# AN EXPLORATORY CASE STUDY OF SIGNAGE AT BEIJING DAXING AND DENVER INTERNATIONAL AIRPORTS

by

Noah Berry

A thesis submitted to the faculty of
The University of North Carolina at Charlotte
in partial fulfillment of the requirements
for the degree of Master of Arts in
English

Charlotte

2022

Approved by:

_____
Dr. Gregory Wickliff

_____
Dr. Pilar Blitvich

_____
Dr. Rebecca Roeder

# ABSTRACT

NOAH BERRY. An exploratory case study of Signage at Beijing Daxing and Denver International Airports.

(Under the direction of DR. GREGORY WICKLIFF).

This thesis presents an analysis of signage inside two international airports, public linguistic spaces that should be accessible to both global visitors as well as disabled populations. International airports and their multimodal signage present a rich environment to study global hierarchies and values. The general research question that guides this exploratory case study is: how does signage at two large international airports reflect social hierarchies in these culturally diverse spaces? More specifically, an analysis is presented of the signage visible in airport walkthrough videos of Denver International and the new Beijing Daxing International airport. This thesis found that English was a dominant language on signage in both airports, and that communicative elements such as pictographs and building architecture reflected both local and international values within the spaces.

# DEDICATION

I dedicate this thesis to my mother, who has instilled in me a curious and dedicated academic mind, as well as kindly given me a lifetime of support to help me through earning my education.

TABLE OF CONTENTS

# LIST OF TABLES

# LIST OF FIGURES

# INTRODUCTION

This thesis presents an analysis of signage in two international airports, public linguistic spaces that should also be accessible to global visitors as well as to disabled populations. International airports and their signage present a rich environment to study global hierarchies and values. At a time when people around the globe are connecting and interacting with each other more than ever before through travel and distance communication, attempts to overcome linguistic and cultural differences, as well as differences in physical ability are becoming even more important. When diverse speakers meet and navigate shared spaces, cultural and linguistic hierarchies, especially regarding economic class or social traits, take shape and become visible. International signage is an important avenue for research revealing social hierarchies and providing better information access to people who may be otherwise marginalized. Signage acts as a bridge between information and action, and so is an appropriate topic of study from the point of view of both technical writing and linguistics. In the field of technical writing, texts are often presented through an objective voice or persona, although it is understood that these texts inevitably reflect the local cultural ideas from where they are produced (Dobrin, 1985, p. 240) as they seek to accommodate technology to users. Signage itself, often presented as devoid of obvious bias or cultural influence, reflects deeply held ideological societal beliefs. A close reading of these technically and linguistically diverse public spaces informs our understanding of them as sites that reflect hierarchical power relationships between cultures and people.

Signage, while seemingly a passive technology, clearly indexes the types of readers who are most welcome in a given space. Therefore, to answer questions about global power dynamics and hierarchies in international spaces where members of various cultures intersect, signage should be closely examined. For example, a small village in Germany would have little use for

signage written in both German and Vietnamese if there were not a local Vietnamese population or a frequent group of Vietnamese visitors. Conversely, if there were a large Vietnamese population and their language and signage was presented only in monolingual German, this would signify hegemony of the German language (Kraus & Grin, 2018). In multilingual public spaces, the function of a sign influences the language that is chosen to be dominantly placed. Language choices related to signage function are seen in Coupland's (2012) study that observed the Welsh language presence on signage that enforced ideals of nationalism and heritage in Wales, while dominant or monolingual English was present on most other signage. Signage that helps to identify these global power structures and hierarchies can be easily found in international airports, as these spaces are where people of varying cultures, linguistic backgrounds, and ability intersect daily.

This is a timely and relevant topic as inclusion and cultural sensitivity are becoming more and more important in domestic and international policies. Identity categories are growing in sophistication and individuals are increasingly identifying with less orthodox or binary groups. As one of many examples, gender is becoming a more multifaceted identity category; this allows individuals to identify among a spectrum of gender options, as opposed to simply identifying through the binary categories of man or woman. This research seeks to deepen our understanding of how to be more inclusive through written and visual communication. Technical and functional signs are a part of our everyday lives. By examining the ideas portrayed by these signs we can understand how they contribute to and reflect societal values and beliefs. Research within the field of technical communication can help uncover societal hierarchies and beliefs through the design and use of signage.

Technical writing, or writing that accommodates technology to users, includes functional signage, and is typically presented in an objective voice to minimize the subjectivity of the authors. However, there are no neutral technologies or statements. All writing and design reflect the values of the authors. The process of normalization leads readers to internalize and embrace particular societal values as true. Palmeri (2006) defines normalization as attempts at "legitimating and subjugating knowledges, examining and controlling workplace practices, forming subjectivities, and marking bodies as normal or deviant" (p. 49). When writing is "technical" it carries with it an authority that may present subjects as normal or abnormal; however, readers' perceptions shift from culture to culture and across time. For instance, bodies can be marked as normal or deviant in a variety of ways that can reflect one's culture, ability, or linguistic background. To mark others as deviant, one may think of the physical authority needing to be present in that space. Nevertheless, signs enact power over others due to their perceived objectivity, projecting a tone of presumed authority to maintain power within communities or between globally intersecting communities. In spaces like public airports, readers who ignore or disobey signs may quickly encounter armed police acting as agents of the state.

One paradigm that can be used to critique signage and the cultural ideals it reflects is the field of *linguistic landscapes* put forward by Landry and Bourhis (1997). In their words, "the most basic informational function of the linguistic landscape is that it serves as a distinctive marker of the geographical territory inhabited by a given language community … the linguistic landscape serves to inform in-group and out-group members of the linguistic characteristics, territorial limits, and language boundaries of the region which they have entered" (p. 25). Consideration of linguistic landscapes, in the sense of an international space in a culturally

diverse area such as an airport, raises an important question: *who is included within the in-groups or out-groups*? Signage helps to normalize these in and out-groups. Linguistic landscapes, consequently, act as geographical markers of how norms are reflected in particular spaces.

Linguistic landscape studies show us how spaces operate through the means of social codes and norms that users can habitually navigate. Blommaert (2013) states, "whenever we use space, we orient towards the messages we pick up in such spaces and we act accordingly. We identify a space as a no-go area, and area where someone like us is not welcome, and we avoid entering it" (p. 59). The theory of linguistic landscapes presents signs as carriers of sets of social norms and values while the inhabitants of these spaces are defined by their interaction with the space.

Airports as linguistic landscapes then become interesting territory, as a multitude of cultures and people cycle through airports daily, receiving explicit or implicit signals from a space which shows where they are (un)welcome. Airports have been studied as spaces where technical communication studies and linguistics intersect, as linguistic landscapes. They have been analyzed for the sociocultural purpose of signage (Cunningham & King, 2021), for tendency of signage to be unwelcoming to native speakers of out-group dialects (Heinrich, 2010), and to reveal how multilingual signage reflects linguistic hierarchies among an international audience (Woo & Riget, 2020). The concepts of normalization and the field of linguistic landscapes present airports as appropriate spaces for study in both linguistics and technical communication, especially through multimodal approaches.

For airport signage to be effective, it is important for it to make use of multimodal elements like pictograms. As globalization occurs throughout the world and spaces become more linguistically diverse, pictograms and icons are increasingly used (Ben-Rafael & Ben-Rafael,

2018). Research has been done on the use of pictograms within airports and their effectiveness, Renema (2018) states, “Pictograms can be recognized faster than words and are easier to read at a distance than written text, but this only applies when they are understood correctly” (p. 8). Pictograms draw upon “the eye/brain connection as a mechanical process that every human being shares, making perception universal” (Winn, 2014, p. 456). The design of pictographs frequently shifts; in the Olympics, a space which accommodates global cultures and language speakers, pictographs have changed to be more realistic and complex in order to be most effective and aesthetically pleasing (Kim, 2012, p. 2). Pictographic elements are seldom discussed in linguistic landscape studies on airports but should be studied as key semiotic resources that can create a welcoming landscape for those who do not belong to the local culture. Giving appropriate attention to studies on signage and visual communication through pictographs allows a multimodal landscape analysis of airports.

# CHAPTER 1: LITERATURE REVIEW

Critiquing and optimizing writing in international spaces has become ever more consequential in a globalized world. Technical communication is a field focused on practical use and applications of how writing "accommodates technology to the user" (Dobrin, 2004, p. 118) to make the world more accessible for all audiences. It emphasizes direct information with special attention to how audiences interact with text and image and make use of information, but difficulties may arise in international environments where audiences of different languages, cultures, and abilities intersect. To achieve the goal of studying signs that attempt to include all users who interact in international spaces like airport terminals, this research adopts a mixed methods approach which analyzes signs qualitatively and quantitatively with applications from the fields of both linguistics and technical communication. This thesis categorizes and critiques airport signage in international contexts. To analyze international airport signage, studies of linguistic landscapes, technical communication, and critical discourse analysis have proven useful.

International airports serve as a valuable point of research for technical communication due to the number and range of types of readers, the need for quick, clear, and effective information, and the technical and legal complexity of large spaces and air travel. For technical communicators, audience, purpose, and medium are central. They must ask, who is my audience, where are they from, and what is their culture? What languages do they speak and read? Are they differently abled? Once questions about audience are answered, authors must determine how to get the users of the airport to understand the purpose and meaning of a written or graphic sign as quickly as possible so that they may effectively navigate the airport terminals and reach their flights in a timely manner. Users expect signage to accomplish their informational and

orientational needs, and designers must understand the users' cultural and linguistic background in order to achieve this (Bonfanti, 2013, p. 316).

*Linguistic landscapes*

The term linguistic landscape was coined by Landry and Bourhis (1997), and was originally described as how the

> . . . language of public road signs, advertising billboards, street names, place names, commercial shop signs, and public signs on government buildings combines to form the linguistic landscape of a given territory, region, or urban agglomeration. (p. 25)

Moving well beyond a simple description of the text present on signs, linguistic landscape scholarship describes sets of social norms and values for the inhabitants of these spaces, as defined by these norms and their interactions with them. For example, Blommaert (2013) articulates this as the study of the relationships between "Signs, practices, people" (p. 59), emphasizing that spaces operate via social codes and norms that users within that space must navigate.

Since Landry and Bourhis' foundational study, the field has evolved into one that adopts a range of theoretical and methodological approaches, often including consideration of multimodal elements of signage. Pennycook (2018) urges researchers to consider more than just a quantitative analysis of signs, but to also qualitatively assess how a sign is read in its context and what meaning this can provide. Pennycook uses the term *semiotic assemblages* in order to properly refer to linguistic landscapes, writing, "Semiotic assemblages refer to the ways in which linguistic resources, everyday space, and social space are intertwined" (p. 82). Pennycook's (2018) research, in conjunction with Blommaert's (2013), argues that in order to analyze a

linguistic landscape, signs should be analyzed carefully within their environment and context. Linguistic landscape studies are often done in conjunction with other fields or theoretical frameworks, Coupland (2012) for example, analyzes the linguistic landscape of Wales, but does so with the use of "frame analysis perspective" (p. 4), to determine the function and purpose of signs. Frames help determine the underlying purpose of a sign, such as frames of "parallel-text bilingualism" (p. 9), frames of "national resistance" (p. 13), and frames of "Welsh exoticism" (p. 15) as examples.

The study of linguistic landscapes helps researchers to identify power structures and cultural ideals that are present in spaces. This is especially evident in minority languages that are used in a decorative manner, such as Māori being used on tourism-related signage in a New Zealand airport (Cunningham & King, 2021), or Welsh being used to make areas appear more culturally authentic in Wales (Coupland, 2012). A language being used decoratively, to provide some largely fictive ethos of multiculturalism, rather than functionally, reveals cultural beliefs regarding the "usefulness" of a language.

Genuinely bilingual spaces can often display language hierarchies as well, which is seen in Cenoz and Gorter (2008), where the multilingual city of Friesland, Netherlands typically favored use of the dominant language of Dutch, rather than the subjugated local language of Frisian. The design and layout of a sign can reveal these hierarchies, as shown by Woo and Riget (2020) where designers placed dominant languages at the top of signs, with the less privileged languages appearing at the bottom. In their study of an Okinawan airport, Heinrich (2010) similarly observed language hierarchies, finding that there were many local Japanese dialects that were entirely absent from the airport while English was prevalent for international travelers.

