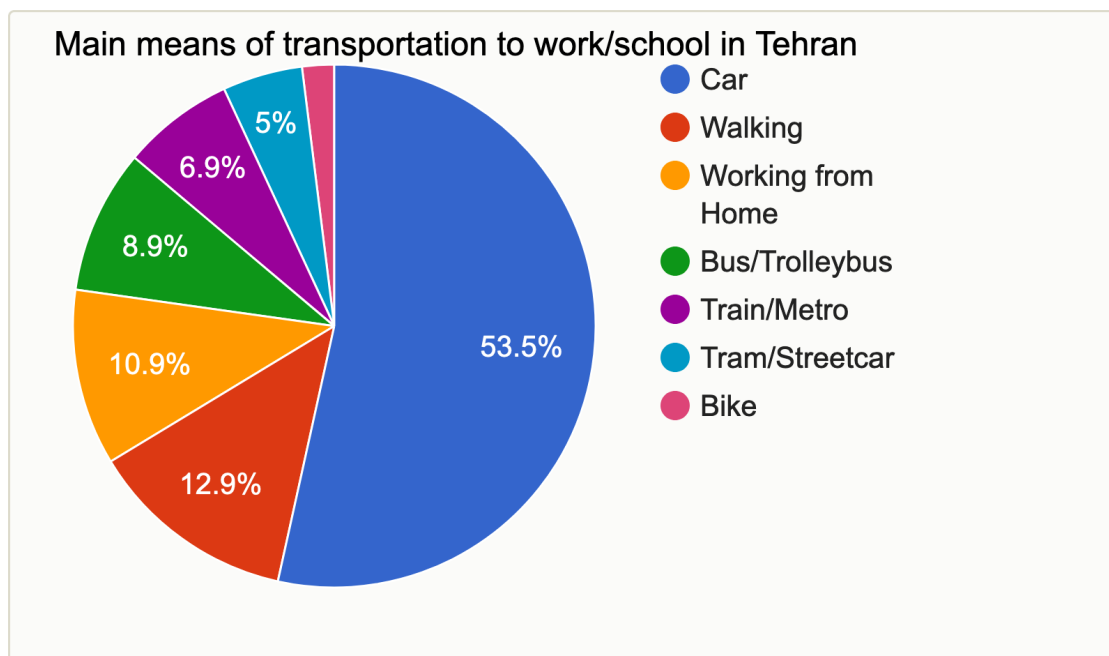
Figure 3: Main means of transportation to work/school in Tehran (source: https://www.numbeo.com/traffic/in/Tehran)

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1   https://tinyurl.com/mr3juhd9

Target population

Considering that culture, as the software of the mind (Hofstede, 2003), influences people's behavior, a brief introduction to the cultural context of the research scene, in terms of the cultural value dimensions, is provided (Figure 4). This chart gives an overview of the deep drivers of Iranian culture relative to other world cultures.
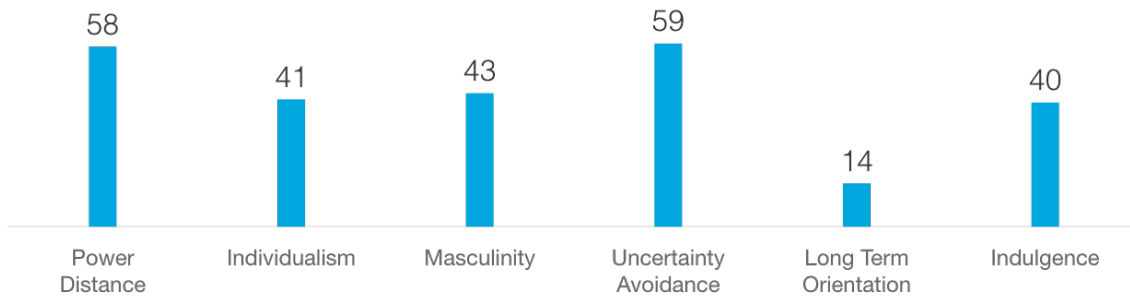
Figure 4: Iranian culture through the lens of the 6-D Model© (adapted from Hofstede Insights)

According to this chart, Iran is considered a hierarchical society with a collectivist culture that values loyalty and strong relationships. It is relatively feminine, emphasizing quality of life and well-being over competition and achievement. Iran has a high preference for avoiding uncertainty and a strongly normative cultural orientation. Finally, it has a culture of restraint, meaning that there is relatively strong control over desires and impulses.

These cultural value dimensions—to a varying degree—have the potential to influence people's behavior in public environments. The collectivist culture of Iran, for instance, encourages a sense of loyalty and responsibility towards fellow members of one's group, which could translate into practicing citizenship behavior towards strangers in public settings; or the focus on quality of life in Iran's relatively feminine society could also encourage

individuals to act in ways that promote the well-being of others in public settings.

The following points also aid in a better understanding of the Tehran Subway:

- According to a ranking of subway systems by length ("List of Metro Systems," 2023), Iran's subway system ranks 9th in the world. Tehran subway is by far the longest subway system in Iran.
- Tehran subway cars use a longitudinal arrangement (along the cars' outer walls).

Methodology

This research aims to investigate the phenomenon of citizenship behavior among subway riders, and the qualitative research methodology was selected for this purpose given its capability to uncover the implicit and taken-for-granted understanding of the phenomenon (Tracy, 2013). The lack of conscious awareness of the drivers behind the behaviors of subway riders necessitates a research design that minimizes interference and enhances validity. Thus, field studies, which are characterized by their low-interference nature, were chosen to carry out the research. The primary data collection method was on-site observation through participant observation and diary-keeping. This approach was deemed effective in identifying elusive trends (Tracy, 2013) and gathering data from highly mobile populations (Wiseman et al., 2005). Furthermore, a questionnaire was administered to gather additional information regarding participants' awareness of citizenship behavior in the subway.

Structure

The following paragraphs provide a summary of the chapters in this MRP.

Chapter 2 introduces the crucial role of public transportation in urban development, and emphasizes the importance of valuing inclusivity in public transport—as opposed to the exclusivity that is valued in private vehicles. Then points out a rising trend in subway studies that despite being promising, is more concerned with the machine aspect of these systems rather than the human element. It provides a succinct review of several notable qualitative studies that have a human-focused approach. And contextualizes the need for a human-focused study of Tehran subway cars' interior space.

Chapter 3 lays out the details of research methods and strategies. It begins with introducing the substantive and conceptual domains of the research. Accordingly, the rationale for research methods and strategies are provided, and details of each method (sample size, participant selection, data collection, and data refinement) and strategy (data analysis) are laid out.

Chapter 4 presents a descriptive analysis of the data with respect to the central research question. Then, it delves into a discussion of the ways in which the attitudes and behaviors of subway riders can negatively impact the inclusiveness of the interior space of subway cars, drawing on the main themes that were identified through the data analysis. Finally, the discussion considers the potential implications of such exclusionary practices on the relative popularity of public transit vis-à-vis private modes of transportation.

Chapter 5 based on the findings, contextualizes the issue of privatization of public space as a social dilemma; introduces script-based design method and the product influence framework as the appropriate approaches and means to design effective interventions; and presents a list of design solutions.

Chapter 6 presents the theoretical and practical contributions of the research, and while acknowledging the limitations, provides recommendations for further development and future research.

2

LITERATURE REVIEW

A trend in subway studies • A lack of human-focused studies • Contextualization of the need for human-focused studies

This chapter introduces the crucial role of public transportation in urban development, and emphasizes the importance of valuing inclusivity in public transport—as opposed to the exclusivity that is valued in private vehicles. Then points out a rising trend in subway studies that despite being promising, is more concerned with the machine aspect of these systems rather than the human element. It provides a succinct review of several notable qualitative studies that have a human-focused approach. And contextualizes the need for a human-focused study of Tehran subway cars' interior space.

Introduction

Transport, by giving people access to employment, education, markets, recreation, health care, and other services, plays a crucial role in urban development (Burian et al., 2018). In a mobile, global culture, even reifying social contacts and full social participation hinges on accessibility of transportation systems, both at the community and the intercity scale (Steinfeld & Maisel, 2012). However, if—the inclusivity offered by—public transportation is unable to compete with the increasing level of exclusivity offered by the automotive industry, it is likely that individuals will opt for personal transportation over public transport; such trend is suggested by Burian and colleagues (2018), where they suggest that despite economic, social and environmental advantages of using public transport—over personal means of commute, in many countries, the growing popularity of individual transport is reflected in a decrease in the volume of passengers carried by public transport.

A rising Interest in subway studies

Commuting, historically considered a transient aspect of daily life, has been a peripheral area of inquiry within the field of mobility studies. However, as urbanization has escalated and mass transportation systems have become more prevalent, there has been a notable increase in scholarly interest in the study of subway systems, as a vital component of sustainable transport policies (Yin et al., 2021).

With the 214 operating subway systems of 191 cities from 60 countries around the world (as of now, March 2023), and 31 metro systems that are currently actively under construction worldwide ("List of Metro Systems," 2023), as well as the expectations of unprecedented growth in population and travel in the next few decades (Lau, 2005), rail transit agencies are trying to find ways to transition from traditional service moving masses of people, to

services offering customized solutions (UITP, 2020). Finding such solutions, as previously mentioned in Chapter 1, is possible only through a clear understanding of the factors affecting people's choice of means of transport and attitudes towards transport (Burian et al., 2018), i.e., a more human-focused approach to the subway studies.

A lack of human-focused studies

By viewing subway systems as a human-machine system (HMS), a large body of the above-mentioned literature has focused on the machine aspect of these systems, with a predominant emphasis on engineering, economic, and environmental perspectives. However, there remains a dearth of research on the human element of these systems, specifically the riders.

The subsequent paragraphs provide a succinct review of several notable studies that center on the human element of subway systems.

Tonnelat and Kornblum (2017) conducted a study on the diversity and assimilation of immigrants on the New York City Transit Authority 7 subway line, which found that shared subway experiences can lead to a form of practical cosmopolitanism among riders. These findings are significant from an inclusivity perspective, as they demonstrate how shared subway experiences can aid newcomers in feeling at home in an alien city and foster a sense of "situational community in transit."