As our understanding of linguistic landscapes has evolved, so has the definition of what constitutes a sign, as evidenced by studies done over the last ten years. Blommaert (2013) defines signs in three ways. The first category is permanent signs, which include, "road signs, shop signs, permanent publicity signs, landmarks, graffiti" (p. 62). The second category is event-related signs, "posters announcing an event; temporary shop signs (announcing e.g. discounts or particular products); for-rent or for-sale signs; smaller announcements displayed publicly (e.g. announcing absence, change of address etc.)" (p. 62). The third category represents noise, defined as "inscriptions that landed in the neighborhood 'by accident': people leaving readable objects behind; cars and vans stationed for a brief while. Blommaert's definition of signs is valuable, and Blommaert's category of permanent signage is relevant to the definition of signs within this thesis. Subsequent linguistic landscape studies within this literature review are compared to Blommaert's frame of reference.

Cunningham and King (2021) distinguish between eight major types of signs. These types include, "Street signs, advertising signs, warning notices and prohibitions, building names, informative signs (directions, hours of opening), commemorative plaques, objects (postbox, police call box), graffiti. (pp. 99-100). Cunningham and King's research overlaps with Blommaert's as they invoke similar definitions of signs. Interestingly, Cunningham and King's eight major types of signage fit neatly into Blommaert's first category of "Permanent Signs." Cunningham and King, however, do not discuss signage in the sense that Blommaert does, as they do not consider analyzing Blommaert's signs of "Event related signs" or "noise." This thesis similarly focuses only on permanent signage, as airports are typically kept clean and devoid of "noise" signs with support from paid janitors. Cunningham and King also discuss "educational signage", arguing that signs "are informative, but also have an element of

educational or sociocultural purpose" (p. 100). *Educational signage* pertains to signage that attempts to meet the information needs of users to navigate the airport, learn the appropriate cultural norms and behaviors of an airport, to educate the visitors on the local environment and tourism opportunities in the city, or to emphasize the airport's branding and to bolster its city's image. Educational signage can relate to all categories within this thesis's coding, relating to function, language, and pictographs.

Airports are a common center of research for linguistic landscape researchers. Cunningham & King's (2021) study analyzed the linguistic landscape of a New Zealand airport and its educational signage, Woo and Riget (2020) researched a Malaysian airport and the hierarchical languages on signs, and Heinrich (2010) observed the likely intentional absence of native Japanese dialects within an Okinawan airport. All linguistic landscape studies have noted the importance of observing hierarchical languages on airport signage, the language politics of the airport's local region, and the linguistic audiences who traverse the airport.

Woo and Riget (2020) divide airport signage into two categories. They begin with defining aviation technical signage, designed to help authorities control aircraft and crew traffic, and tourism airport signage, intended to assist pedestrians in navigating the airport and locating their gate. The authors further divide airport signage into three types. Type one signage relates to directions. Type two pertains to informational signage, signs that "provide details about airport services and functions such as public restrooms, passenger waiting areas, and retail stores for dining and shopping and so on" (p. 5). Type three refers to identification, regulatory, and advertising signage. These signs mark the locations of airport functions, legally regulated spaces such as non-smoking and customs areas, and advertisements for retail spaces that produce revenue for the airport. Woo and Riget also argue that tourism signage usually includes

pictograms, arrows, and words based on a global navigation system to ensure that the signs are accessible to audiences with a wide range of linguistic, mental, and physical abilities. As was the case with Cunningham and King, Woo and Riget's signage definition also fits neatly into Blommaert's category of "Permanent Signs" (Blommaert, 2013, p. 63).

The definitions of signs as presented by Blommaert (2013), Cunningham and King (2021), and Woo and Riget (2020) provide a useful approach for studying and defining airport signage. Blommaert's (2013) definition of permanent signage and Cunningham and King's definition of educational signage will be used as key concepts throughout this thesis. Categorizing the varying types of permanent signage is useful for quantitative analysis in this study, while determining a sign's educational purpose is useful for a qualitative analysis of the meaning and rhetorical importance of a sign within an airport. Pennycook's study regarding multimodality is also central because it highlights the importance of analyzing a sign in its social context and creates a concept broad enough to include graphical elements present on the sign such as pictographs and arrows.

Linguistic landscape study within airports has been done, but these studies often lack multimodal analysis of pictograms, or consideration of pictograms at all. This thesis seeks to view and analyze the linguistic landscape of international airports with a critical and multimodal lens.

*Signage studies and visual technical communication*

Signage studies within technical communication represent an avenue of research that appears to overlap heavily with the field of linguistic landscapes. While the linguistic landscape studies above are beneficial to this study, most fail to create a space to critique pictographs and

other graphical elements of signs, including color. Woo and Riget's (2020) work, for example, discusses hierarchies of language and their speakers, but overlooks pictographs, potentially ignoring the users who may benefit from the accessibility represented by the universal design principles that include pictographs. A multimodal analysis of pictographs may not be necessary for all linguistic landscape studies, but airports are spaces that rely on effective pictographic communication due to their broad audiences who range in linguistic background and ability. Analysis of airports' linguistic landscapes demands attention to pictographs and multimodal elements.

In their study, Renema (2018) does include both varieties of written English and pictograms on signs in airports. Renema argues, "Pictograms can be recognized faster than words and are easier to read at a distance than written text, but this only applies when they are understood correctly" (p. 8). Winn (2014) also discusses how pictographs on a sign may be most effective, arguing that they present a potential solution to the challenge of communicating information to diverse audiences of varying linguistic and social backgrounds. Winn conducts a case study by analyzing signage in a Western North Carolinian homeless shelter. This study shows how visual signage and universal design principles can ensure increased accessibility.

Winn further discusses how to optimize pictographic signage by discussing ISOTYPE, the International System of Typographic Picture Education. It refers to the work of Neurath (1936), a philosopher of science, who developed a sociological system of pictorial icons. These icons were designed with universal understanding in mind. In Winn's summary, Neurath "saw the eye/brain connection as a mechanical process that every human being shares, making perception universal" (Winn, 2014, p. 456). To be considered universal, Winn argues that every symbol must follow a set of rules, including being "Self-explanatory (no ambiguity); simple

(minimal detail); generic (representative of all cars and telephones, for example); flat (no perspective) or isometric, like children's drawings where you see 'an object from all sides at once;' and uniform (all identically sized regardless of the object's actual size)" (Winn, 2014, p. 456). Winn combines the framework of ISOTYPE with Charles Sanders Peirce's semiotic study to analyze the effectiveness of signage used in a homeless shelter which is designed to reach a large and diverse audience. Peirce's study of semiotics, especially regarding "unlimited semiosis," is relevant in an airport study of signage. In this approach to semiosis, the signified is not stable and predictable, but shifts with context. Airport pictographs have a large range of audiences who can interpret pictographs differently based on their experiences, culture, and language (Mangion, 2011, pp. 41-42). This framework is useful for analyzing pictographs and is used in this thesis to critique the effectiveness and accessibility of airport pictographic signage.

The effectiveness of pictographs also greatly relies on the user's discourse community. Kostelnick and Hasset (2003) invoke the term *visual language communities* (p. 27) as a parallel to discourse communities. Users, they argue, are familiar with series of enculturated codes, either by the process of being socialized into them, or by means of formal training. These enculturated codes can be present in the form of simple pictographs such as a universal warning icons, like the circle and the line, but can also be as advanced as the symbolic diagrams an engineer may use to draft plans for a building. Designers of signs must be acutely aware of their audience's visual language community, or else users may encounter dangerous or even fatal issues, as discussed by Shaw and Goff (2016) in their study regarding misleading tsunami signage. Ineffective signage can lead to physical injury and can also harmfully contribute to the marginalization of groups by the process of *normalization* as presented by Palmeri (2006). In this sense, normalization refers to "legitimating and subjugating knowledges, examining and controlling workplace practices,

forming subjectivities, and marking bodies as normal or deviant" (p. 49). When writing is "technical" it carries with it an authority to normalize discourse, employing imperative voice instructions and factual descriptions. Consequently, it is easy to see how technical communication can be misperceived by users as objective and true (Dobrin, p. 237, 1985).

Visual communication can be portrayed through pictographs and interpreted by users based on their community norms, but visual communication can further apply to the architecture and design of buildings themselves (Kostelnick & Hasset, 2003). Kostelnick and Hasset discuss how architecture can act as a form of communication that delivers messages to the users who inhabit the space, stating that, "Readers may not understand ancient Greek, medieval French, or contemporary American English, but they can readily interpret the Parthenon, Chartres, or the Sears Tower" (p. 10). Pictographs and the visual communication that they comprise should be analyzed in conjunction with linguistic landscape studies to broaden the perspective of research about signs and accessibility, especially for the disabled.

*Disability studies within technical communication*

Disability studies is an important topic within technical communication studies. When creating technical works and considering one's audience, the accessibility of a text should always be considered. Technical communicator academics commonly urge for the inclusion of disability studies within technical communication research to better accommodate audiences of varying abilities (James, 2015, p. 110). Journals in technical communication have published special issues devoted to discussions of the links between technical communication and disability studies, with works ranging from discussing universal design (Stevens, 2020), linguistic construction of ableism (Palmeri, 2006), and critiques of medical ableist-biased technical communication (Wilson, 2009). One of the newest journals to appear in the field is *Rhetoric of*

*Health and Medicine* co-founded by Lisa Meloncon, who also edited *Rhetorical Accessibility: At the Intersection of Technical Communication and Disability Studies* (2014). Technical communication academics argue, "both TPC and disability studies have many of the same theoretical grounds, in that they both focus on the construction of disability through the social makeup of disability identity" (Stevens, 2020, p. 99). Boyle and Rivers (2016), for example, analyze "versions of access" for technical texts to investigate the meaning of accessibility in both physical and digital contexts. They begin their article with an anecdote of attempting to make an online journal text accessible. After some work, they determined that instead of using alt-text to make their writing accessible, it proved much more effective to record the journal in a spoken manner in several separate files to match the sections and structure of the article. Then, this recorded journal article was accompanied by "intro and outro music," making it another *version* of the original article. Boyle and Rivers describe this by stating, "Another 'version' of the article emerged. The key word we stumbled upon here was version" (p. 30). The researchers determined that they had found something significant for accessibility, as they had realized the effectiveness of creating different multimedia versions of texts, not just an article with accessible traits tacked onto it. This anecdote is crucial to their story, as they extend the theory of *versions* of accessibility to physical environments as well.

Technical communication incorporates disability studies to critique the common perception of technical works as objective. Walwema (2021) discusses deceptive objectivity within technical communication, stating,

> Furthermore, we now know that objective technical communication can function to regulate actions that perpetuate inequities that range from housing to finance to maternal health to voting, and to hiring in higher education. We see too that as TPC has grappled

> with diversity, and embraced the scholarship of international and intercultural communication and translingual literacies, its reach has grown even wider. So too have the lenses through which we study these phenomena. (p. 102)

Technical communication can contribute to inequalities as well as reinforce images of groups, such as the image of disabled populations. Researchers have discussed technical communication's ability to dehumanize or further marginalize disabled peoples, including Oswal (2018) who discusses how workplaces, classrooms, and pedagogies can be "disabling," and how discourse can perpetuate harmful ideologies about disabled people that may dehumanize them or negatively associate them with their disability. Oswal writes,

> On the heels of the signing of the ADA in July 1990, in the September issue of The Bulletin of the Association for Business Communication, Lisa Tyler (1990) published the results of a study on the use of labels for describing disabled people that either dehumanized them or equated the disability with the person. (p. 4)

Lastly, Palmeri (2006) argues that creating texts for universal design should be a participatory act, including the users, those for whom the text is designed. Palmeri stresses that to avoid ableist biases that are ultimately enforced through normalization, technical communicators should seek to include disability studies in their research. This work is greatly important to include when considering how to optimize signage that is accessible for all. Analysis within this thesis seeks to reveal ableist biases and writing that perpetuate normalization.

*Critical discourse analysis*

Critical discourse studies (CD) is an approach in applied linguistics used to critique power within social structures. In Lin's (2014) overview of the field, the author writes that CD

"is interested in uncovering ways in which social structures of inequality are produced in and through language and discourse, it contributes to the critical turn in applied linguistics by offering theoretical and methodological resources for critical inquiry" (p. 214). CD is a field that benefits from an interdisciplinary and multimodal approach. As van Dijk (1993) states, "social inequality, at the societal level, is not simply or always reproduced by individual (speech) acts such as commands" (p. 250). Studies in this field can also benefit from an examination of the "style, rhetoric, or meaning of texts" (p. 250). Dominance and power can present itself in many ways, meaning that a close analysis of textual and multimodal elements can identify hidden power structures that may oppress marginalized groups.

As dynamics of power are manifest in a variety of ways, this field encourages an interdisciplinary approach. Critical discourse studies are beneficial to a linguistic landscape study that analyzes power structures and helps to identify social injustice. Signage studies and an analysis of visual communication, even extending to the architecture of buildings as earlier discussed with Kostelnick and Hasset (2003), can help to identify structures of power and dominance over others. Buildings themselves can act as components of a visual communication system that can define relations of power between the users of a space and the designers or owners of the space. Fairclough (1995) also argues for an analysis of non-linguistic features, arguing, "texts do not need to be linguistic at all; any cultural artefact – a picture, a building, a piece of music can be seen as a text" (p. 4). Lin (2014) discusses how, in the same way, multimodality is essential for CD, writing that

> The analytical focus should thus be on how language, as continuously changing systems of semiotic resources, among other semiotic systems of resources (e.g., multimodalities), are recruited and utilized for constructing racial, gender, social, sexual, and other cultural

> categories that legitimate and perpetuate inequalities (e.g., policies, institutions) in society. (p. 215)

When considering "semiotic systems" and multimodalities, elements on signs such as pictographs, text size, layout, and color, prove to be important elements to analyze in order to identify power structures and hierarchies within international airports. Lastly, Wodak and Meyer (2008) state the goals of CDA, "CDA is characterized by the common interests in de-mystifying ideologies and power through the systematic and reproduceable investigation of semiotic data (written, spoken or visual)." (p. 3).

CD studies are not often used as methodological framework for linguistic landscape studies, but it has been done and CD studies theorists urge more research to be done in this direction, with Seargant and Giaxoglou (2019) stating, "To date, however, theorizing that is directed specifically at the relationship between linguistic landscape studies and discourse studies has been slight" (p. 1). One notable study is Ku (2020) who uses critical discourse analysis to uncover social structures and dynamics of power present on signage in Taiwan same-sex marriage protests. Ku arrived at the conclusion that the signage at the protest revealed hierarchies within the LGBT community regarding differing ideologies within the LGBT community and heteronormative communities (p. 171).

International airports are a rich environment in which thousands of visitors from varying cultures, different levels of physical ability, and linguistic backgrounds intersect daily, trying to achieve the common goal of successfully navigating the terminals and efficiently boarding their flights. Research from the field of linguistic landscapes can be applied to address questions about accessibility or cultural views towards ability in these public spaces. An example of this could be extending Winn's (2014) work on pictographic signs to address how the disabled are depicted on

such signs, and if those representations contribute to the process of normalization discussed by Palmeri (2006). While the fields of linguistic landscapes and research in technical communication represent separate approaches to the study of signs, they can be combined to produce valuable analysis in the context of international airports. The literature of these research areas demonstrates how designers can create signs that communicate information effectively while being culturally appropriate.

This research seeks to explore in and out-groups and how they are constructed multimodally to mirror social hierarchies. The general research question that guides this exploratory case study is: how does signage at two large international airports reflect social hierarchies in these culturally diverse public spaces? Specifically, an analysis is presented of the signage visible in airport walkthrough videos of Denver International and the new Beijing Daxing International airports. Key questions framing this analysis include:

1. Who is the intended audience of a sign within these airports?
2. Are there design elements on these signs that reflect a social order?
3. What multimodal elements are commonly used on airport signage?

This study employs approaches from technical communication studies and linguistics to demonstrate how airport signage functions in multimodally rich spaces for thousands of users daily. This research extends previous research from both fields and serves as a point of reference for those in the future studying the intersection of linguistic landscapes and technical communication studies. This study extends previous research by looking at linguistic landscapes of airports with a multimodal lens and seeks to urge technical communicators to thoughtfully consider how their signage constructs in and out-groups with the awareness of linguistic landscape theory.

# CHAPTER 2: METHODOLOGY

This study seeks to compare and contrast dynamics of power and cultural values as expressed through airport signage, with an eye to identifying common patterns as well as differences. To do this, two international airports were selected, Beijing Daxing International Airport, and Denver International Airport. These airports were chosen due to their geographical size, with Denver International Airport being the second largest international airport in the world in square footage and Beijing Daxing International Airport being the sixth largest in the same regard. Both airports are also important hubs for both international and domestic flights, and rank among the 50 busiest airports in the world. In addition, these airports were selected due to the amount of visual data available. High quality videos of airport walkthroughs were freely accessible online, and that allowed for the recording and coding of their signage. These airports are previously unexplored in linguistic landscape or technical communication research and they are a point of focus due to their widely diverse audiences in regard to cultural access, linguistic background, and physical access and ability. Denver and Beijing's airports highlight two strongly contrasting cultures that reflect dynamics of power and othering as they exist globally.

Due to financial and physical constraints, I was unable to physically visit these airports. Instead, signage was documented through a close reading of two airport walkthrough videos. The Beijing Daxing Airport signage was collected by closely observing ten minutes of video from Walk East's (2021) YouTube video, "Walking In Beijing Daxing Airport | China's $17 Billion Mega Airport | 4K HDR | 北京大兴国际机场". For its part, the Denver International Airport signage was collected by similarly observing ten minutes of Brian Ozment's (2021) YouTube video, "Denver Airport - Check in and Walkthrough." Care was taken to sample a similar

number of signs from each airport video. 104 signs were recorded in 10 minutes of Beijing Daxing Video, and 112 signs were recorded in 10 minutes of Denver Airport video, resulting in 216 signs coded total.

*Theoretical framework*

Theoretical frameworks for this coding are taken from linguistic landscape studies (Blommaert, 2013; Cunningham & King, 2021; Heinrich, 2010; Woo & Riget, 2020) and technical communication studies (Kostelnick & Hasset 2003; Palmeri 2006). The above language categories were influenced by Woo and Riget's study of a Malaysian airport, regarding hierarchical languages by text's placement on a sign, and Rosendal (2009), who describes the ordering of languages on signs as "a ranking of languages," which highlight the importance of a language within its space (p. 19). Categories of function were influenced by Blommaert's (2013) linguistic landscape study and categorization of permanent signage. Lastly, for individual qualitative analysis of signs, Cunningham & King's (2021) definition of educational signage was used to describe a sign's underlying cultural purpose within the airports, as well as Nikolaou (2017), who describes languages on signs which are used symbolically to appear "cosmopolitan, sophisticated, and trendy" (p. 160).

*Procedure of analysis*

Observations from these videos were carefully noted and entered into a spreadsheet that then was coded for categories reflecting both language and function. The language categories are shown below in Tables 1, 2, and 3. Signs were qualitatively analyzed as well, with attention to multimodal features such as text layout, semiotic pictographs, and color. Pictographs were coded based on the text they accompany. A pictograph that stands alone on a sign was coded as

pictograph only (PO), or as pictographic with language (PWL) if the pictograph accompanied text (see Table 3). The following chapter will provide background and analysis on Denver International Airport, utilizing the procedure of analysis detailed above.

**Table 1: Language Codes**

| Abbreviation | Full name |
|---|---|
| **MLE** | Monolingual English |
| **MLM** | Monolingual Mandarin |
| **MTL** | Multilingual |
| **MOE** | Mandarin over English |
| **EOM** | English over Mandarin |
| **EPME** | Equally privileged Mandarin and English |
| **EOS** | English over Spanish |

**Table 2: Function Codes**

| Abbreviation | Full name |
|---|---|
| **PRO** | Prohibition signage |
| **EDS** | Emergency directional signage |
| **COV** | COVID-19 signage |
| **NED** | Non-emergency directional signage |
| **WARN** | Warning signage |
| **INF** | Informational signage |
| **MR** | Map-related signage |
| **MAIN** | Maintenance signage |
| **ACC** | Accessibility signage |
| **FAC** | Facilities signage |
| **WASTE** | Waste signage |
| **C** | Commercial signage |
| **A** | Advertising signage |

**Table 3: Pictograph Codes**

| Abbreviation | Full name |
|---|---|
| **PO** | Pictograph only |
| **PWL** | Pictographic with language |

# CHAPTER 3: DENVER INTERNATIONAL AIRPORT

## *Denver International Airport background*

Denver International airport (DEN), while landlocked and in the middle of the U.S., is the third busiest airport in the world and accommodates roughly 70 million passengers per year, three million of whom are international travelers. This equates to almost 8700 international visitors daily. The airport is described as "the primary economic engine for the state of Colorado," as it generates $33.5 billion for the region per year. This airport was constructed in 1995, and cost $4.9 billion to build and has since grown into being a global hub for tourism (FlyDenver). Again, Denver International Airport is the third busiest airport in the U.S., as well as being the eighth busiest globally (World Airport Codes). This airport is the largest in the U.S. by land area, and the third largest in the world behind King Fahd Airport and Beijing Daxing International Airport. Denver's large airport accommodates a total of 89 gates and six runways, allowing for a high traffic of annual visitors (World Atlas).

Given the large number of domestic visitors that DEN receives each year, it is reasonable to assume that this airport seeks to act as a representative of local values and culture to its large audience of visitors. Further, considering that an international airport of this scope will be receiving international passengers from various cultures, language backgrounds, and abilities, the signage within the airport should also seek to acknowledge these audiences and to guide them effectively to their destination. Tables 4, 5, and 6 below present distributional analyses of sign type, language use, and whether a pictograph appears with or without language on the same sign. Among other observations, these tables provide insight into the degree to which various audiences are represented within the airport, a topic that is taken up in the following section.

*Results and discussion*

**Table 4: Distribution of Signs in Denver Airport by Function (N = 112).**

Please note: Total includes pictograph-only signs.

| Function of sign | n | % |
|---|---|---|
| **Non-emergency directional** | 36 | 32.1% |
| **Informational** | 20 | 17.9% |
| **COVID-19** | 11 | 9.8% |
| **Commercial** | 10 | 8.9% |
| **Advertising** | 9 | 8% |
| **Accessibility** | 6 | 5.4% |
| **Emergency** | 6 | 5.4% |
| **Waste** | 5 | 4.5% |
| **Prohibition** | 4 | 3.6% |
| **Warning** | 4 | 3.6% |
| **Facilities** | 1 | 0.9% |
| **Maintenance** | 0 | 0% |
| **Map-related** | 0 | 0% |

**Table 5: Distribution of Signs in Denver Airport by Language (N = 107).**

Please note: Total does not include pictograph-only signs

| Language | n | % |
|---|---|---|
| **Monolingual English** | 104 | 97.2% |
| **English over Spanish** | 2 | 1.9% |
| **Multilingual** | 1 | 0.9% |

**Table 6: Distribution of Pictographic signs in Denver Airport Based on Whether Written Language is Used on the Sign or Not (N = 58)**

| With or w/o language | n | % |
|---|---|---|
| **Pictographic with language** | 53 | 91.4% |
| **Pictograph only** | 5 | 8.6% |

*Tourism signage in Denver*

Results of the analysis show that Denver's signage and airport facilities are designed to cater to domestic tourists, as is reflected by the tourist-aimed signage throughout the space. The parking lots are named after nearby Colorado mountain ranges, such as, "Pike's Peak Lot" and "Mt. Elbert Lot." There are restaurants and bars titled things such as, "Red Rocks Bar." Furthermore, the advertisements throughout the airport hint at Denver's geography and mountain-related tourist activities. From the designer's viewpoint, the ideal user of this airport appears to be one who is an outdoor sport enthusiast.

**Fig. 1 Advertisement with mountains (Ozment, 2021)**

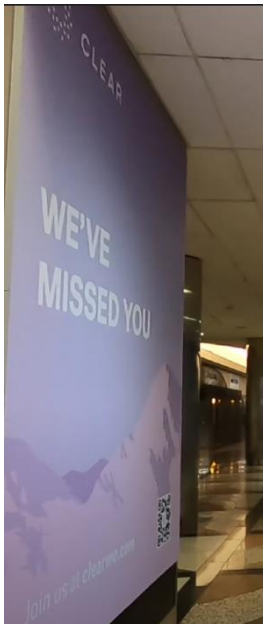



**Fig. 2 Parking shuttles named after local mountains (Ozment, 2021)**


Although outdoor tourism is the apparent theme of the airport, Denver welcomes roughly 70 million visitors yearly, so users include many types of people besides hikers, outdoor adventurers, and outdoor sport enthusiasts. The purpose of signage within an airport is also to encourage visitors to spend money within the airport. Cunningham and King describe this by stating, “Internationally, smaller-sized airports (those with 5 to 14.99 million passengers per year), such as both the Christchurch and Auckland Airports, typically market themselves by linking themselves with tourism-related content.” (p.100). Interestingly, it is observed that the Denver airport design is fundamentally based on references to tourism, although it is one of the largest airports in the world.