Thomas (2009), by recognizing the fact that social needs of public transport passengers are often neglected—both in practice and in research, examined the social environment of public transportation and found that seating layout can cause social discomfort. However, interactive behaviors such as talking and positive body language can mitigate this discomfort. These findings underscore the importance of positive attitudes and behaviors towards other

passengers for successful interpersonal interaction in public transport, ultimately making these environments more welcoming and inclusive.

A study conducted by Berkovich et al. (2013) examined the patterns of seat occupancy in subway cars in New York City. The results of the study indicate that there is a distinct preference among riders for seats located in proximity to doors, and a marked aversion to seating in bench spots between two other seats. These findings, by illuminating the specific behaviors associated with seat selection among riders, furnish authorities and designers with valuable insights into how to design the interior of subway cars in a manner that aligns with the preferences of riders, thus facilitating a more inclusive commuting experience.

While, in response to the ongoing increase in ridership, authorities, in collaboration with researchers and practitioners, have sought to optimize the efficiency of subway cars' interior and make them more accessible to a broader population, there appears to be a lack of knowledge regarding the role of commuters' attitudes and behavior, which are mediated by their perception of these environments, in making these environments more inclusive. These gaps in understanding underscore the need for more rigorous and systematic studies of the human element of these systems.

Contextualizing the need for human-focused studies

The illustration of a surge of passengers entering a subway car (Figure 5), a common occurrence in the Tehran Subway, serves as a visual representation of the issue of situational inequality present in these settings. Research by DeCelles and Norton (2016) on air rage suggests that exposure to physical and situational inequalities—that are built into people's everyday environments— can lead to antisocial behavior.

While this competition for desired seats and spaces, referred to as "a war" by Nelson (2011), is a daily and frustrating experience for a large number of commuters, it has gone largely unnoticed and is not widely recognized as an issue. It is often seen as an inevitable aspect of the subway system. However, it is crucial to acknowledge this phenomenon as an inequality issue and to investigate the negative effects it may have on the inclusivity of these environments. Further research is needed in order to take the initial steps towards addressing this problem.

Figure 5: A surge of passengers flooding into the subway car (Author)

3

RESEARCH DESIGN
Data · Data collection · Data analysis

This chapter lays out the details of research methods and strategies.[1] It begins with introducing the substantive and conceptual domains of the research. Accordingly, the rationale for research methods and strategies are provided, and details of each method (sample size, participant selection, data collection, and data refinement) and strategy (data analysis) are laid out.

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1   The terminology that is used in the research design section is offered by Vannini (2015). Vannini states that myriad journal articles mistakenly use research methods and methodologies interchangeably. He argues that research methods are procedures for the collection of empirical material, and research strategies are procedures for the treatment of data, such as data organization, analysis, and presentation. Vannini defines methodologies as bodies of knowledge, which encompass both practical applications of methods and strategies, as well as abstract reflections on pros and cons, and on epistemological foundations, which have accumulated over time.

Introduction

Given that the phenomena and properties of this research is the citizenship behavior—practiced by subway riders, and aptness of the qualitative research in accessing tacit, taken-for-granted, intuitive understanding of a phenomenon (Tracy, 2013) on the other hand, a qualitative approach is chosen for carrying out this research. And, as riders are not fully aware of the driving forces behind their decisions and behavior, for ensuring the validity of the research, field studies are chosen, for their low interference attributes. In particular, on-site observation by the participants (and keeping diaries) is the main data collection method, because of its effectiveness in discovering elusive trends (Tracy, 2013), as well as its aptness for gathering data from highly mobile populations (Wiseman et al., 2005). In addition, a questionnaire was administered to gather data on participants' awareness of citizenship behavior in the subway.

The following diagram shows the four elements of the scene of this research:

Phenomenon	—	Citizenship behavior
Field of study	—	Interior space of subway cars
Site	—	Interior space of Tehran subway
Participants	—	Frequent users of subway
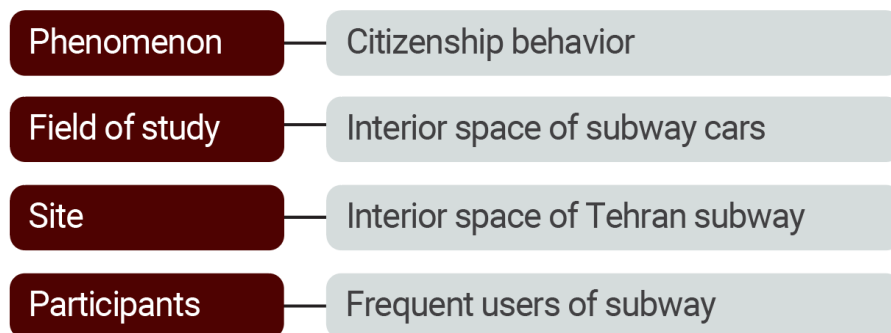
Figure 6: Elements of the scene of this research (Author)

Research design

Data collection

Sample size

Non-probability sample size recommendations for qualitative data are not common in the literature, and the few recommendations that do exist exhibit a certain degree of variability (Guest et al., 2006). And the majority of the literature does not make any specific recommendations but posits that sample sizes in qualitative research should be determined inductively and continue until "theoretical saturation[1]" is reached (e.g., Bluff, 1997; Byrne, 2001). The issue, as rightly pointed out by Guest and colleagues (2006), is that "although the idea of saturation is helpful at the conceptual level, it provides little practical guidance for estimating sample sizes for robust research prior to data collection."

In light of the above mentioned degree of variability and the lack of specific recommendations for sample size in qualitative research, determination of the sample size for this study were based on a research by Guest and colleagues (2006), in which, using data from their own study, they concluded that 88% of the codes they developed—when analyzing the data from 60 qualitative interviews—were created by the time 12 interviews had been conducted.[2]

Accordingly, by the means of a recruitment flyer—as well as the chain referral link technique (i.e., participants refer other participants) (Bernard & Gravlee, 2014), a total of 16 potential participants were approached. The recruitment

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1   Theoretical saturation refers to the point at which gathering new data provides no new insights into the studied phenomenon.
2   The determination of the number of participants was also based on a similar ethnographic study of the commute experience of the 7 train riders (in New York city), in which, Tonnelat and Kornblum (2017) employed 12 high school students to keep their diary of subway commute.

flyer used as a screener, asking for only the frequent users of the subway (i.e., those who use the subway more than 50 times a year.[1])

Considering that within the high power-distance context of the research site (i.e., Tehran Subway, Iran) (See Figure 4) citizenship behaviors are mostly expected from young adults, participants were chosen from university students and recent graduates—who use the subway frequently.

Gathering data

A total of 16 university students and recent graduates participated (10 male and 6 female). They were contacted via online call (Skype/GoogleMeet/WhatsApp), and were given an introduction to the project, and considering that the phenomenon being studied—and the unit of analysis—is citizenship behavior, a definition of citizenship behavior and a few examples of such behavior were provided (the definition of CB were also provided in the log sheet). Then they were informed that they will be 1) keeping a two-week diary of the citizenship behaviors that they observe—or practice—during their commute with the Tehran subway, and 2) answering an online questionnaire.

Details of these data collection methods are as follows:

- **Diary-keeping** (Subway trip log; see Appendix A)
  - Participants were given the log sheets (as a MS Word document), and instructed to maintain a diary of their trips with Tehran subway for two weeks (from 25 June to 6 July, 2022). Each day/entry of the log sheet asked for the observed/practiced citizenship behavior, it's time, brief demographic information of the engaged parties (i.e., the commuter practicing citizenship behavior, and the commuter to whom the CB is targeted), level of crowdedness (on a scale of 1 to 5[2]), and the name of the station.

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1   This threshold adapted from (Barkow & Canadian Urban Transit Association, 1991)
2   Crowdedness scale: 1) Not crowded, 2) Not too crowded, 3) Crowded, 4) Very crowded, 5) At capacity

- **Questionnaire** ('Citizenship behavior' awareness in subway - as a Google Form; see Appendix B)
  - In order to avoid influencing the observation and diary-keeping of the participants—i.e., ensuring the internal validity of research—a number of questions that were designed to address the very own opinion of the participants regarding the citizenship behavior, its relation to the inclusivity, and their potential/probable behaviors in the real world were organized in the form of a Google Form, and presented to them after their delivery of the subway trip log.
  - Participants were given the following introduction to the project (in the beginning of the Google Form):
    - In crowded cities, for those citizens who 1) are using subway for commuting between their home and workplace, and 2) their home/workplace is located anywhere other than the proximity of first few stations of a line—or to some extent, intersection of two lines—the chances are rare that they can get a seat during their ridership (i.e., because usually there are more people than there are space and seats, and the seats are already occupied by those who have taken the train in its first stations).
  - Then they were asked the following three questions:
    - Have you ever thought of this phenomenon? (Yes/No)
    - Do you consider this kind of 'privatization of public space' as an exclusionary behavior? (Yes/No/Other)
    - Imagine yourself as someone who takes the train in its first stations and gets the chance to sit (and the seats get fully occupied in the next few stations; i.e., no chance of sitting for those commuters who take the train in its midway stations). Being aware of this privilege, what would you do (i.e., towards other commuters) to consider your behavior as a "citizenship behavior"? (Long answer required)

Data analysis

For data analysis, the thematic analysis method—which is a method for identifying, analyzing, and reporting patterns (themes) within data (Braun & Clarke, 2006)—was chosen, for its aptness in systematic way of seeing, as well as processing qualitative and subjective information—such as a participant's experiences—using "coding". In doing so, the several phases of the thematic analysis offered by Braun and Clarke (2006) (i.e., data familiarization, data coding, theme development, revision) is used. Following headings discuss these phases in detail.