Knowing the expansive size of Denver’s airport and its adventure-like theme leads to the conclusion that the airport’s signage is meant to inform and persuade the users that the Denver Airport, and the Western U.S., will be a destination for outdoor adventure which suggests an outdoor adventure frame for Denver’s signage. Naming parking lots and restaurants after local

attractions, such as the “Pikes Peak Shuttle Parking,” “Mt. Elbert Shuttle Parking,” and “Red Rocks Bar” (FlyDenver) serves the purpose of not only educating users of the airport on how the Denver Airport officials would like users to interact with the space, but also functions to point at where to go and how to navigate the region.

Aside from educating users on the local adventure opportunities in Denver, much signage fits into the non-emergency directional category. This type of signage is aimed at helping users navigate the airport, whether to their gates or through security checkpoints. Non-emergency directional signage in the Denver airport was exclusively in English and pictographic, despite the importance of these signs to everyone navigating the airport.

*Multilingualism in Denver*

In order to contextualize this subsection, it is important to consider that while Denver International Airport is one of the busiest airports in the world as mentioned above, only 3-4% of the travelers who pass through are international, while the rest are domestic (FlyDenver Operations and Traffic, December 2021).

Nonetheless, Denver’s signage targets English speakers, with roughly 97% of the observed signs written in monolingual English. The remaining signs were either written in English and Spanish, with English being the dominant text over Spanish, or were pictograph-only signs. In this respect, is it important to take into consideration that roughly 12 percent of Denver residents are Spanish speakers, meaning that even a significant percentage of local Denver travelers could make use of signage being written in a language other than English (Colorado Health Institute).

Spanish appeared only in the context of a reoccurring COVID-19 sign, indicating that Spanish was likely not prevalent in the airport prior to the pandemic. The severity of the pandemic and attempts to prevent cases from spreading or entering the airport from the international community may have been the impetus to add other languages onto English signage.

The other case of a language other than English being present on signage was a glass wall decoration on an international visitors' center. This decorative sign presented the phrase "Welcome" in eight languages, including, Mandarin, English, Arabic, German, Japanese, Spanish, Korean, and French. Unlike the paper COVID-19 signage, this decoration was painted onto the glass of the international visitors' center, indicating its permanent acknowledgement of foreign language speakers who may be present in Denver International Airport. This wall somewhat parallels the largest spoken languages in the world, with the exemption of Hindi, Bengali, and Russian (CIA Factbook).

Therefore, although the COVID-19 signs are in Spanish, which points to the management of Denver Airport acknowledging the presence of a significant number of Spanish speakers, it is in the extreme context of a temporary and sudden dire global emergency. Similarly, the international visitors' center wall displays several languages, but its function is primarily decorative and thus can be interpreted as a small gesture towards foreign language speakers. Importantly, the permanent usage of languages other than English is fundamentally absent from the airport for functional or directional purposes. Relatedly, Cunningham and King (2021) discuss how Māori is present in the New Zealand airport, but Māori is not there for the purposes of assisting native speakers and is instead decorative rather than functional to educate the users of the airport on its cultural value, as is also seen in other linguistic landscape studies, such as

Coupland (2012) who observed Welsh used for its cultural and decorative value. In Denver, the glass wall decoration could be interpreted similarly, as it simply shows that the airport acknowledges its international visitors to some degree. Overall, however, the Denver Airport is overwhelmingly monolingual despite being a high-traffic airport that sees roughly 8,700 international travelers per day.

**Fig. 3 International visitors center (Ozment, 2021)**


**Fig. 4 Temporary COVID-19 Signage (Ozment, 2021)**


*Pictographs*

As mentioned, while there are only 3-4% international visitors in the Denver International Airport, it is important that those who may not speak English still have effective means to navigate the airport. This is achieved by having a high volume and percentage of pictographic signage. In the present analysis, pictographic signage was classified in the context of non-commercial signage, falling into the category of permanent signage of Blommaert (2013), excluding store signs and advertisements. Pictographic signage fits into the frame of universally-

needed information signage, and was considered for the functional categories of Prohibition, Emergency, COVID-19, Non-emergency directional, Warning, Informational, Map-Related, Maintenance, Waste, Accessibility, and Facilities signage. Signage was accompanied by a pictograph, or was pictograph-only, in 52% of signs in the Denver airport. Pictograms are described as extremely effective and recognizable faster than words, but only in contexts where they are easily understood (Renema, 2018, p. 8). Research has been done to determine the effectiveness of pictograms and to determine how they may best be understood by audiences who are from varying cultures, literacy levels, or ability. For instance, Winn (2014) discusses how pictographic signage must be non-ambiguous, simple, generic, flat or isometric, and uniform (p. 456). Signage in Denver commonly achieves these aims. As seen below, each item listed on the non-emergency directional sign is written in English and is accompanied by a pictograph that describes the writing. The prohibitionary non-smoking sign is free of text, and the pictograph speaks for itself without words, likely being effective for varying language speakers.

**Fig. 5 No Smoking Sign**
**(Ozment, 2021)**

**Fig. 6 Non-Emergency Directional Sign**
**(Ozment, 2021)**


The no smoking sign was seen on the in-airport metro, accompanied by a variety of other signs that were solely pictographic. The sign follows Winn's (2014) criteria for effectiveness, as the image of a smoking cigarette is non-ambiguous, simple, flat, and uniform. Further, the image

of a smoking cigarette is modified by means of a large red circle with a line through it, indicating that the metro is a non-smoking area. Cunningham and King (2021) define this type of sign as educational, as it instructs and educates users of the airport regarding the cultural rule that smoking is not allowed and is disrespectful indoors, although it may be allowed and culturally acceptable in other airports (p. 102).

The non-emergency directional sign similarly follows Winn's (2014) criteria for effective signage, as the logos depict human subjects, places of importance, and planes in a flat, isometric, and uniform way. Interestingly, the sign opts for using no language when describing the escalator, indicating confidence that language is not needed to describe certain points of importance throughout the airport, and that a pictograph is sufficient. The sign indicates to a large audience, regardless of their language, that an escalator is ahead with the use of an escalator pictograph and drawing of a human subject. The pictographs that were accompanied by no text could be accounted for by Kostelnick and Hasset's (2003) discussion regarding widely understood visual conventions. Arrows, as well as circles with lines through them, prove to be visual conventions that have a broad visual discourse community and can be easily interpreted without written language.

Although the no-smoking symbol and escalator pictograph are effectively presented without words, the "Check-in" and "South Security" pictographs are not nearly as self-explanatory. The "Check-in" symbol follows the guidelines of flat and simple, but the image itself could mean a multitude of things depending on the placement and interpretation of the sign.

Winn's study dealt with the identical pictograph as seen above. In their study, Winn discusses how the "Check-in" symbol is intended to be universal and is "standard for a ticket purchase in a travelling context" (p. 462). Although the symbol is intended to be universal, Winn

noted that it is still easily misunderstood as the pictograph is not as representative or intuitive as others. To remedy this, Winn states that the check-in pictograph should be placed in intuitive places, such as near the check-in or ticket purchase area, as the location of the sign's placement greatly affects how useful the sign will be. In Figure 6 above, the "Check-in" text is accompanied by "Southwest", and "Alaska", which may increase the sign's effectiveness as non-English speakers will still be familiar with the name and logo of the airline upon which they intend to travel, thus leading them to follow the sign and to check in for their flight. The "South Security" pictograph, however, is much less universally recognized. The pictograph depicts a security officer, as indicated by a police uniform which is not culturally universal, checking a suitcase. The depiction of the suitcase is also quite easy to misinterpret, as it similarly looks like a laptop computer.

As can be seen from this analysis, Denver airport is largely monolingual, but this is compensated for by extremely frequent and sometimes effective pictographs. The effectiveness of these pictographs is increased by their physical placement within the airport in proximity to an activity matching the purpose of the sign.

*Accessibility*

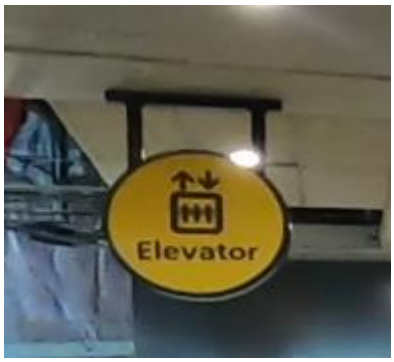
Accessibility signage within the Denver airport was sparse. Out of 112 signs, only 5% featured any form of instruction regarding accessible facilities within an area. In general, accessibility signage seems to be present in the form of the universally recognized blue wheelchair symbol, or through features which improve accessibility such as elevators.

**Fig. 7 Handicap accessible kiosk**

**(Ozment, 2021)**

**Fig. 8 Elevator sign**

**(Ozment, 2021)**




The digital kiosk itself, as seen above in Figure 7, is not a sign within the parameters of this study, but the blue wheelchair logo which is placed upon it modifies the meaning of the kiosk and indicates that it is for use for the disabled. Most accessibility signage is created by attaching the universal handicap logo to an object, thus modifying the object's meaning and designating it as useful for disabled individuals. The elevator sign (Figure 8) takes a different approach than the other accessibility signage throughout the airport. Instead of using a wheelchair symbol to modify the meaning of an object or to directly indicate that it is of for use by disabled users, the elevator instead presents itself as an option for those who need it regarding their movement capabilities or preferences. These two signs demonstrate a difference of approach for accessibility signage. One approach is to directly indicate accessibility with a bright blue wheelchair logo, and the other is to present the option of accessibility by providing the accessible option and to not directly associate it with the universal blue wheelchair symbol.

*Summary of Denver International Airport*

Denver International Airport is a largely monolingual linguistic landscape that uses pictographs as means for accessibility for linguistically diverse audiences. Although Denver

International Airport is landlocked and in the middle of the U.S., there are still thousands of international travelers who circulate through the airport each day, and the Spanish speaking population of the Denver region represents 10% of that population. Instead of catering towards foreign language speakers through written language, Denver opts to serve these audiences with pictographs as a means to maintain an English language American-focused image of a tourist destination and an outdoor adventure-themed airport. The following chapter will take a similar approach, giving background and analysis on the Beijing Daxing International Airport.

# CHAPTER 4: BEIJING DAXING INTERNATIONAL AIRPORT

## *Beijing Daxing International Airport background*

The new Beijing Daxing International Airport is located near the political capital of China, only roughly 30 miles away from Tiananmen Square. The airport occupies 10 square miles of land and is the largest airport terminal by land area in the world. The airport cost an estimated $17 billion to construct, while the projects in its periphery have drawn investments of up to $46.2 billion. Despite the COVID pandemic and a restriction to primarily domestic flights in 2020, the airport saw 16 million passengers (CAAC). The airport is estimated to be able to accommodate up to 45 million passengers per year, with this number increasing to 100 million in the coming years. Beijing Daxing airport currently has four runways and 79 airport gates. As the airport sees new additions, it will grow to host seven runways in total and be able to serve an estimated number of 620,000 flights annually (Daxing PKX; Airport Technology).

There are few English language statistics regarding Beijing Daxing airport, but it is interesting to note that Beijing Daxing's website states that the airport is already one of the largest airports in the world.  Data from the Civil Aviation Administration of China shows that the airport hosted 16 million passengers in 2020, highlighting its role as a gateway to China. As the newest major airport in the capital, it bolsters the image of the country as expansive and extravagant, technologically up-to-date, and financially lavish.

**Table 7: Types and Number of Functional Signs in Beijing Daxing Airport. (N = 102)**

Please note: Total includes pictograph-only signs

| **Function of sign** | **n** | **%** |
|---|---|---|
| **Commercial** | 28 | 26.9% |
| **Non-emergency directional** | 20 | 19.2% |
| **Warning** | 11 | 10.6% |
| **Emergency** | 10 | 9.6% |
| **Informational** | 8 | 7.7% |
| **Advertising** | 7 | 6.7% |
| **Accessibility** | 3 | 2.9% |
| **COVID-19** | 3 | 2.9% |
| **Facilities** | 3 | 2.9% |
| **Prohibition** | 3 | 2.9% |
| **Waste** | 3 | 2.9% |
| **Map-related** | 2 | 1.9% |
| **Maintenance** | 1 | 0.9% |

**Table 8: Types and Number of Written Language Signs in Beijing Daxing Airport (N = 85).**

Please note: Total does not include pictograph-only signs

| Language | n | % |
|---|---|---|
| **Monolingual Mandarin** | 27 | 31.8% |
| **Mandarin over English** | 21 | 24.7% |
| **Multilingual** | 13 | 15.3% |
| **English over Mandarin** | 10 | 11.8% |
| **Equal Mandarin and English** | 9 | 10.6% |
| **Monolingual English** | 5 | 5.9% |

**Table 9: Pictographs and language accompaniment in Beijing Daxing Airport (N = 51).**

| With or w/o language | n | % |
|---|---|---|
| **Pictograph with language** | 32 | 62.7% |
| **Pictograph only** | 19 | 37.3% |

*Beijing Daxing Airport extravagance*

Many airports provide interesting art, architecture, and luxury shopping (e.g., the Gucci, Louis Vuitton, Moncler brands), but as with many things intended for a global audience in China, the massive Beijing Daxing airport takes such opulence a step further and is designed to showcase national wealth and status. This suggests that the target audience for the signage in this airport are those who are wealthy and who are financially capable of international travel. Figures 9 and 10 illustrate the level of thought that has gone into the airport's design and architecture, and many of the following pictures display the luxury shopping available to airport users as well.