Data familiarization

The 13 subway trip logs included a total of 149 observed citizenship behaviors. First, those observations, which were not by the definition—that was provided to the participants—citizenship behavior, were eliminated. And for the purpose of conciseness, parts of information within each reported citizenship behavior, which were irrelevant to in answering the research question, were edited out. Entries such as "Today, I did not travel by subway." were also excluded. Then, the subway trip logs were translated into English. The outcome of this phase is a refined list of 132 observed citizenship behaviors (see appendix C for the full list in English).

Figure 7: A participant's subway trip log, July 2022 .

Also, in the process of refining and preparing the data for analysis, to enhance succinctness, the observed CBs in the 'subway trip log" were rewritten to incorporate the CB practitioners and CB targets, which were initially recorded in separate columns within the form, as reported by the participants.

Since capturing these randomly and momentarily practiced citizenship behaviors on camera was difficult, not to mention the ethical issues attached to taking photos of strangers in public places, using the textual OCBs', nine of them are represented via illustrations. Following are these illustrations and their corresponding OCBs.

Figure 8: An old man gives his seat to boy (Author)

Figure 9: A young lady offers her seat to a pregnant woman (Author)

Figure 10: A man offers his seat to a young lady in a crowded men's carriage (Author)

Figure 11: Seated passengers on a seat of 5 make space for the 6th person to sit (Author)

Figure 12: Men create space for the comfort of a standing woman in a crowded men's car (Author)

Figure 13: A sitting woman offers to hold a standing woman's baby (Author)

Figure 14: A woman assists another woman in a wheelchair with boarding (Author)

Figure 15: A young man holds open doors for the person running to board (Author)

Data coding

For the initial coding, with reference to the research question (i.e., In what ways, if any, commuters attitudes/behaviors are unintentionally exclusionary toward other riders?), each observed citizenship behavior (i.e., the data extracts) were coded for 1) the commuter(s) practicing CB, 2) the commuter(s) CB target at, and 3) the CB itself (e.g., offering a seat to an elderly). In fact, codes were initially identified, and then were matched with the data extracts. Following is the codebook that captures these three codes—with examples from the OCBs.

Table 1: The codebook developed for coding the Observed Citizenship Behaviors (OCBs).

Code definition	Color code	Example
The CB practitioner	🟢	A young college student; a middle-aged man; a middle-aged woman
The CB target	🟡	An old man, a weak old man, a pregnant woman
The CB	🔴	Offering their seat to others; helping a newcomer to find their destination station; offering to hold a standing rider's bag

The following box shows one of the OCBs coded using the codebook:

> To prevent him from falling, a young college student offered his seat to a weak old man who was walking with a cane.

Figure 16: An example of an OCB coded using the color codes (Author)

After coding all the data extracts, the frequency of each of the three codes are as follows:

- **The CB practitioner**: 136 (in a few OCBs, more than one CB practitioner were involved—e.g., a woman, and two men collaborated to make sure that the child who were separated from her mother (i.e., the mother took the train, but the child was left outside the train) finds her mother.)
- **The CB target**: 132
- **The CB**: 132

Theme development

For the purpose of effective theme development, the number of instances for the CB practitioners and CB targets' codes (i.e., the identity codes) were decreased, by merging similar identities of these agents into one group. For

example, "a young lady" and "a girl" were merged into one category and named "a young lady".

Considering that the word cloud[1] is a simple yet widely used plot to display and understand the structure of textual data (Koráb et al., 2022), to get an initial idea of the identities of the CB practitioners and targets, the identity codes of each group were used to create a word cloud.[2] Following are the results[3]:
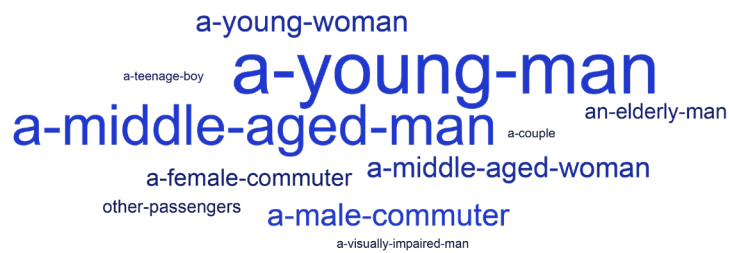
Figure 17: Word cloud of the identities of the CB practitioners (Author)
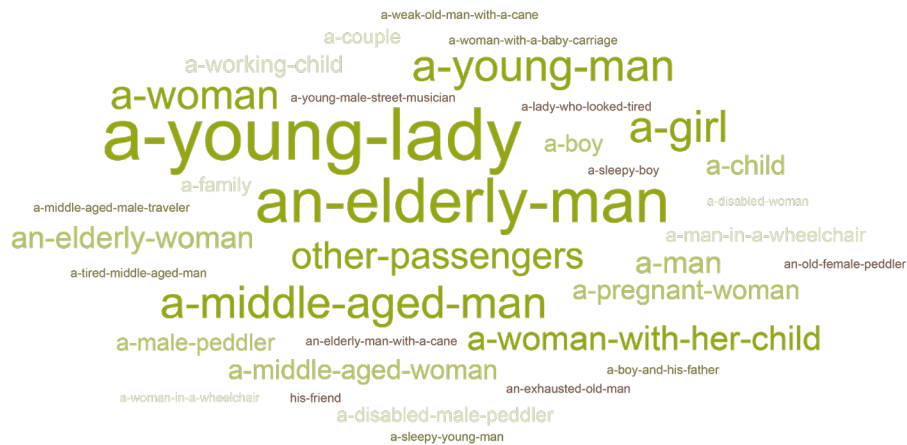
Figure 18: Word cloud of the identities of the CB targets (Author)

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1   Word cloud is an image composed of words used in a particular text, in which the size of each word indicates its frequency or importance (Koráb et al., 2022).
2   For the word cloud generator to recognize the entries that consist of multiple words as a single entry, the spaces between such entries were replaced with dashes. For example, "A young man" turned into "A-young-man".
3   For the numerical frequencies of these entries (i.e., the identities of CB practitioners and targets), please see Appendices D and E.

An overall analysis of these two word clouds reveals that the identity groups of recipients of CB are more extensive than those of the practitioners of CB. This suggests that while specific groups of individuals engage in CB, significantly larger groups of individuals are the recipients of such behaviors.

CB practitioners

"Young Men" and "Middle-aged Men", by accounting for almost 60% of the total practitioners, are the two most frequent groups of CB practitioners. Specifically, "Young Men" with 48 and "Middle-aged Men" with 34 times (out of 136). The third largest group, identified as "Male Commuters (without age reference)", had 13 recorded instances. These frequencies suggest that male individuals, particularly those in the young demographic, are the dominant groups in practicing citizenship behavior in the Tehran subway system.

CB targets

The largest two groups of recipients were "Young Ladies" and "Elderly Men", collectively accounting for almost 25% of the total recipients. Specifically, "Young Ladies" received CB 17 times, and "Elderly Men" received CB 14 times (out of 132). The third largest group, "Middle-aged Men", received CB 10 times. It is noteworthy that these groups encompass both male and female individuals, as opposed to the groups of CB practitioners.

CBs (the acts of citizenship behavior)

For the third element of OCBs, i.e, the act of "citizenship behavior," the 132 instances of CBs were categorized based on the type of action. The table below presents the five most frequently observed forms of OCBs and their respective frequencies. As shown, the CBs of "offering a seat" and "offering standing space" are the most frequent forms of CB.

Table 2: The five most frequently observed forms of CBs and their respective frequencies (Author)

Form of Citizenship Behavior	Frequency (total=132)	Percentage
Offering a seat	34	25.7
Offering standing space	18	13.6
Helping someone with a physical need	17	12.8
Helping with wayfinding	9	6.8
Buying things from a peddler	9	6.8
Other	45	34

If combined, the CBs of "offering a seat" and "offering standing space" account for almost 40 percent of the total OCBs.

A prevalent aspect concerning the actions of CBs is that almost all of these behaviors are directed to a specific rider, indicating that the CB practitioners identify someone as "in need of assistance" and direct their behavior towards them.

Revision

Drawing upon the research question (i.e., in what ways do people practice—or refrain from—citizenship behavior within subway cars?), the three components of the OCBs form the structure of the thematic map; and theme and sub-themes are structured accordingly.

- CB practitioners
    - Physically abled riders (young and middle-aged male)
    - Situationally privileged riders (taking the train in earlier stations)
- CB targets
    - Individuals in need of physical help (mostly elderly, disabled, women with children)
    - Individuals in need of social support (mostly lone young women)

- CBs
  - Directed CBs towards riders who are in need of some form of assistance (mostly physical)

Analysis of the "Citizenship Behavior Awareness" questionnaire responses

As stated in the data gathering section, to maintain internal validity in research, a questionnaire containing questions about participants' opinions on citizenship behavior, its relation to inclusivity, and potential behaviors in the real world was presented to them after they provided their subway trip log, to avoid influencing their observation and diary-keeping.

Participants' response to their awareness of the phenomenon of "commuters in crowded cities who live or work beyond the first few stations of a subway line often have difficulty finding a seat during their commute due to the limited space and seats being already occupied by those who boarded at earlier stations" shows that a majority of them (84.6%) have thought about the phenomenon, while a minority (15.4%) have not. This suggests that the issue of overcrowding and lack of seating on the subway is a common concern among commuters in crowded cities (Figure 19).

Have you ever thought of this phenomenon?
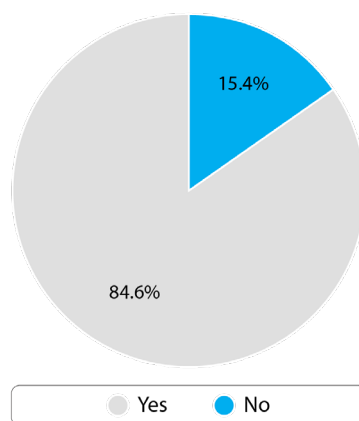
Figure 19: Percentage of participants who have considered the phenomenon. (Author)

The question of whether the "privatization of public space" on subways is considered exclusionary behavior elicited a significant response from participants, with 75% viewing it as such. This perception reflects a belief that early subway catchers are impeding access to public space and leaving no seats for others. A minority of participants (16.7%) responded negatively, perceiving the phenomenon as normal or not exclusionary, while 8.3% gave other responses that warrant further analysis. These findings suggest that the privatization of public space on subways may have implications for social inclusion and equity, emphasizing the need for more investigation and consideration of this issue (Figure 20).

Do you consider this kind of 'privatization of public space' as an exclusionary behavior?

8.3%

16.7%

75%

Yes   No   Other
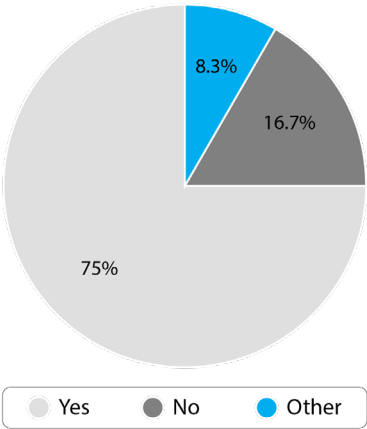
Figure 20: Participants' exclusionary view of "public space privatization." (Author)

Thinking in terms of mental models[1], the 3rd—and last question—of the questionnaire is based on the mental model of thought experiment (Brown & Fehige, 2022) to see what would be the participants' decision if they were in the hypothetical situation described in the question[2].

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1   Mental models refer to the mental representations of systems and environments that individuals develop from experience, which enable them to understand and interact with these systems and environments (Lidwell et al., 2010).

2   Question 3: Imagine yourself as someone who takes the train in its first stations and gets the

12 out of 13 participants—who returned their Subway Logs—responded to the question. Based on the responses, while it seems that the decision to give up a seat on public transportation depends on various psychosocial and socio-psychological factors, including personal comfort, level of fatigue, the needs of others, and moral obligations, most of the participants are aware of their privilege and are willing to give up their seat to someone who needs it more than they do. Two participants mentioned that they would offer their seat to someone who is elderly or disabled. Another participant mentioned that they would prefer to stand if they are not tired and would offer their seat to someone who needs it more than they do. One participant mentioned that they would evaluate the situation and offer their seat to someone who requires it more than they do.

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chance to sit (and the seats get fully occupied in the next few stations; i.e., no chance of sitting for those commuters who take the train in its midway stations). Being aware of this privilege, what would you do (i.e., towards other commuters) to consider your behavior as a "citizenship behavior"?

4

DISCUSSION OF FINDINGS
Description • Analysis • Synthesis

This chapter presents a descriptive analysis of the data with respect to the central research question. Then, it delves into a discussion of the ways in which the attitudes and behaviors of subway riders can negatively impact the inclusiveness of the interior space of subway cars, drawing on the main themes that were identified through the data analysis. Finally, the discussion considers the potential implications of such exclusionary practices on the relative popularity of public transit vis-à-vis private modes of transportation.

Findings

The objective of this study was to examine the ways in which the attitudes and behaviors of Tehran subway riders may contribute to the perpetuation of exclusionary practices towards specific groups of individuals. The primary research question posed was "In what ways, if any, commuters attitudes and behaviors are unintentionally exclusionary toward other riders?" In an effort to maintain the internal validity of the study and eliminate any potential influence on participant observations, the operational research question of "In what ways do people practice—or refrain from—citizenship behavior within subway cars?", which was a reformulated version of the main research question, was utilized as a guiding principle for participant observation and their diary-keeping.

A sample of 16 frequent riders of the Tehran subway was recruited as study participants. They were instructed via online calls to maintain a diary of the observed/practiced citizenship behaviors during their subway rides for a period of 14 days.

Findings from the subway logs

A total of 149 instances of CBs were reported by 13 participants. Instances that did not conform to the definition of CB provided to the participants were removed. After a thorough review and refinement process, 132 instances of OCBs were finalized.

The thematic analysis method was used to analyze the 132 OCBs. For this purpose, with reference to the main research question (i.e., "In what ways, if any, commuters attitudes/behaviors are unintentionally exclusionary toward other riders?"), a codebook was developed to guide the analysis. The codebook consisted of three codes, which captured the following aspects: 1) the commuter(s) exhibiting CB, 2) the recipient of the CB, and 3) the nature of the

CB itself (e.g., offering a seat to an elderly). Accordingly, each OCB was coded for the commuters who practiced the CB, the commuter who received the CB, and the act of CB.

A word cloud analysis was conducted to provide a general understanding of the demographic profiles of CB practitioners and recipients. The results indicated that the two most prominent groups among CB practitioners were "Young Men" and "Middle-aged Men", accounting for nearly 60% of the total practitioners with 48 and 34 instances respectively out of 136. The largest groups among the recipients of CB were "Young Ladies" and "Elderly Men", who comprised almost 25% of the total recipients with 17 and 14 instances respectively out of 132. It is important to note that the recipient groups included both male and female individuals, in contrast to the CB practitioners group, which was predominantly male.

 Considering that the research question was mainly concerned with the "ways" in which attitudes/behaviors of the riders may inadvertently lead to exclusion of other riders, significant emphasis was placed on the acts of CBs, as they provide insights into the attitudes of riders towards such behavior, and the nature and degree of their participation or non-participation in such acts.

In this regard, the 132 instances of CBs were categorized based on their type of action. The results indicated that the most frequently observed forms of CB were "offering a seat" (Figure 21) and "offering standing space" (Figures 22). When combined, these two forms of behavior constituted approximately 40% of the total observed instances of CB.

Findings from the "CB Awareness" questionnaire

The participants' responses to the three questions of the questionnaire revealed that most of them are aware of the phenomenon of crowded subway trains making it difficult for commuters who live or work beyond the first few

stations to find a seat. The majority also viewed the "privatization of public space" on subways as exclusionary behavior. In response to the thought experiment question, most participants were willing to give up their seat to someone who needs it more, but some would only do so if the other person deserves it more than they do. This suggests that people may not always be willing to give up their privilege unless they feel that the other person deserves it more.

Figure 21: A man offers his seat to a young lady in a crowded men's carriage (Author)

Figure 22: Men create space for the comfort of a standing woman in a crowded men's car (Author)

Upon analyzing participants' reports of the two most frequent forms of citizenship behavior, and their responses to the "Citizenship Behavior Awareness" questionnaire, two significant underlying themes were revealed.

1. A sense of ownership over public and shared space

Looking at the reports and responses of participants through a discourse analysis lens, linguistic evidence has been identified that, as per Woods' (2014)

argument, affects their behavior. Following paragraphs explore the use of this linguistic evidence and how it conveys a sense of ownership by subway riders over the shared seat and space.

The use of possessive pronouns: Out of the 34 reported instances of "offering a seat," 23 used "possessive" pronouns to refer to the seat (e.g., "A male rider offers **his/her/their** seat to a young lady in a crowded men's carriage"), while the remaining 11 instances did not use possessive language (e.g., "A rider offers **a/the** seat to a pregnant woman"). It is worth noting that two participants reported 8 out of the 11 non-possessive language instances, indicating a statistically meaningful difference.

The second most common form of CB observed, "offering standing space," displayed a similar albeit less pronounced pattern. Among the 18 reported instances, 10 utilized possessive pronouns when referring to the standing space (e.g., "A rider offered **his/her/their** standing space to a middle-aged woman"), while the remaining 8 instances used non-possessive language (e.g., "A rider offered **a/the** standing space to a young woman").

The use of performative verbs: When reporting on the act of offering a seat or space to others, participants employ a range of performative verbs, including offer, give up, accommodate, and provide. While some of these verbs, such as "give up," are neutral in terms of possession, others, such as "offer," "provide," and "accommodate," convey a certain level of ownership or responsibility over the shared seat and space.

Overall, the evidence gathered indicates that subway riders tend to develop a feeling of ownership over the seat and space they occupy, with a stronger sense of possession being associated with the seat rather than the standing space.

2. Directed citizenship behavior

Another predominant theme identified in the analysis of the reported CBs was that the practitioners engage in CB when they perceive an individual as requiring assistance. Only a minimal proportion of the 132 observed CBs deviated from this pattern, such as "engaging in a conversation with a stranger." A singular, rare instance involved an elderly man offering the seat he is sitting on to a young boy (i.e., "An old man offers his seat to a young boy") (Figure 23), and in response to the young boy's surprise, the old man mentions that "I have sat enough." The scarcity of such acts and the young boy's reaction highlight the prevalence of a need-based perspective and mental model on CB, suggesting that it is primarily directed towards individuals in need of assistance.

In summary, almost all instances of CBs were directed towards a specific individual, suggesting that the practitioners identify individuals who require assistance and act accordingly. Such CBs can be categorized as directed citizenship behavior (DCB). Additionally, participants' discussions regarding whom to offer "their" seat to indicate a sense of ownership over the seating/space. In other words, the directedness of their CBs reflects the privatization of public space.

Discussion

The findings of the study are discussed in relation to the central research question regarding the ways in which individuals engage in or abstain from citizenship behavior within subway cars. The discussion focuses on the three themes presented in the findings section, with a combined discussion of the themes of the "**need-based mental model of citizenship behavior**" and "**directed citizenship behavior**."

Ownership of shared space as privatization of public space

From a discourse analysis perspective, the participants' frequent use of possessive pronouns and performative verbs that convey a sense of ownership serve as linguistic linking devices, indicating an implicit discourse being constructed by geographically privileged riders. As language leads us to act and behave in certain ways (Woods, 2014), this unrealized discourse may inadvertently discourage these riders from engaging in CB by obscuring their agency.

Figure 23: An old man offers his seat to a young boy (Author)

The phenomenon of riders claiming ownership over the seats and spaces within the subway cars of Tehran is a demonstration of the "privatization of public space," as introduced by Lofland (1985b). However, Lofland's examination was limited to the exploration of the practices of privatization and did not delve into the exclusionary effects that result from these practices, particularly for those urbanites who are not as privileged in terms of their physical and situational attributes.

This study sheds light on the ways in which this form of privatization of public space (i.e., developing a sense of ownership over a shared place) by situationally and locationally privileged riders could be serving as the underlying cause of their exclusionary behavior towards other passengers.