**Fig. 9: Beijing Daxing Architecture**

**(Walk East, 2021)**

**Fig. 10: Daxing Aerial View**

**(Culver & Jiang, 2019)**

The categories of language, functionality, and pictographs shown in Tables 7-9 help to develop a better picture of what values are reflected within the airport. Cunningham and King (2021) discuss educational signage as functioning to inform and instruct users about the cultural dynamics and rules of a space. Along these lines, the signage of Beijing Daxing airport is meant to educate and inform users of both the cultural rules of the airport as well as convey a certain image of Beijing and China as a country. Many of the airport's advertisements are large and colorful, making them hard to miss and enhancing the aesthetic appeal of the airport. Figure 11 shows an ad for a luxury Chinese brand. China's commercial and decorative signage throughout the airport fits into a luxury frame and seeks to cater to a high-end audience. The airport's emphasis on luxury and high-end shopping as reflected by its architecture and 26.9% of signs being for commercial purposes shows that, in terms of Cunningham and King's definition of educational signage, Beijing Daxing's airport seeks to persuade viewers that Beijing, and China as a nation, is a lavish, luxurious, and powerful destination. While Beijing seeks to project a luxurious image, it is important to note that this is not unique to Chinese airports, many airports throughout the world would likely yield the same results of high percentages of commercial signage. However, the results here still demonstrate concrete evidence of Beijing Daxing's

airport attempt to appear higher class by including a majority of high-end shopping outlets and extravagant modern architecture in the airport.

**Fig. 11: Colorful luxury advertisement**

**(Walk East, 2021)**


*Multilingualism in Beijing Daxing Airport*

The largest category of signage regarding functionality in this airport was non-emergency directional signage. This category of functionality was commonly paired with language choices that privileged both Mandarin and English. Internationally, English slightly edges out Mandarin regarding its number of overall language speakers, including second language and lingua franca speakers, with English spoken by 16.5% globally, and Mandarin spoken by 14.6% globally (CIA). The coding of language on signage distinguished between the many uses and combinations of Mandarin and English on signage. These categories consisted of monolingual Mandarin (31.8%), Mandarin over English (24.7%), English over Mandarin (11.8%), equally privileged Mandarin and English (10.6%), and monolingual English (5.9%). The majority of non-emergency directional signage consisted of Mandarin over English or occasionally English over Mandarin, while never being monolingual Mandarin. In roughly 11% of the signs, English and Mandarin were equally privileged and side-by-side, showing that neither language was

dominant. Much of the non-emergency directional signage alternated between having Mandarin on the left of the sign and English on the right, then having English on the left of the sign and Mandarin to the right. Other linguistic landscape studies have shown similar instances of language hierarchies existing due to language positioning on a sign, (Hult, 2013; Woo & Riget 2020), the appearance of evenly privileged languages is illustrated in Figures 12 and 13. Non-emergency directional signage was often paired with pictographic elements, with the pictographic element residing on the side of the sign that presented Mandarin text.

**Fig. 12: Mandarin over English signage**

**(Walk East, 2021)**


**Fig. 13: English over Mandarin signage**

**(Walk East, 2021)**


Regarding hierarchical language placement, Woo and Riget (2020) discuss airport signage in a Malaysian airport and the different languages that are displayed on signage. They discussed how signage, in a top-to-bottom and left-to-right fashion would often demonstrate which language was deemed most important in a space. Here, these rules appear to be mixed as both English and Mandarin are often considered equally important on non-emergency directional signage, which is arguably the most important category of signage of function within an airport. Due to the language positioning being commonly shifted across different non-emergency directional signs, it is difficult to tell which language is privileged in the airport. Mandarin was

more prevalent than English throughout the airport, but in the most functionally important category of signage, both Mandarin and English exchanged positions of dominance. This equal privileging of language may even be reflected in the recent surge of Western investments into China, which shows that China seeks to align with Western values economically (Huang & Lardy, 2022).

*Commodification and Exclusion of Languages*

English and Mandarin both exchanged dominant sign positioning on non-emergency directional signage, but these were by far the most prevalent languages throughout the airport. Other languages such as French and Italian were sometimes found in the airport, but this was rather in the context of advertising for designer brand stores such as Gucci and Louis Vuitton. Functionally, the only languages that were privileged in this airport are English and Mandarin. Other European languages were present throughout the airport, but they are for the commercial purposes of bolstering the airport's image of prestige and commodifying the language for its cultural value (Leeman & Modan, 2009), as opposed to benefitting the native language speakers to assist them in navigating the airport. Here, similar to Cunningham and King's observation regarding Māori being used as a decorative language to influence tourists, non-English European languages are being used within Beijing Daxing in order to create an image of extravagance, an ethos of sophistication, with little real utility for the speakers of these languages.

Similarly, Heinrich (2010) discusses the linguistic landscape of a Japanese airport and notes that although there are many languages present in the Japanese area, there are few languages present on signs for functional purposes. This conclusion is likely true for Beijing Daxing as well. For a large international airport situated in the middle of Asia, Chinese and English are likely not the only languages spoken by the visitors. Knowing that Beijing Daxing

operated with 16 million passengers in 2020, it is apparent that many of these travelers were international as well, despite COVID-19 pandemic restrictions on travel. Other languages, especially Asian languages such as Korean or Japanese, were excluded throughout the airport even in the context of commercial and advertisement signage which was often even used for foreign brands. The exclusion of these neighboring languages shows that Beijing Daxing airport seeks to project an image that excludes neighboring countries of Asia and instead associates more strongly with the Western countries of Europe and America by their use of European languages and American English. Mandarin and English speakers are most heavily included, while European languages are moderately included by the presence of designer stores. This displays the hegemony of the Chinese language over other Asian languages and Chinese dialects, demonstrating that the Chinese government seeks to align with languages that provide them with a higher perceived social status and value.

*Pictographs in Beijing Daxing Airport*

Though Woo and Riget (2020) and Heinrich (2010) discuss language choices in airports, they do not recognize pictographs as language or even as compliments to language. Within the Beijing Daxing airport, almost every non-emergency directional sign is also accompanied by a multitude of pictographs. These pictographs are designed for either providing arrows to indicate where a user can find the listed destinations on a sign, or to describe the destinations on the sign in a graphic manner. As seen below, non-emergency directional signage follows a formula of including an arrow, pictograph, Mandarin, and English for each item listed on the sign. Considering Winn's (2014) study on effective pictographs, the next two images are moderately effective by her criteria as explained below.

The pictographs in Figures 14 and 15 represent the airport's courtyard, gates, and the bathrooms. The courtyard logo consists of a flat, minimally detailed picture of a bench, tree, and sun. These items, in conjunction, indicate something that looks like an outdoor park, showing users of the sign that this pictograph and arrow will lead them towards an outdoor area to rest. This pictograph, however, depicts the tree as much larger than the bench, and this creates a logo which becomes visually cluttered and difficult to grasp quickly, breaking Winn's criteria of uniformity. The gate logo consists of an airplane lifting off, indicating to users that this is where to go in order to meet their plane's departure. This pictograph adheres more to the standards of an effective pictograph, as it is self-explanatory, simple, generic, flat, and uniform. Due to the pictograph's positioning next to the gate numbers, "C44-C53", a user who does not speak English or Mandarin would be able to associate the text on their boarding pass with this sign in order to follow the arrows to their terminal. Lastly, there are two pictographs accompanied by the text, "Toilet." First, there is the universal handicap symbol, second, there is a universal background sign with pink and blue subjects to indicate gender. The blue wheelchair icon is universally recognized and follows Winn's guidelines, as does the bathroom sign. The blue wheelchair pictograph and bathroom symbol are used in combination to indicate that the bathroom is accessible to handicapped users. Here, two well-known pictographs are combined to create and modify the meaning of one another.

Pictographs on the non-emergency directional signage are also made easier to understand by their repetition of the same pictographs in different areas of the airport. The bathroom sign, courtyard sign, and gate symbol are all seen later in the airport on standalone signs, which helps users associate them with specific locations and to verify that they have correctly followed the pictographic arrows.

**Fig. 14: Pictographic non-emergency directional signage (Walk East, 2021)**


**Fig. 15: Bathroom Sign (Walk East, 2021)**

While Beijing Daxing's language choices appear to be exclusionary to those who are not Mandarin or English speakers, pictographic signage is present for signage that reflects urgency. Signs that encourage users to participate in the airport's high-end shopping and associate with Beijing's luxury fit into the luxury frame. Signs that are necessary for passengers' navigation and safety fit into the universally-needed information frame. On most emergency and accessibility signage, pictographs appear that clearly mark a facility's purpose without the use of written text. For emergency fire escapes, there is simple use of pictographs and color to mark where to go in the event of a fire or emergency. Also, for the disabled at the airport, there is signage that marks where to find a wheelchair or where to locate handicap-accessible facilities in the airport. Signage that functions for emergencies or for accessibility purposes, which are legal requirements in an airport, can be read without the use of spoken or written language. The pictographic nature of these signs may point towards the airport's lack of language accessibility in other areas, as the signage with most legal importance is visual and thus made the most accessible while the remainder of the signage in the airport, which fulfills other functions, appears more exclusionary and difficult to read for non-English and Mandarin audiences.

**Fig. 16: Pictographic fire escape sign**

**(Walk East, 2021)**

**Fig. 17: Wheelchair pick-up signage**

**(Walk East, 2021)**

All forms of signage, excluding commercial signage and advertisements, typically included pictographs to help users navigate the airport. The pictographs were most effective on emergency directional signage, as the pictographs typically were able to stand alone without text accompanying them.

*Summary of Beijing Daxing Airport*

Beijing Daxing is often multilingual in its signage but is most functionally accessible for Mandarin and English speakers. European languages are often present, but their languages are commodified for their perceived status to enhance through advertising the already extravagantly designed airport. This airport seeks to align with Western values with a heavy presence of English on signage, while also attempting to strengthen the positive image of China's capital city with a clean, sleekly designed, and massive airport. The final section of this thesis compares the signage found at Beijing Daxing International airport to that at Denver International airport.

# CHAPTER 5: COMPARISONS OF SIGNS AND SPACES AND CONCLUSION

In the previous chapters of this thesis, videos of the Denver International Airport and Beijing Daxing Airport were analyzed individually to identify trends in the messages that their signage was meant to deliver, both on a basic functional level and also on a larger scale cultural level. This chapter compares and contrasts the analyses of the two sites to argue for the contrasting or similar values represented by the signage within these international airports. In addition, this chapter addresses questions regarding differences among values between countries, while also revealing similar values that may be shared internationally. In the context of international airports, many cultures and language backgrounds intersect, so language choices are revealing. Signs reflect decisions about how airport designers seek to resolve the issue of passengers with widely varying backgrounds interacting in a common space. Signs reveal which cultures and ideals are privileged or unwelcome.

Videos of Beijing Daxing airport and Denver airport were carefully observed and the signage visible in each of these airports was organized into categories of functionality, language, and pictographs. These categories can be viewed below in charts.

*Comparing functional signage*

**Table 10: Comparison of Sign Functions**

| Function | Denver Airport | | Beijing Airport | |
|---|---|---|---|---|
| | **n** | **%** | **n** | **%** |
| **Non-emergency directional** | 36 | 32.1% | 20 | 19.2% |
| **Informational** | 20 | 17.9% | 8 | 7.7% |
| **COVID-19** | 11 | 9.8% | 3 | 2.9% |
| **Commercial** | 10 | 8.9% | 28 | 26.9% |
| **Advertising** | 9 | 8% | 7 | 6.7% |
| **Accessibility** | 6 | 5.4% | 3 | 2.9% |
| **Emergency** | 6 | 5.4% | 10 | 9.6% |
| **Waste** | 5 | 4.5% | 3 | 2.9% |
| **Prohibition** | 4 | 3.6% | 3 | 2.9% |
| **Warning** | 4 | 3.6% | 11 | 10.6% |
| **Facilities** | 1 | 0.9% | 3 | 2.9% |
| **Maintenance** | 0 | 0% | 1 | 0.9% |
| **Map-related** | 0 | 0% | 2 | 1.9% |

*Comparing functional signage*

Regarding functionality, both airports had a similarly large percentage of signage related to non-emergency directional signage, which is signage that directs users of the airport to the varying locations they will need to access, such as airport gates. However, most of Beijing Daxing's signs related to commercial purposes, such as storefronts. For its part, more of Denver's signs fulfilled non-emergency directional purposes. The signage in these airports was

alike in frequency regarding most other categories, such as waste, accessibility, facilities, prohibition signage, and emergency signage. Regarding frames, both airports had frames that conveyed mandatory safety and navigation knowledge rich with descriptive pictographs to guide users. Each airport had frames which were exclusive to their own airport. Only Denver presented English-only outdoor adventure framed signage, and Beijing Daxing emphasized English and European language signs for luxury framed signage. These frames show that the airport designers are aware of their audience and their essential needs, but further seek to deliberately use language to promote commercial goals within the airport through commercially framed signage.

The higher percentage of commercial signage in the Beijing Daxing airport hints at the airport's greater emphasis on commerce from luxury stores, as opposed to Denver's airport. Denver International airport still places emphasis on commerce, but in a more subtle way, because many commercial references are interwoven in non-emergency directional signage and informational signage throughout the airport, such as naming parking lots after mountain ranges and having signs decorated with mountain backdrops that are sponsored by the airport itself.

Denver has functional signage that serves directional purposes and commercial purposes simultaneously, while Beijing seeks to separate their functional directional signage and commercial signage. At first glance, when comparing percentages regarding the categories of function with the airports' signs, it would appear that Beijing places a higher emphasis on commerce due to their larger number of commercial stores. Yet, the Denver signs seem to place more emphasis on commerce than first expected due to their functional signage working with dual purposes, i.e., both directional usage and commercial advertising for regional tourist attractions. Denver presents signage that sometimes employs two frames, regarding both

functionality and commercial advertising. Signage with these multiple frames was not seen within Beijing.

As stated in the methodology section, the signs for this research were recorded during a 2021 surge of COVID-19 infections, meaning that vaccines had not yet been released to the public and social distancing was the primary and most emphasized method of slowing the virus's spread. International travel restrictions were also in place. To educate users of spaces to social-distance appropriately and to work together, signage emerged as an important method to use so that users would learn to navigate a space appropriately. COVID-19 signage was seen on roughly 3% of signs in the Beijing Daxing airport, while it was seen on roughly 10% signs within the Denver International airport.

*Comparison of languages*

**Table 11: Comparison of Languages on Signs**

| Language | Denver | | Beijing | |
|---|---|---|---|---|
| | **n** | **%** | **n** | **%** |
| **Monolingual English** | 104 | 94.6% | 5 | 4.8% |
| **English over Spanish** | 2 | 1.8% | 0 | 0% |
| **Multilingual** | 1 | 0.9% | 13 | 12.5% |
| **Monolingual Mandarin** | 0 | 0% | 27 | 26% |
| **Mandarin over English** | 0 | 0% | 21 | 20.2% |
| **English over Mandarin** | 0 | 0% | 10 | 9.6% |
| **Equal Mandarin and English** | 0 | 0% | 9 | 7.7% |

As seen in Table 11 above, the Denver airport had a language other than English present on only 2.7% of signs, while Beijing had a language other than Mandarin on 54.8% of signs. Thus, it would seem that the Beijing airport is significantly more multilingual and language accessible than the Denver airport, reflecting its status as a global hub. The Beijing airport utilized primarily English and Mandarin, while other languages were present in the context of commercial stores. This was seen in stores signs for Gucci, HUI, Moncler, Estée Lauder, and Versace. The languages with the most practical use and utility were English and Mandarin, while other European languages appeared to signal prestige rather than function. The languages within the Beijing airport are associated with power, prestige, and positive language attitudes. For

example, the store name Gucci displays the Italian language, as there is no other instance of Italian present within the airport, it is rather a signifier of high status. As observed from the airport walkthrough video, there were very few lower-end retail stores for users to shop at, the presence of designer brand stores appeared to greatly outweigh stores that would be considered affordable for the average person. The presence of high-end stores referencing European languages indicates an attention to the audience of the airport. First, a significant percentage of shoppers at the airport must be able to afford goods at such high-end stores, signaling wealth. Second, when considering that the functional languages within the airport are English and Mandarin, this signals that the users of these stores are either English speakers or Mandarin speakers. When considering both the languages present in the airport as well as the wealth of the users, the audience of wealthy international English, often lingua franca, speakers, both native and lingua franca speakers, as well as Mandarin speakers becomes apparent. With the audience established, it may be clearer why there is less effort put into making the Beijing airport language accessible to outside audiences, as audiences who maintain a high level of wealth will be more likely to participate with the airports commercial spending culture, while those who are less wealthy may feel unwelcome.

Denver International Airport was primarily monolingual, with languages other than English appearing on only 2.7% of signs. Signs which used languages other than English appeared on COVID-19 signs, and a glass wall for an international visitors' center within the airport. Non-English languages were used in a functional manner twice, regarding the COVID-19 signage, and decoratively for the instance of the glass wall. Spanish was seen on the COVID-19 signage, while the decorative glass wall consisted of the languages Mandarin, English, Arabic, German, Japanese, Spanish, Korean, and French. The low number of foreign languages

on signage demonstrates that the Denver airport designers were either confident in their signs' pictographic ability to guide users to their destination in absence of foreign language accommodation, that the designers of the airport did not want to include foreign languages on signage in order to avoid making the airport appear less English privileged, or the airport designers have internalized the English-only ideology which is often present throughout the U.S..

Denver international airport received roughly 8,700 international travelers each day, signaling the importance for accommodating international audiences of foreign language speakers. Including languages other than English on signs, however, creates an image that could appear unaligned with the culture associated with the American English dialect, especially considering the English only movement which has been prevalent in the U.S. since the 1980s (Borden, 2014, p. 229). Non-English language signs might weaken the message of the airport that the designers intended for the users. An airport with predominantly one language, in this case English, creates a linguistic environment which can display values of nationalism, even at the cost of overriding the importance of function for the airport's signage. When a user navigates a space, they read the messages and cultural codes provided to them and act accordingly. These messages can be provided in the context of architecture, written language, spoken language, or even pictographs.

*Comparison of pictographs*

**Table 12: Comparison of Pictographs**

| Pictographs | Denver | | Beijing | |
|---|---|---|---|---|
| | n | % | n | % |
| **Pictographic with language** | 53 | 91.4% | 32 | 62.7% |
| **Pictograph only** | 5 | 8.6% | 19 | 37.3% |

Kostelnick and Hasset (2003) discuss the use of design elements and pictographs. Regarding design elements and pictographs, they argue that, "Unlike verbal languages, whose abstract codes provide a gatekeeping function for those who wish to enter their domains, design languages are far more perceptually and hermeneutically accessible" (p. 10). Readers of signs internalize ideals and social codes regarding pictographs, making sometimes abstract images into effective tools that allow a reader to interpret a message regardless of their verbal or written language backgrounds. The ability to easily interpret a pictogram can be contingent on the viewer's background. In some cases, the visual discourse community of pictographs is larger than communities of a written language, meaning that internationally recognized pictographs can be more widely recognized than language. Kostelnick and Hasset discuss users' ability to understand pictographs regarding their background and state,

> The mutability of conventions also underscores one of their most telling attributes: Their visual vocabulary is acquired by users – both the designers who deploy conventional codes and the readers who interpret them. Users are socialized in conventional practices, sometimes through formal training, oftentimes through a process of informal enculturation, until the conventions become habits of mind. Once learned, conventions

> perform an invaluable service for users by supplying the cohesion that makes visual language familiar, accessible, and imitable. (p. 23)

Pictographs, like language, operate by a series of conventions that users understand based on their cultural or professional background. Kostelnick and Hasset describe visual languages as operating in different dialects and registers, which their discourse communities use and shape. Some visual discourse communities are small, but others are large, especially in the context of globally-recognized public information symbols such as international caution signs, or red circles with lines through them. Considering that many airports share visual conventions, frequent airport-goers are an example of a visual language community. Gate signs, arrows, and security icons are all frequently seen in airports and are easily recognizable for travelers despite their written or verbal language background.

A higher percentage of pictographic signage was visible in the Denver airport than Beijing, but this is due to the large percentage of commercial signage present in the Beijing airport. In the non-emergency directional category of signage, both airports accompanied their text with pictographic supplements, such as an arrow or visual representation of what the sign stated. While Beijing signage utilized an equally privileged amount of Mandarin and English, and Denver signage was monolingual, utilizing just English, both airports utilized pictograms as supplements or replacements for written language.

**Fig. 18: Beijing directional signage**

**(Walk East, 2021)**


**Fig. 19: Denver directional signage**

**(Ozment, 2021)**


While Beijing signage may appear more understandable or accessible to an outside audience, it is important to note that the pictograms in the Denver airport are much more descriptive and increasingly frequent per-sign. The signage in the Beijing airport is mostly accessible and easy to understand for those who read English and Mandarin, but the audiences outside of those groups are excluded to a more severe degree than a user of the Denver airport.

In Figures 18 and 19 above, we can see Winn's (2014) rules of pictographs being put to practice in the Denver airport, but not as much in the Beijing airport. In the Beijing airport, a pictograph is placed next to the textual information, "Exit – Baggage Claim" accompanied by the Mandarin text and a pictogram of a hand grabbing a suitcase. This pictogram follows Winn's rules closely as it is self-explanatory, simple, generic, flat, and uniform. The sign then states, "Gates" accompanied by the letters "A", "B", "D". This bottom line of the sign is entirely language with no pictorial supplement. Each line is paired with a directional arrow. For the Denver sign, there are pictographs accompanying each line on the sign. "North Security" is followed by a pictogram of a TSA agent checking a bag, "All Gates" is followed by a pictogram of a plane leaving the ground, and the escalator is entirely pictographic, meaning that the

pictogram is not privileging any language and is instead entirely relying on the user's ability to understand the pictogram's meaning through visual conventions.

*Comparison of educational signage*

Cunningham and King (2021) interviewed an airport manager and learned why some language choices on signs may be absent, as well as the decisions behind the content of airport signage. Regarding language choices the authors observed that German was absent from signs within the Auckland New Zealand Airport, while Chinese, Japanese, and Korean were present on signs. Cunningham and King guessed that this may be due to German speakers being expected to speak and understand English as a lingua franca to navigate the airport.

> At Christchurch Airport we found signs in Chinese, Japanese, and Korean. Signs in German were absent, reflecting possibly the expectation that German tourists know at least some English. Our interview with the airport services manager confirms this: "So it's that idea that culturally again trying to avoid putting a myriad of languages on some signage. Just say 'OK we'll go with the English, the Mandarin, Japanese and Korean', we hoped we'd covered the vast majority of our demographic. (p. 100).

As noted above, all of the signs in this corpus fit into Cunningham and King's concept of educational signage by conveying cultural messages that the designers of the airport intended for their viewers.

The purpose of advertising signage within an airport is commonly related to tourism or general ways that users may spend money within the airport. Advertising signage functions educationally by revealing the airport designer's ideal user. By taking this framework and asking

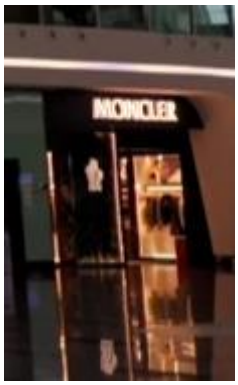
how a sign can reflect tourism or economic motives, signs can be compared between the Denver and Beijing airport. The signs below reflect economic motives.

**Fig. 20: Denver airport economic motives – encouraging tourism**

**(Ozment, 2021)**


**Fig. 21: Beijing Daxing airport motives – encouraging high-end shopping**

**(Walk East, 2021)**




The Denver sign above in Figure 20 directs readers to parking lots named after local attractions. While this is done with the purpose of giving users entertaining names to remember their parking lot name, it also serves a similar purpose of informing users about the local attractions in the region (FlyDenver). These signs fit into multiple frames, fitting into the commercial frame of outdoor adventure signage, while also fitting into the universally-needed information frame. Many signs within the Denver airport follow this trend and have names

which refer to local attractions, typically all mountain-related. This indicates, even for signage regarding parking and transportation, signage is geared towards encouraging users to participate in local tourism. This shows acute awareness of the audiences who may be navigating to Denver for travel and tourism, encouraging users to visit these areas and spend money on nearby attractions.