Indirected citizenship behavior

Directed citizenship behavior, which is shown to be the most prominent form of CB, plays an important role in making the interior space of subway cars more welcoming. However, while well-intended, directed citizenship behavior may also have unintended consequences and may lead to stigmatization of the targeted individual. For instance, offering a seat to an elderly person may be perceived by them as an indication that they are seen as disabled or weak, which can be a source of embarrassment or shame.

Indirected citizenship behavior offers a solution to the unintended negative consequences of directed citizenship behavior, particularly in relation to the potential for stigmatization, which may lead to the exclusion of the targeted individuals. When individuals engage in indirected citizenship behavior minimizes the risk of creating a hierarchical dynamic in which some passengers are perceived as being more in need of assistance than others. By providing a more inclusive and welcoming environment for all, indirected

citizenship behavior can build social cohesion and foster a sense of shared responsibility among subway passengers.

Concluding thoughts

The conclusions derived from this case study of the Tehran subway system can be extrapolated to other subway systems in cities within Iran, as well as cities globally, that possess similar cultural value dimensions as determined by the Hofstede cultural value dimensions model (2003).

This research has recognized two themes that contribute to the undermining of inclusiveness in subway cars: 1) the unintentional privatization of public space through the claimed ownership of shared seating and space in subway cars, and 2) a need-based mental model that informs the behavior of citizens. These themes represent lesser-known aspects of the human element in subway systems. And as discussed in Chapter 2 of this research, while inclusivity is seen as a desirable value in public transportation, the opposite is true for private vehicles, which tend to prioritize exclusivity. This presents a challenge for public transportation systems, as they may struggle to compete with the increasing level of exclusiveness offered by the automotive industry. If public transportation is unable to offer a level of inclusivity that rivals that of private vehicles, it is likely that individuals will opt for personal transportation over public transit.

5

DESIGN OUTCOMES

Social dilemma • Script-based design •
Design interventions

This chapter, based on the findings, contextualizes the issue of privatization of public space as a social dilemma; introduces script-based design method and the product influence framework as the appropriate approaches and means to design effective interventions; and presents a list of design solutions.

Privatization of public space: a social dilemma

The issue identified in the findings—i.e., riders tend to have/develop a sense of ownership towards the space they occupy in the subway cars, by definition, is a social dilemma. Social dilemmas, as defined by Van Lange et al. (1992), are situations in which individuals' personal interests are in conflict with the interests of the group. One example of a social dilemma is the decision of whether to use a personal vehicle or opt for public transportation. In the context of this research, the personal concern of the riders who take the train in earlier stations is to sit/occupy the desired seat/space for the duration of their trip, yet the collective concern is equitable access to shared facilities for all passengers, regardless of their boarding station, age, gender, or vulnerability.

Social dilemmas theory is particularly relevant for designers, as it provides a framework for understanding the complex interactions between individuals and society as a whole (Tromp, 2013). Based on the principles of mediation of behavior offered by Verbeek (2011), Tromp's social implication design (SID) provides a structured approach for addressing such clashes of concerns through the design.

A Classification of Product Influence

Recognizing that products and environments can shape behavior and taking a socially-oriented perspective, this framework posits that design constitutes an intentional effort to alter behavior. Tromp et al. (2011) classify four types of product/environmental influence based on the force and salience of the influence, which demonstrates to designers how the eventual design embodies the influence (Tromp et al., 2011) (Figure 24).
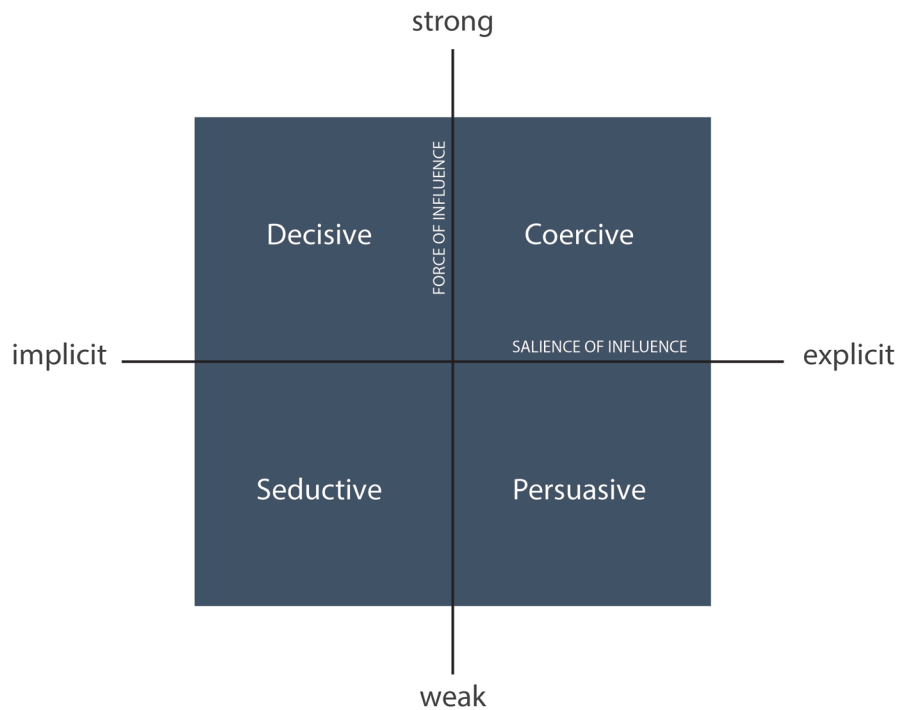
Figure 24: Four types of influence based on the dimensions of force and salience (Adapted from Tromp (2013)

A script-based design approach

The proposed framework for product influence provides a micro-level approach for designing interventions aimed at modifying behaviors in order to achieve desired social outcomes. However, it is first necessary to establish a clear understanding of the desired scenario. To accomplish this, a macro-level perspective, such as script-based design as proposed by Poelman (2008), should be employed. This approach calls for the definition of a desired scenario, followed by the design of products, environments, services, and policies to bring about the realization of that scenario.

The findings of the research indicate that there is a gap in knowledge among commuters regarding the exclusionary effects of privatizing public spaces. This lack of awareness suggests that there may be a need for education and awareness-raising efforts in order to address this issue. In this regard, the accompanying diagram illustrates the transition from current scenario to a desired scenario, where the identified gap in commuters' understanding of inadvertently exclusionary behaviors is reduced through increasing the knowledge of less-aware groups about inclusivity (Figure 25).
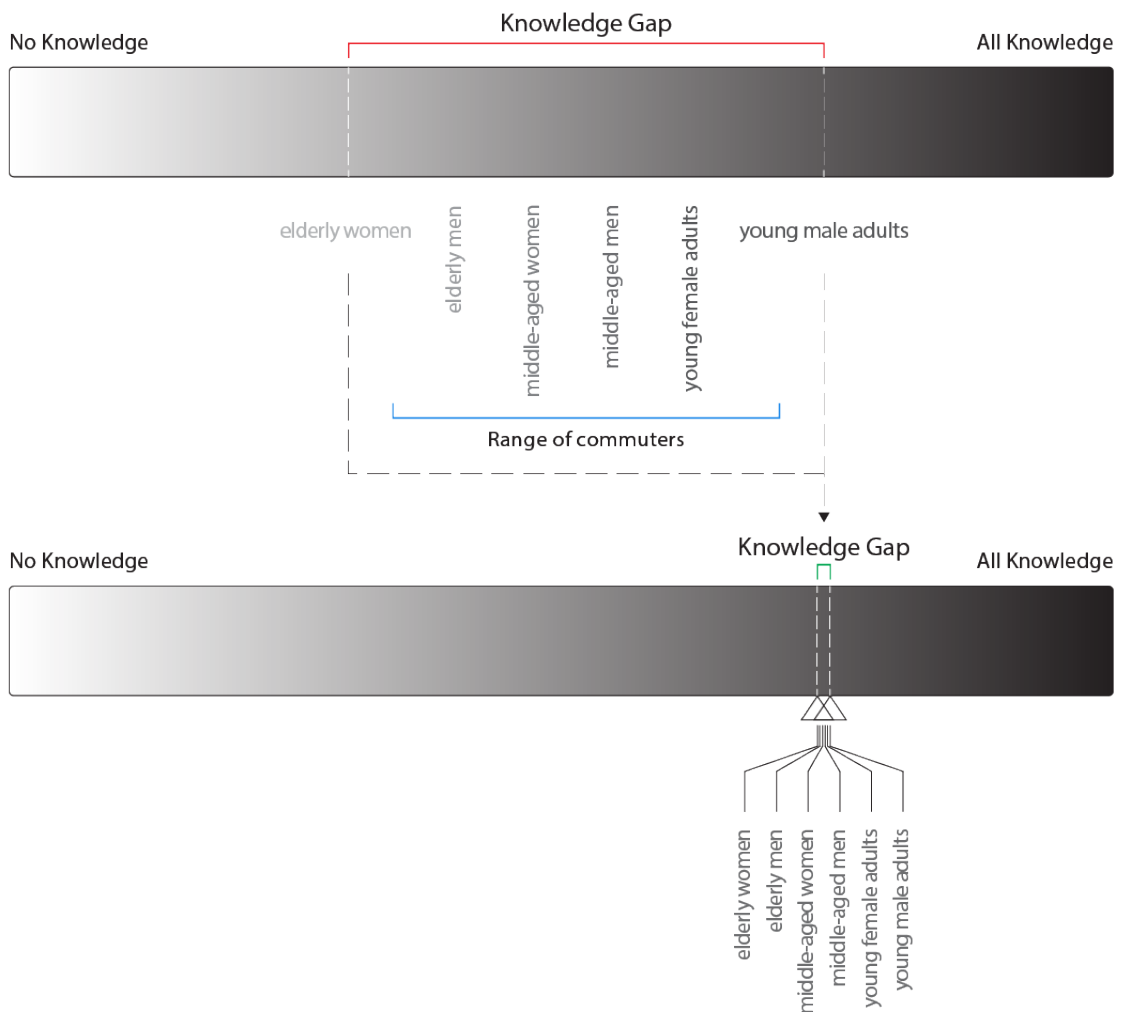
Figure 25: Design vision: a transition from the current situation to a desired scenario (Author)

Design interventions

An array of dispositional and situational factors are influencing the development of a sense of ownership towards the public space that one occupies. These factors play a crucial role in determining the likelihood of an individual giving up their seat for others. In order to design effective interventions, it is necessary to take these various factors into consideration. A list of proposed design interventions are organized in four categories of products, environments, services, and policies, which should be further developed and evaluated before implementation. With regards to the product influence, these solutions are of different levels of force and salience:

Products:

- Designing seats that have a timer or reminder to prompt passengers to consider giving up their seats after a certain time or number of stops.
- Embedding graphic cues, such as arrows or symbols, on the floor or seats to direct passengers to give up the seats to those who are standing.
- Introducing a new seating option, like a "shared seat" that can be used by multiple passengers at different times, instead of one passenger sitting for the entire trip.
- Installing small seat occupancy sensors on seats, which can be used to discreetly remind passengers via a small light or vibration when they have seated for an extended period of time.