Denver's airport signage is nearly parallel to the New Zealand airport and Cunningham and King's analysis,

> Once visitors have actually arrived at their destination airport, local and national tourism interests will want them to experience as much as possible with a view to encouraging return visits. In addition, visitors who come for business purposes can be encouraged to visit tourist destinations while in the vicinity. New Zealand is a long way from anywhere else, and many visitors are aware of its reputation of having an unspoiled nature and the opportunity for a wide variety of outdoor activities. They may be less familiar with other destinations and activities in New Zealand, and this kind of tourist information may increase visitors' spending in the region. (2021, p. 102)

Signs within the Denver airport, even bars, as seen below, are adventure-themed and aimed at encouraging users to explore the nearby mountains. The Red Rocks bar, as seen below, is a reference to the famous Red Rocks Park and Amphitheatre, which is an open-air amphitheater built into a rock structure where large concerts are held. This is a well-known tourist attraction in the area which is openly referenced within the airport by means of naming a bar after it.

**Fig. 22: "Red Rocks" Themed Bar**

**(Ozment, 2021)**


Beijing, however, appears to be focused on engaging users with the airport itself, rather than nearby attractions. The airport is filled with designer brand stores that present items costing the equivalent of the ski and mountain trips advertised by the Denver airport. The Beijing airport likely engages an even higher status or wealthier crowd than the Denver airport due to a higher percentage of commercial stores within the airport, encouraging users to participate in the economy of spending within the facility.

Similar to Ku's (2020) study regarding critical discourse studies and linguistic landscapes, in and out-groups and ideologies have been identified by observing the language choices on signage. Denver signage has created an environment which enforces an English-only ideology, excluding those who speak other languages, while Beijing has created an environment which enforces a wealthy in-group, excluding those who do not fit into the target demographic of being upper-class.

*Comparison of visual communication and architecture*

While non-signage related, the new Beijing airport's architecture is also greatly extravagant compared to the older Denver airport. Beijing's high-end designer stores and

brilliant architecture act as a means of *education* as Cunningham and King (2021) refer to. Certainly, the beautiful new airport was designed in part to persuade international visitors of the economic power of Beijing, and to a greater extent, of China as a nation. The airport bolsters its brand by appearing lavish, spotless, and aesthetically pleasing. While Beijing's airport does not directly emphasize tourism through its signs, the luxurious appearance of the airport indirectly encourages tourism and leads users to view the city as a whole as wealthy. Kostelnick and Hasset discuss how the architecture of a building is a design which operates around enculturated codes as well (p. 10). The architecture of a building acts as a form of communication, as it conveys a message to the users of the space. Beijing Daxing's architecture communicates messages of authority, wealth, and power due to its extremely sleek and modern architecture. It is important to note as well, that Beijing Daxing was originally designed by a British architect, Zaha Hadid who died in 2016, before the project's completion. The design of the building was completed by a Chinese team of architects (Daxing PKX Airport). Beijing Daxing seeks to invite Western businesspeople and commerce, with stores like Gucci and Louis Vuitton, and the prevalence of English in the signage. All this points to the airport as a port of entry for Western and European commerce.

Denver International Airport's architecture is similarly elegant, but it reflects an older set of design values than Beijing Daxing. While the exterior of the airport is unique and presents a creative display of architecture by invoking the snow-capped mountain ranges to the west, the Denver International Airport's interior architecture resembles that of a standard U.S. airport. Much of the emphasis of things to do are not placed on the airport itself, situated 25 miles from downtown Denver, but rather the users are encouraged to visit the surrounding region. The

advertising within the airport as well as the airport's architecture both reflect what the users are persuaded and educated to do by the designers.

**Fig. 23: Denver International Airport – mountain-like exterior architecture**

**(Uncover Colorado, n.d.)**

*Comparing audiences*

The audiences navigating each airport appear to be different in kind. As we can observe the Denver airport focuses on engaging users on tourism outside of the airport, while the Beijing airport encourages, at least some, users to participate in high-end shopping within the airport. The architecture of the Denver airport is simple and effective, while the Beijing airport is grand and extravagant. Each airport is intended as a gateway to their city or region, with the airport seeking to project a carefully constructed image of its people, status, and opportunity. Revisiting Cunningham and King's (2021) points regarding educational signage, it is seen that Denver focuses on encouraging tourism opportunities within the region and state, while Beijing attempts to influence visitors' perceptions on China's economic image and brand of its city and country as a whole by including high-end stores and grand architecture.

Before exploring how Beijing displays power through its signage, it is important to note the overall cost of the Beijing Daxing airport as well as the architecture which composes the airport. While Chinese flags are not displayed in a nationalistic fashion throughout this airport, the airport's extreme high-status appearance and consumer goods costs establish a dynamic of China being in a position of power over others economically. Again, this trait of Beijing airport seeking to project images of authority and global power is not a characteristic unique to Chinese airports. This can likely be observed throughout other international airports, but this is a key difference between the Beijing and Denver airports.

*Gender*

Signage also enforces norms as represented in bathroom signs. Both the Denver and Beijing airport have similar bathroom signage, reflecting a widespread social construction of there being two genders. Beijing and Denver reinforce cultural beliefs about gender by modifying the universal man pictograph and including a woman pictograph as well. The female subject is distinguished from the male subject by including visual references to cultural norms around masculinity and femininity. Both Beijing and Denver do this by presenting the man as flat, and wearing pants, but depict the woman in a similar fashion in a skirt. Beijing's signage takes this a step further and depicts the male subject in blue and the female subject in pink (see Figures 24 and 25). The images below showcase socially constructed gender norms that have little to do with biological sex and normalize gender roles such as women wearing skirts and being associated with pink, and men lacking skirts and being associated with the color blue. In this respect, Spinillo (2012) discusses how pictographic gendered bathroom signage can be misinterpreted depending on what culture is viewing the pictograph, as the type of garment associated with male or female characteristics varies widely and thus signs may be difficult to

interpret (p. 3402). Here, the signs privilege specific visual discourse communities by acknowledging social norms around the typical colors and outfits a man or woman may wear. As discussed earlier, signs create an often false or constructed sense of normalcy and force users to act accordingly or be labeled deviant. Therefore, signs which present binary gender enact power over those who do not conform to societally constructed gender roles.

**Fig. 24: Gender influenced colors on Beijing bathroom signage**

**(Walk East, 2021)**

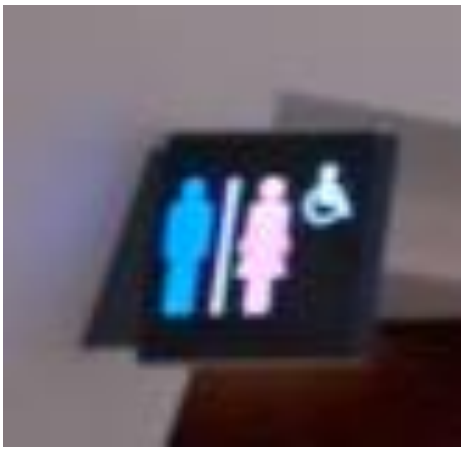
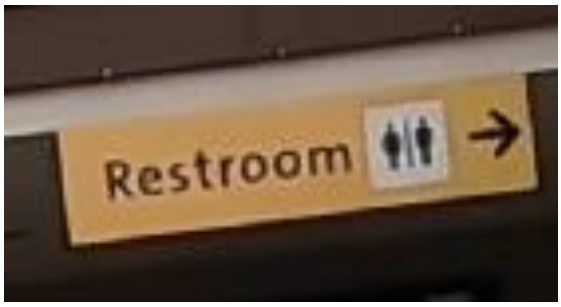


**Fig. 25: Gendered bathroom signage in Denver International Airport (Ozment, 2021)**




*Accessibility*

Signs within the Beijing and Denver airports both display dynamics of power. Some of the ways that power is displayed is shared between both airports, such as a binary view of gender being reinforced and upheld through the authority of signs. This dynamic of power is best analyzed through the lens of linguistic landscape theory, disability studies, and critical discourse analysis. Priyanti (2018) states, "language can be used as a powerful tool to establish and maintain ideologies" and argues that disability is constructed and maintained through discourse.

CDA fits easily into theories related to disability studies. Palmeri (2006) discusses the theory of normalization within technical communication and disability studies. Signage can perpetuate and enforce certain ideologies or binaries; this is seen especially in the signage below (see Figures 26 and 27). In the majority of signage, exclusively able-bodied and "normal" subjects were depicted on advertising as stick figures with a similar build. While disabled individuals were represented, it was exclusively through the universal and confining blue pictogram of a mobility-impaired subject in a wheelchair. No attempts were made to visually represent other types of impairments like visual or hearing impairments, even if assistive technology was available, as at the ticketing kiosks.

**Fig. 26: Beijing Standard Sign Subject (Walk East, 2021)**

**Fig. 27: Denver Standard Sign Subject (Ozment, 2021)**


Both airports display a similar depiction of the "universal man" on their signage. The stick figure is used to indicate where bathrooms are located, how to appropriately social-distance during the COVID-19 pandemic, and in conjunction with other pictographic images to designate actions or places of interest. The universal subject is represented as male, able bodied, and typically active. The pictograph is widely understood, but is not representative of all audiences who are reading these pictographs. Normalization (Palmeri, 2006) is produced by associating all users of the airport who are impaired with the universal symbol of disability, the blue wheelchair icon, rendering invisible many users who have disabilities other than movement impairments. Although both airports depict similar images of the universal male subject and the universal disabled subject, the data indicate that the Beijing airport includes pictographic depictions of humans on its signage far less frequently than the Denver airport. Beijing exempting human subjects from their disability signage thus stops the problematic trend with signs that portray a culturally "ideal body", and avoids normalizing ableist biases through pictograms.

Reflecting its more recent construction, Beijing Daxing's airport prides itself on each gate being a short walk from the center of the airport due to its "starfish shape," (Beijing Daxing PKX) which demonstrates a design with all abilities in mind, rather than creating a space designed for the able-bodied and seeking to accommodate those who are movement impaired. Boyle and Rivers (2016) discuss how spaces should be designed with disabled individuals in mind, rather than creating a space that ignores audiences and then later seeks to accommodate them in a potentially inconvenient or ineffective manner. Beijing Daxing Airport appears to do this despite being an airport that occupies a large mass of land. The older Denver Airport, however, occupies a large space of land and disabled users of this airport will have to rely on features such as the airport shuttle and transportation services in order to traverse the massive airport's space. Similar to Boyle and River's (2016) discussion of creating spaces with accessibility in mind, Beijing Daxing airport was designed to be more mobility accessible, while Denver Airport had to introduce features such as airport shuttles, trains, and busses to mitigate the difficult to navigate airport.

Beijing displayed the universal subject in the following three instances: on emergency exit signage, bathroom signage, and wet floor signage. It may be likely that due to Beijing being mostly a bilingual airport with signage in Mandarin and English, pictographic signage that depicts human subjects is used only in areas where the message is most imperative. Pictographs were exclusively present on utilitarian signs that fit into the universally-needed information frame. Human subjects were depicted on a subset of these signs if the message was absolutely imperative for legal reasons or basic human needs such as bathrooms. If a speaker of a language other than Mandarin or English is present within the Beijing airport, they would find pictographic signage most effective that prevents them from encountering legal issues and injury

in the airport, or simply to quickly find bathrooms. The universal handicapped subject was depicted in two instances on bathroom signage to indicate its accessibility. A wheelchair pictograph was displayed for a location to obtain wheelchairs, but the pictograph depicted a wheelchair with a human subject absent from the picture.

Denver, however, depicted the universal male subject often. The universal male subject was used to indicate bathroom locations, help desks, security, COVID-19 social distancing, elevators, and typically was presented with most functional signage throughout the airport. The universal male subject was used as a representation of accessibility throughout the Denver airport to indicate locations and accepted behaviors throughout the airport.

The depiction of the universal subject and universal handicapped subject is a form of power as defined by CDA and disability studies researchers such as Priyanti's (2018) study on disability being constructed through discourse, and Palmeri's (2006) discussion of normalization. Power is exerted over users of the airport as they must navigate an airport with signs that depict them. While some may fit the mold of what a sign depicts the "universal subject" as, the pictographic depiction of subjects creates an image of what a "normal" subject may look like, and this is further complicated by the difference of a universal able-bodied subject and universal disabled subject.