Environment:

- Prioritizing transverse seating over longitudinal arrangement in the layout of the seats, as the priming effect (Lidwell et al., 2010) suggests that individuals facing and observing one another may act as a catalyst for increased engagement in citizenship behavior.
- Incorporating natural elements into the design of the subway car, such as

plants or water features, to create a calming and inviting atmosphere that encourages passengers to be more considerate of others.

- Improving the comfort of standing positions, which would decrease the gap between the comfort level of sitting and standing. Along with other interventions, this would increase the likelihood of being more considerate of others.

- Installing lighting that changes color or intensity to indicate the duration of time a rider has been seated.

Services:

- Developing an app that rewards passengers for behaving responsibly towards other riders—by giving up the seats after a certain time or number of stops—with discounts, free rides, or other incentives.

- Creating a buddy system where passengers can match with someone who is willing to give up the seat after a certain number of stops.

- Creating a social recognition program that publicly acknowledges passengers who engage in citizenship behaviors, such as through social media or on-board announcements.

- Creating an interactive game that educates and encourages passengers to give up the seats to others (after a certain time or number of stops).

Policies:

- Providing training for subway employees on how to approach and assist passengers with seating needs.

- Revising the current codes of conduct for subway riders to include clear guidelines for considering giving seats up to others.

- Implementing a "seat/stand" program, which encourages passengers to alternate between sitting and standing during their journey.

- Encouraging the use of voluntary measures, such as the "give up your

seat" campaign, to raise awareness about the importance of giving up seats to others.

While exclusivity is a value in private cars, the value of inclusivity is associated with public transportation. This disparity in values may be an underpinning factor that results in the behavior of privatizing public space by riders. Thus, when evaluating the effectiveness of design interventions in public transportation, it is crucial to consider their ability to shift the mental models of riders, particularly those who hold privilege, from an exclusivity-valued mentality to one that values inclusivity. This shift in mentality should be reflected in how riders perceive and utilize public transit seating and spaces, recognizing them as truly shared facilities that should be used responsibly and with consideration for other riders.

6

CONCLUSION, LIMITATIONS AND FUTURE WORK

Contributions · Limitations · Future work

This chapter includes the theoretical and practical contributions of the research, and while acknowledging the limitations, provides recommendations for further development and future research.

Contributions

The current research endeavors to make contributions to both the theoretical and practical realms of inquiry. In terms of theoretical contributions, the study:

- Expands upon existing knowledge by providing a more comprehensive understanding of the ways in which subway riders engage in citizenship behavior within the context of subway cars.
- Enhances our understanding of the unintended implications of the privatization of public space, specifically from an inclusivity perspective.
- Offers novel insights into the ways in which the locationality and spatiality of commuters intersects with other forms of identity such as gender, age, and other demographic characteristics, thereby shaping the daily commute experience of subway riders in Tehran.

In terms of practical contributions, it:

- Provides valuable information that can inform policy and decision-making related to subway systems, with the goal of promoting more inclusive and equitable services.
- Supplies designers with crucial information that can inform the design of interventions aimed at enhancing the interior spaces of subway cars, with the aim of improving the commuter experience. Furthermore, this research can be used to guide the design of other public transportation spaces, such as buses and trains, in ways that promote inclusion and equity.

Limitations and future work

The primary objective of this study was to investigate the ways in which the privatization of public space, as manifested through the actions of geographically privileged commuters, may unintentionally exclude their co-commuters from benefiting from the interior space of metro cars, which

constitutes a significant portion of their commute experience. Through this examination, the research aimed to broaden the discourse surrounding inclusivity in the design of public spaces by introducing the concept of **indirect citizenship behavior**.

Despite the significance of this research, it is important to note that it is an initial step in recognizing the nuances of exclusionary behaviors in public space. As such, the findings should be considered provisional and further research is needed to more fully understand and validate these insights.

Given the limitations of the present study, several recommendations for future work are outlined in the accompanying table.

Table 3: Limitations of the present study, and the recommendations for future work.

No.	Limitations	Recommendations for future work
1	As shown in Figure 4, this study was done in a culture with an intermediate score of 58 on the power-distance dimension.	Considering that culture, as the software of the mind (Hofstede, 2003), invisibly influences our (inter)actions, similar studies could be done on societies with different scores of cultural values, to see how cultural dimensions (such as power-distance, individualism, etc.) influences the engagement of people in citizenship behavior.
2	The site of this research was the interior space of the subway cars—which did not consider the recent experiences of the commuters (i.e., prior to their entrance to the subway cars.)	As research has shown, phenomena such as moral self-licensing (Merritt et al., 2010), priming (Bargh et al., 1996), recency effect (Turvey & Freeman, 2012), etc. have a considerable influence on one's behavior. For capturing the effects of such phenomena on the riders' in-car behavior, specific data collection methods such as the go-along method, developed by Margarethe Kusenbach (2003), could be used, for its potential to access some of the transcendent and reflexive aspects of lived experience in situ.

No.	Limitations	Recommendations for future work
3	The main data collection method for this study was on-site observation and diary-keeping by participants (and a questionnaire.)	Although naturalistic observations help overcome the limitations of other non-experimental data collection methods (e.g., issues such as action-knowledge with interviews—i.e., where, due to the social desirability effect (Paço, 2019), participants' professed or self-reported behaviors differ from their actual behavior), the use of a well-designed on-site experiment (with participants as actors) for data collection could assist with the triangulations of the findings.
		Given the increase in the use of computational explorations and computer-based experiments in investigating the dynamics of social settings (e.g., Choi & Robertson, 2019; Sotnik et al., 2022), and as previously mentioned that the research scene is a multi-agent setting and has the characteristics of a complex system, the data gathered from field study—and archival research—could be used to define a parameter space to develop an agent-based model (ABM[1]). Considering that ABMs are most useful when the agents (in this project, human individuals) are not homogeneous (Wilensky & Rand, 2015), the developed ABM will provide an opportunity to do quick computer-based experiments and gain further insight into the dynamics of the setting; because once developed, it will enable researchers to manipulate the inputs and in short amount of time get to know the effects and outcomes.

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1   Agent-based modeling is a methodology that has arisen from complex systems research, and is a new way of doing science by conducting computer-based experiments. Accordingly, agent-based models (ABMs) are a class of computational models for simulating the actions and interactions of agents of a complex system (e.g., organization, group, ecosystem, etc.)

No.	Limitations	Recommendations for future work
4	For this study, data gathered for a time span of two weeks, by 13 young adults as participants.	To enhance the reliability of the findings, more participants, from different age-ranges, could be recruited over a longer period of time for on-site observation and diary-keeping.
5	All participants of the research were frequent users of the subway.	Although frequent users could provide more examples of citizenship behavior, their overexposure to the research site might influence their likelihood of engagement in citizenship behavior. A similar study with the infrequent users as participants could provide further insights about whether the engagement in citizenship behavior is a function of frequency of use or not.
6	The main focus of the study was studying the phenomenon and identifying the problem space. As a result, the design phase of the study received comparatively less attention.	In a subsequent project, the insights gained from this study could be utilized to inform the conceptualization and implementation of design interventions that are both efficacious and appropriate.

Concluding remarks

This research aimed to examine the privatization of public space in subway cars and its resulting exclusionary effects on urban mobility. Despite initial skepticism regarding the relevance and significance of this topic, it was believed that the privatization of public space in subway cars, and in particular its resulting exclusionary effects, is a complex issue that has significant implications for equity, accessibility, and social cohesion in our cities. And, knowing that as inclusivity is regarded as a value in public transit, exclusivity is valued in private vehicles, if the level of inclusivity offered by public transportation is unable to compete with the increasing level of exclusiveness

offered by the automotive industry, it is likely that individuals will opt for personal transportation over public transport.

Through a case study of the Tehran subway system, this research sought to uncover the ways in which privatization can lead to unintentional exclusion and to identify potential strategies for addressing these issues. While it is acknowledged that this research is not exhaustive or definitive, it is hoped that it will contribute to a deeper understanding of this important topic and inspire further discussion and research on the privatization of public space and its impact on urban mobility.

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Appendices

A. Subway trip log (translated)

Date (2022)	Observed citizenship behavior (CB)[1]	Time	Identity of the actors		Crowdedness[2]					Name of the station
			The person practicing CB	The Person CB targeted at	1	2	3	4	5	
25 June					1	2	3	4	5	
26 June					1	2	3	4	5	
27 June					1	2	3	4	5	
28 June					1	2	3	4	5	
29 June					1	2	3	4	5	
30 June					1	2	3	4	5	
01 July					1	2	3	4	5	

[1] **Citizenship behavior**: refers to actions and behaviors that are not required by citizens, but practicing them could lead to better functioning of society.

[2] **Crowdedness scale**: 1) Not crowded, 2) Not too crowded, 3) Crowded, 4) Very crowded, 5) At capacity

Date (2022)	Observed citizenship behavior (CB)[1]	Time	Identity of the actors		Crowdedness[2]					Name of the station
			The person practicing CB	The Person CB targeted at	1	2	3	4	5	
02 July					1	2	3	4	5	
03 July					1	2	3	4	5	
04 July					1	2	3	4	5	
05 July					1	2	3	4	5	
06 July					1	2	3	4	5	
07 July					1	2	3	4	5	
08 July					1	2	3	4	5	

[1] **Citizenship behavior**: refers to actions and behaviors that are not required by citizens, but practicing them could lead to better functioning of society.

[2] **Crowdedness scale**: 1) Not crowded, 2) Not too crowded, 3) Crowded, 4) Very crowded, 5) At capacity

B. [Questionnaire](#) 'Citizenship behavior' awareness in the subway (translated)

'Citizenship behavior' awareness in subway

Thank you for participating in the "Subway trip log" phase of our research.

For the second—and final—section of the data collection phase, we would like to know your thoughts on a few more questions about practicing citizenship behavior in subway cars. Please read the introduction section below, and share your thoughts on the following questions (your answers will be anonymous).

We really appreciate your input!

Introduction

In crowded cities, for those citizens who are using subway for commuting between their home and workplace, and their home/workplace is located anywhere other than the proximity of first few stations of a line—or to some extent, intersection of two lines—the chances are rare that they can get a seat during their ridership (i.e., because usually there are more people than there are space and seats, and the seats are already occupied by those who have taken the train in its first stations).

Have you ever thought of this phenomenon?

○ Yes

○ No

○ Other…

Do you consider this kind of 'privatization of public space' as an exclusionary behavior?

○ Yes

○ No

○ Other…

Imagine yourself as someone who takes the train in its first stations and gets the chance to sit (and the seats get fully occupied in the next few stations; i.e., no chance of sitting for those commuters who take the train in its midway stations). Being aware of this privilege, what would you do (i.e., towards other commuters) to consider your behavior as a "citizenship behavior"?

Long answer text

Thank you for taking the time to share your thoughts.

Description (optional)

C. Observed citizenship behaviors (reported by participants via the "subway trip log" (refined and translated)

No .	Observed citizenship behavior (CB)
1	Accommodating a pregnant woman (by a young man) at the beginning of the station despite the fact that passengers are competing over seats.
2	To prevent him from falling, a young college student offered his seat to a weak old man who was walking with a cane.
3	Seeing the smiling passengers while the peddler was selling with a great sense of humor.
4	A young man accommodated a young lady when the carriage was highly crowded and invited her to the side of the entrance door of the carriage to avoid collision with other passengers.
5	Several male commuters helped the peddler after some of his items fell out of his small wheeled cart.
6	A middle-aged gentleman was asked to sit down by another middle-aged gentleman because the standing passenger's right leg was broken and it was difficult for him to stand in the subway car.
7	Two young male strangers joking with each other and supporting their football teams, despite not knowing each other.
8	To prevent him from falling, a young man held a middle-aged man's hand while the train was breaking. And of course, the passenger thanked him for this.
9	A middle-aged man patiently—and in full detail—showing the address to a young male (with a backpack) who seemed to be a visitor from another city.
10	A gentleman stood up to provide a seat for another gentleman and a lady. Due to the religious morale and the physical contact borderline between men and women, the male passenger gets up so that the couple can sit together. (i.e., there was an empty seat next to the sitting male passenger, and he got up and created two empty spaces for the couple.)
11	A young boy helping a middle-aged man to sit because he is carrying a heavy load.

No .	Observed citizenship behavior (CB)
12	Several commuters provided space in the closed-door side of the subway car to accommodate a disabled woman who was sitting on a wheelchair.
13	During alighting at the last station, a number of passengers gave way to other passengers and informed others (e.g., individuals who fell asleep) to get off the train.
14	When I arrived at the station, the subway door was closed. A mother was inside but the door was closed so quickly that her young child was left outside. A woman pacified her with kindness. Meanwhile, two men rushed towards the head of the train to tell the train official to open the door. A man took out a chocolate and gave it to the child to calm him down.
15	In the subway car, a couple with a baby in their arms were standing. A man got up and offered his seat to the wife! At the same time, the man next to him got up so that the couple with the baby in their arms could sit together.
16	A middle-aged man asked me how he should go to an address; I guided him which stop to get off and which line to take. Since I was getting off at the same station, I went with him to the entrance of that line to make sure he took the right line.
17	Two men started to fight, two other male individuals intervened and calmed them down. One of those who wanted to stop the fight said something funny and the man who was fighting laughed, the rest of the people around laughed, the fight ended in talking.
18	Two men—inside the subway car—helped a man in a wheelchair to enter the train, because there was a slight height difference between the floor of the station and that of the train.
19	An old lady got on the train and a hippie guy got up while listening to music and offered her his seat.
20	A man and his girlfriend were standing in the subway car. A seat became empty. The boy and the girl kept offering the empty seat to each other. Finally, the girl ended up sitting. A man sitting next to her got up so that the boy could sit next to his beloved.
21	Someone's child offered candy to a couple (in fact, the parents instructed her to do this).

No .	Observed citizenship behavior (CB)
22	A middle-aged man offered his seat to a young lady. The woman rejected the offer politely.
23	A young man—standing in the corner of the entrance door—offered his space to two young girls (they accepted and appreciated his offer).
24	A young man offered his seat to an exhausted old man. The man thankfully accepted the offer.
25	A young male (probably student) helped an elderly male visitor with finding his destination station on the map.
26	A young male giving directions to an elderly (observed in other instances).
27	A middle-aged male prevents the sliding doors from closing so another young male can get in.
28	A young male adult reminding an elderly passenger when he has to get off (observed in other instances).
29	A middle-aged woman offering food to a young male adult (observed in other instances).
30	A young male adult offering his seat to a woman with her child (observed in other instances).
31	An elderly man breaking up a fight between teenage boys.
32	A middle-aged man helping another middle-aged man with fallen groceries.
33	A middle-aged man reminding a young male adult that he left their bag on the subway.
34	A middle-aged woman buying things from peddler kids in need.
35	A boy sat in the only empty seat. The young male next to him gave his place to the father to sit next to his son.
36	A few ladies, who seemed concerned about a working child, asked about his living conditions and whether he was going to school or not.

No .	Observed citizenship behavior (CB)
37	In the crowded subway, a sitting middle-aged lady grabbed a standing middle-aged lady's heavy bag to hold for her.
38	People bought from the disabled peddler to support him.
39	A middle-aged woman offered her seat to a pregnant woman.
40	In the crowded subway, the young lady who was standing in the corner gave her place to another lady who looked tired so that she could lean on.
41	A middle-aged woman got a little dizzy under the pressure of the crowd; another younger woman who was standing next to her gave her a bottle of water and by warning the others, she made a little more space for her.
42	An old woman entered the subway car, looked at the seats that were all full, then stood in a corner. Seeing this scene, a young lady offered her seat to the old woman.
43	A girl got into the men's wagon, a man moved to make way for her in a corner of the wagon that had a freer space; after that the rest moved a little so that the girl could stand more safely.
44	The young woman who was sitting offered her seat to another young woman who entered the wagon with a small child in her arms.
45	The socks seller was an old woman with a tired and sad face. Another young lady bought her 4 remaining socks at once so that she could return home sooner.
46	While boarding the subway, two women moved back a little to make room for a woman with a baby carriage to enter the train faster and more easily.
47	We were waiting for the train at the station, when a teenage girl dropped her mask on the ground. A young woman gave her a new mask so that she would not use his dirty one.
48	In the crowded wagons, two young women protesting and arguing about being disrespectful and pushing each other, another middle-aged woman calmed the atmosphere by mediating and talking about how sometimes pushing others in a crowd happens unintentionally.
49	After standing for a while, the young girl leaned against the subway wall and covered her face with her hands, which showed that she was very tired. Another young woman offered her place to this girl.

No .	Observed citizenship behavior (CB)
50	A man and his pregnant wife entered the men's wagon. A young man who was sitting gave his seat to the pregnant woman.
51	A young man helped a man in a wheelchair off the subway, then got back on himself.
52	The child who was sitting next to his mother on the subway seat was bored and was grumbling. The young girl who was sitting next to them gave the child chocolate and talked to him until the destination to keep him busy.
53	Getting off and re-boarding by a young male to facilitate the exit of people who wanted to get off (observed in other instances).
54	A middle-aged man prevents the door from closing for the passengers who were going to board.
55	A young man helps a middle-aged male traveler who needed directions.
56	A young man resists the crowd to reduce pressure on an elderly man.
57	A few male passengers move towards the middle of the wagon to make room for new passengers to enter.
58	Several men made room for a tired middle-aged man who had just entered the wagon (to make him more comfortable).
59	A young man gave his space to a woman who was carrying a child.
60	The middle-aged man who was standing in the corner gave his place to a middle-aged lady who was suffering in the crowd.
61	A young gentleman stopped the wagon door from closing so that two boys who were running towards the train could board.
62	Today, like many other days, I saw that a young man gave his space to an old man; This time a young man to an old man.
63	An old man—whose job was not this, sang and told jokes to make others happy.
64	A young man reminded a male student that his bag was open and he should watch out for subway thieves.

No .	Observed citizenship behavior (CB)
65	Two young girls gave food to a peddler (child) and chatted with him.
66	A young man helped a middle-aged lady (who was carrying heavy things) to move her things.
67	A religious lady showed strong opposition to the style and code of dress of a young girl, and several ladies and gentlemen supported the young girl.
68	I myself (a young male) tried to guide a woman who seemed lost, to find her destination (the Railway station).
69	A middle-aged woman gave her seat to a standing young lady who had two children (one of them in her arms).
70	A middle-aged man bought all the goods of a disabled male peddler—and after the peddler left the wagon at the next station, the man distributed all the purchased items among the people who were on the train.
71	An old man gave his seat to a young boy with a broken leg, and held his belongings so that he could sit comfortably.
72	A young man gave his power bank to a middle-aged man whose cell phone died in the middle of his conversation.
73	A middle-aged man started singing along with a young male street musician so that people would give him more money.
74	A middle-aged man gave his cologne (from his bag) to a young man whose clothing had the smell of paint (i.e., he was a painter)—which seemingly was discomforting to other passengers.
75	An old man sitting next to me got up and offered his seat to a young man. And in response to the young man (who was trying to refuse the offer) told that I have sat enough and am not tired, you seem to be tired (he mentioned that we should provide social support for each other.)
76	A woman offered a few pieces of children's clothing—that she had bought—to the children of a couple whose clothing was worn out. Initially, the parents refused to accept, but when the children started to cry, they accepted it.
77	A few men prevented a man—who stole a woman's cell phone—from exiting the wagon, and handed him over to the police.

No .	Observed citizenship behavior (CB)
78	A young lady who had been reprimanded by a religious man for her clothing, was defending herself, when the man became aggressive. At the same time as the man's voice was raised, a middle-aged man stood in front of the man, defending the rights of the young lady, and pushed the man out of the wagon at the next station.
79	Giving the seat to a pregnant woman by my husband (a young male).
80	A middle-aged man moved and offered me (a young woman) a place to lean next to the subway so that I could stand more comfortably.
81	One of the male passengers relocated to make it possible for me (a young woman) to sit next to my husband.
82	In the women's wagon, a few women helped the peddler (woman) in holding her goods for sale.
83	Women sitting tighter in subway seats to create room for another woman to sit (i.e., six people sitting in a row of 5 seats) (observed in other instances).
84	In the men's wagon, a man standing next to the door offered the seat next to the door to a woman.
85	A middle-aged man prevents the subway door from closing by placing his foot in-between the sliding doors so that other passengers at the station have a chance to board.
86	A middle-aged man moves and provides a space for a 10-year-old child to more easily grab the bars.
87	A seated middle-aged woman takes and holds the belongings of a young lady who was standing.
88	A male student offering a seat to a woman who had a small child.
89	Giving space by a middle-aged man to a female student in a men's (mixed-gender) carriage.
90	A middle-aged woman reminded a female student that she had left her possessions behind.
91	Giving space to an elderly lady in the subway by a female student.

No .	Observed citizenship behavior (CB)
92	A middle-aged man wasn't bothered when a sleepy young man rested his head on his shoulder (observed in other instances).
93	A young man offered the area beside the door to a girl who just entered the metro car (men's metro car).
94	A middle-aged man gave his seat to a young lady who was standing in front of him in the men's metro car.
95	A young man assisted a young lady to get off a crowded men's metro car.
96	A male student helped an elderly man with a cane to get onto the train.
97	While reading his magazine, the middle-aged man allowed the guy next to him to read it too (later they started a conversation).
98	A visually impaired man was offered to have a seat by another guy.
99	A young man offered a hand to a young lady to carry her luggage.
100	A male student was helping a young man to find the right train line.
101	A young man offered another man to put his backpack on his lap.
102	A young man was offered help with the map by another man.
103	A young lady with two kids got assistance from a middle-aged man to transfer her stuff into the metro car.
104	A young guy helped a young male peddler to collect his merchandise from the floor in the men's metro car.
105	A young man offers his seat to an old man.
106	A young man supports an old man to enter the train to resist the force of the crowd upon him.
107	A teenage boy offered his seat to me (a young male).
108	A middle-aged man offered his place in the corner of the door to a girl to feel more comfortable and safe.
109	I (a young male) tried to protect an old man from the force of the crowd.
110	A middle-aged man offered his seat to a girl.

No .	Observed citizenship behavior (CB)
111	A seated adult man tried to lower his shoulder so the (strange) sleepy boy could rest his head on it.
112	A group of teenage boys tried to accommodate an old man by providing a space for him; then, satisfied with their behavior, they smiled at each other.
113	A boy tried to keep (the closing) doors open by putting his foot in-between the sliding doors, so his friend could make it to the train.
114	An old man offered his seat to an old lady.
115	A middle-aged man offered a woman to stand in the corner of the wagon next to another woman to make her feel more comfortable (to protect/ prevent her from being sexually abused.)
116	A middle-aged woman helped another woman in a wheelchair to enter the subway car.
117	A middle-aged man tried to make some space between himself and a young woman who was sitting next to him to make her feel more comfortable in a mixed-gender wagon.
118	An old woman who was sitting offered a young woman to carry her child while she was standing.
119	A young woman helped a teenage girl to find her way.
120	I (a young woman) offered to change my seat with a young woman to make a situation so two friends could sit next to each other.
121	A middle-aged woman warned a young girl to close her backpack.
122	A middle-aged woman bought bread and sweets from an old female peddler.
123	An old man needed help reading the subway map and a young male student helped him with that.
124	There was an empty seat and I (a young male student) decided to leave it for an old man.
125	A kid was crying and his mother could not calm him down. So a middle-aged man gave the kid candy.

No .	Observed citizenship behavior (CB)
126	Two middle-aged men stood and gave the seats to a family.
127	At the end of the route I (a young male student) gave my seat to an old man.
128	A male peddler and his goods fell. A few young males helped him to stand up and pick up his goods.
129	When the subway was too crowded, a few men made more space for a woman to feel more comfortable.
130	A young man stopped reading his book and got up from the subway seat to let an old man sit.
131	A young man helped an old man who was trying to get from his seat.
132	I (a young male student) stopped listening to music to give my attention to a middle-aged man who seemed to need someone to talk to (about financial hardships and political issues.)

D. Frequency of the identities of the CB practitioners (as reported in OCBs)

CB practitioner	Frequency
A young man	48
A middle-aged man	34
A male commuter	13
A young woman	12
A middle-aged woman	11
A female commuter	7
An elderly man	5
Other passengers	2
A teenage boy	1
A couple	1
A visually impaired man	1

E. Frequency of the identities of the CB targets (as reported in OCBs)

CB target	Frequency
A young lady	17
An elderly man	14
A middle-aged man	10
A young man	9
A woman	8
Other passengers	7
A woman with her child	6
A girl	6
An elderly woman	5
A pregnant woman	4
A man	4
A child	4

CB target	Frequency
A middle-aged woman	4
A male peddler	3
A working child	3
A disabled male peddler	2
A man in a wheelchair	2
A teenage girl	2
A family	2
A couple	2
A woman in a wheelchair	1
A disabled woman	1
A woman with a baby carriage	1
A boy and his father	1
A middle-aged male traveler	1
A tired middle-aged man	1
A young man	1
A sleepy young man	1
Two-men	1
A weak old man with a cane	1
An elderly man with a cane	1
A exhausted old man	1
A young boy	1
Teenage boys	1
Two boys	1
A sleepy boy	1
An old female peddler	1
A lady who looked tired	1
Two girls	1
His friend	1
A young male street musician	1

F. Recruitment Flyer (English)

Participate in Research

Privatization of Public Space: Exploring the Unintentionally
Exclusionary Aspects of the Commute Behavior of Subway Users
(Case Study: Tehran Subway)

Are you a frequent subway user?
Consider participating in a study about inclusivity in rapid public transit

Principal Investigator:
Morteza Farhoudi

Research Area:
Inclusivity in Public
Transit

What is this study about:
The goal of the study is to understand (from an inclusivity perspective)
how the geographic condition of the commuters of rapid public transit
influences their commute experience within the subway cars.

Who can participate?
Participants in the research will be regular users of Tehran Subway.

What's involved?
The study involves keeping diaries, and participating in an interview.
  • Participants will be part of the study for two weeks
  • Participants will keep diaries of their subway-related experiences for
    the duration of five days.
  • The study will run from June 25th to July 8th (2022)
  • Participants in the research will receive a $25 (CAD) gift card for their
    participation.

Contact Information:
Morteza Farhoudi
morteza.farhoudi@live.com

What are the benefits of participating?
Participation in the study will help to make the interior space of the
subway cars more equitable.

Illustration: Designed by macrovector / Freepik

F. Recruitment Flyer (Farsi)

مشارکت در پژوهش

خصوصی‌سازی فضای عمومی: بررسی جنبه‌های ناخواسته نافراگیرِ رفتارِ کاربران مترو
(مطالعه‌ی موردی: متروی تهران)

آیا معمولا از مترو برای رفت و آمد استفاده می‌کنید؟
شاید مایل باشید در پژوهشی پیرامون فراگیری در حمل و نقل سریع عمومی شرکت کنید.

پژوهشگر:
مرتضی فرهودی

حیطه‌ی پژوهش:
فراگیری در حمل و نقل عمومی

پژوهش پیرامون چیست؟
هدف پژوهش این است که از دیدگاه فراگیریٔ چگونگیِ اثرگذاری شرایط مکانیِ کاربران حمل و نقل عمومی را بر تجربه‌ی سفر آنها در واگن‌های مترو بررسی کند.

چه کسانی می‌توانند شرکت کنند؟
شرکت‌کنندگان بایستی تجربه‌ی رفت و آمد با مترو را داشته باشند.

خواسته‌ها از شرکت‌کنندگان چیست؟
- شرکت‌کنندگان تجربیات روزانه‌ی استفاده از مترو را ثبت، و در یک مصاحبه شرکت می‌کنند.
- پژوهش پنج روز به‌طول می‌انجامد.
- شرکت‌کنندگان در طول پنج روز تجربه‌های خود را از استفاده از مترو یادداشت می‌کنند و اطلاعات را با پژوهشگر به اشتراک می‌گذارند.
- پژوهش از ۴ تیرماه تا ۱۷ (۱۴۰۱) تیرماه طول خواهد کشید.
- شرکت‌کنندگانٔ بعد از تحویل اطلاعاتٔ یک کارت هدیه‌ی ۲۵دلاری (کانادا) دریافت خواهند کرد.

شرکت در پژوهش چه سودی دارد؟
مشارکت در پژوهش و فراهم کردن اطلاعات به فراگیرتر و عادلانه‌تر کردنِ فضای داخلیِ مترو کمک خواهد کرد.

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