*Conclusion*

Although the data from each airport is not comprehensive, the evidence presented here suggests a number of useful observations in response to the key questions framing this study.

1. Who is the intended audience of a sign within these airports?

Denver International Airport's intended audience of signage are affluent monolingual or lingua franca English speakers. This is evidenced by a large amount of tourism related signage and important, functional signage being exclusively English.

Beijing Daxing International Airport's intended audience are affluent Mandarin or English speakers, both native and lingua franca speakers. This conclusion is based on the extravagant architecture of the airport and the presence of high-end designer brand stores and advertisements. The English-speaking audience of Beijing differs from Denver airport, due to English at that site being a lingua franca.

2. Are there design elements on these signs that reflect a social order?

Denver International Airport designed much of their functional signage to dually function for directional and informational purposes as well as commercial tourism purposes. This reflects a social order of welcoming those who are wealthier. Denver also only used multilingual signage in a decorative context, reflecting a social order that views English speakers as worthy of reading functional signage over differing language speakers. Spanish was also only present once, in the context of an impermanent COVID-19 sign, which means that the airport was originally designed with little to no Spanish signage, despite a sizable regional population of Spanish speakers and Spanish having the second most native speakers in the world (CIA World Factbook).

Beijing Daxing International Airport presents signage that privileges Mandarin and English, while not acknowledging other local Asian dialects. European languages such as Italian and French are present, but only in a commodified fashion that ornamentally displays their language to market goods that demonstrate affluence. This reflects a social order of Mandarin

and lingua franca English speakers being dominant, other European languages being employed for economic status, and an erasure of local dialects.

3. What multimodal elements are commonly used on airport signage?

Signs in Denver airport projected multimodal elements such as decorative pictures of mountains, which help elicit feelings of tourism and exploration regarding the Western U.S. Pictographs were also frequent, which benefit non-English speaking populations, but similarly show that foreign language speakers are not fully accommodated with their native languages.

Multimodal elements in Beijing Daxing are also seen in pictographs and the use of color, as well as being represented by the architectural spaces in which the signs are placed. Pictographs are frequent on signs and benefit non-English or Mandarin language speakers. Color is used to further demarcate ideas and social groups, such as the changing use of color on exit signs and the colored and gendered icons for bathrooms. The architectural space of Beijing Daxing creates feelings of authority for the users as they traverse the space and interact with the signs.

After a careful analysis of these airports' signs, we can see that Denver International Airport and Beijing Daxing Airport present similar commercial and economic values, encouraging users to participate in consumer spending in their regions. Both airports also similarly have a clear image of how they want to portray themselves and their sponsoring regional governments, with Denver and Colorado being constructed as places full of outdoor adventure opportunities, and Beijing as a wealthy city with lavish and high-end facilities and shops. Denver's terminal appears less commercially focused, by weaving persuasive commercial messages into directional signage and alluding to the regional attractions outside of the airport.

Denver included mountain ranges as the backdrop of their informational signage and incorporated bars and restaurants named after the theme of mountain exploration. Beijing overtly sought to communicate a lavish and extraordinary image with their expensive and contemporary architecture, spotless new airport, and the inclusion of designer shopping outlets. Beijing also appeared to align closely to Western values of commerce, by incorporating English on almost all the directional signage and hosting many European-branded high-end stores. Beijing Daxing Airport presents a meticulously constructed image that attempts to present Chinese economic power in a nationalistic fashion, while also accommodating Western visitors with English language signage and appeals to their commercial identity. This research demonstrated a connection between technical communication studies and linguistic theory. Signage, which is often studied in the field of technical communication as a way for users to interface with large spaces, benefits from a linguistic landscape analysis in order to reveal underlying biases in writing that reveal airport designers' construction of in and out-groups. Technical communication studies often view pictographs as ways to properly accommodate all audiences, while linguistic landscape studies on airports have often excluded pictographic analysis. This thesis demonstrates the connection between the two fields and how these disciplines may benefit one another through use of a close reading of technical texts with the accompaniment of linguistic theory.

*Directions for further research and limitations*

For future researchers who seek to answer similar questions regarding the intersection between the fields of technical communication and linguistics, international airports are rich subjects. Much of the research that was done for this study was compiled during the COVID-19 pandemic, meaning that finding recent data for international travel to airports was difficult due to

travel restrictions; this especially applies to performing a linguistic landscape analysis for Beijing Daxing International airport, as it opened only months before the initial wave of the COVID-19 pandemic.

Secondly, this study covered two international airports, but only the continents of Asia and North America were represented. While these two continents represent large populations with global power, they are not representative of all international values, and airports from other continents deserve an equal amount of research. Lastly, due to time and financial constraints, it was difficult to obtain photographs of these airports from sources other than third party videography from YouTube. The recording of these videos was not carried out with this study in mind, meaning that the videos may not have included all visible signs or elements necessary for the purposes of a linguistic landscape analysis. If possible, researchers should seek to record their own videos, or seek to have someone else record these videos, with the intention of the study in mind.

Lastly, disability studies represents a topic often discussed in this thesis, but this research only scratches the surface of what can be analyzed. This thesis analyzes disability through the lens of technical communication studies, but a disability-studies focused approach itself would be valuable. I recommend that researchers further question how to apply Palmeri's (2006) discussion of normalization, Boyle and Rivers (2016) article on versions of access, and Oswal's (2018) discussion of disabling pedagogies.

This study presented several limitations. Due to the previously mentioned physical and financial restraints of visiting distant airports, reviewing digital YouTube videos filmed by others and not specifically made for this purpose was necessary to develop the database of signage. This method limited the range of airports for analysis, as research was limited to recently published

videos and publicly available materials. Relying on a third party to create the video footage of signage may also have led to bias, as videographers tended to focus their cameras on aesthetic elements of an airport, rather than the seemingly mundane signs. Lastly, I need to acknowledge my perspective as a researcher is from a U.S.-educated, physically abled white male viewpoint. Although I have travelled extensively and interacted with diverse cultures, I have no more than a visitor's understanding of distant and international cultures.

# REFERENCES

Airport Technology. (n.d.). *Beijing Daxing International Airport*. Airport Technology. https://www.airport-technology.com/projects/beijing-daxing-international-airport-china

Ben-Rafael, E., & Ben-Rafael, M. (2018). *Multiple Globalizations: Linguistic Landscapes in World-Cities*. Boston: BRILL.

Blommaert, J. (2013) *Ethnography, superdiversity and linguistic landscapes: Chronicles of complexity*. Multilingual Matters.

Bonfanti, A. (2013). Towards an approach to signage management quality (SMQ). *Journal of Services Marketing, 27*(4), 312–321.

Borden, R. S. (2014). The English Only Movement: Revisiting Cultural Hegemony. *Multilingual Perspectives, 16*(4), 229–233. https://doi.org/10.1080/15210960.2014.956607.

Boyle, C., & Rivers, N. (2016). A Version of Access. *Technical Communication Quarterly, 25*(1), 29–47. https://doi.org/10.1080/10572252.2016.1113702

Brueggemann, B. J. (1999). *Lend me your ear: Rhetorical constructions of deafness*. Washington, D.C. Gallaudet University Press.

CIA. (n.d.). *The World Factbook*. CIA. https://www.cia.gov/the-world factbook/countries/world/#:~:text=most%2Dspoken%20language%3A%20English%20 6.5,2.6%25%20(2020%20est.)

Civil Aviation Administration of China. (2021, April 9). *2020 Civil Airports Statistics Report*. CAAC. caac.gov

Colorado Health Institute. (n.d.). *Speaking of health: A look at the health of Colorado's Spanish speakers*. Colorado Health Institute. https://www.coloradohealthinstitute.org/sites/default/files/migrated/postfiles/CHAS/CHS_Spanish_Snapshot2.pdf

Coupland, N. (2012). Bilingualism on display: The framing of Welsh and English in Welsh public spaces. *Language in Society, 41*(1), 1-27.

Culver, D., & Jiang, S. (2019, September 25). *Beijing's Daxing International Airport now officially open*. CNN Travel. https://www.cnn.com/travel/article/daxing-international airport-beijing-opens/index.html

Cunningham, U., & King, J. (2021). Information, Education and Language Policy in the Linguistic Landscape of an International Airport in New Zealand. *Linguistic Landscapes beyond the Language Classroom*, 99–117.

Davis, L. (1995). *Enforcing normalcy: Disability, deafness, and the body*. New York: Verso.

Daxing PKX Airport. (n.d.). *Beijing Daxing International Airport: The Biggest Airport in the World*. Daxing PKX Airport. https://daxing-pkx-airport.com/

Dobrin, D. (1985). Is Technical Writing Particularly Objective? *College English, 47*(3), 237 -251. https://doi.org/10.2307/376773

Dobrin, D. N. (2004). What's technical about technical writing. In J. Johnson-Eilola & S. A. Selber (eds.), *Central works in technical communication* (pp. 107-123). New York, NY: Oxford University Press.

Fairclough, N. (1995). *Critical discourse analysis: the critical study of language*. Longman.

FlyDenver. *Parking Lots*. Flydenver. https://www.flydenver.com/parking_transit/parking

Garland-Thomson, R. (1997). *Extraordinary bodies: Figuring physical disability in American culture and literature.* New York: Columbia University Press.

Garland-Thomson, R. (2002). The politics of staring: Visual rhetorics of disability in popular photography. In S. L. Snyder, B. J. Brueggemann, & R. Garland-Thomson (Eds.), *Disability studies: Enabling the humanities* (pp. 56–75). New York: The Modern Language Association.

Heinrich, P. (2010). Language Choices at Naha Airport. *Language in Public Space in Japan*, *3*, 343–358.

Huang, T., & Lardy, N. (2022, March 29). *Foreign corporates investing in China surged in 2021*. Peterson Institute for International Economics. https://www.piie.com/blogs/realtime-economic-issues-watch/foreign-corporates investing-china-surged-2021

Hubbard, R. (1997). Abortion and disability: Who should inhabit the world? In L. J. Davis (Ed.), *Disability studies reader* (pp. 187–202). New York: Routledge & Kegan Paul.

Hult, F. M. (2013). Drive-thru linguistic landscaping: Constructing a linguistically dominant place in a bilingual space. *International Journal of Bilingualism*, *18*(5), 507–523. https://doi.org/DOI:10.1177/1367006913484206

James, C. (2015). Rhetorical AccessAbility: At the Intersection of Technical Communication and Disability Studies. In T. Bridgeford, K. St. Amant, L. José (EDS.), *Programmatic Perspectives* (pp. 110-114).

Kim, S. (2012). Trends in Olympic Pictograph Design: A comparative study using Olympic Games' Sports Symbols. *Parsons Journal for Information Mapping*, 1–12.

Ku, E. K. (2020). Seargeant, Philip and Giaxoglou, Korina (2019). Discourse and the Linguistic Landscape. In: De Fina, Anna and Georgakopoulou, Alexandra eds. The Handbook of Discourse Studies. Cambridge: Cambridge University Press, pp. 306–326. *Critical Discourse Studies*, *17*(2), 156–174. https://doi.org/10.1080/17405904.2019.1656655

Kostelnick, C., & Hassett, M. (2003). *Shaping Information: The Rhetoric of Visual Conventions*. Southern Illinois University Press: Carbondale.

Kraus, P. K. A., & Grin, F. (2018). From glossophagic hegemony to multilingual pluralism?: Re-assessing the politics of linguistic identity in Europe. In *The Politics of Multilingualism : Europeanisation, Globalisation and Linguistic Governance* (pp. 89–109). John Benjamins Publishing Company.

Landry, R., & Bourhis, R. (1997). Linguistic Landscape and Ethnographic Vitality: An Empirical Study. *Journal of Language and Social Psychology*, *16*(1), 23–49. https://doi.org/10.1177/0261927X970161002

Leeman, J., & Modan, G. (2009). Commodified language in Chinatown: A contextualized approach to linguistic landscape. *Journal of Sociolinguistics*, *13*(3), 332–362. https://doi.org/10.1111/j.1467-9841.2009.00409

Lin, A. (2014). Critical Discourse Analysis in Applied Linguistics: A Methodological Review. *Annual Review of Applied Linguistics*, *34*, 213–232. https://doi.org/10.1017/S0267190514000087

Meloncon, L. (2013). *Rhetorical Accessability: At the Intersection of Technical Communication and Disability Studies*. Routledge. https://doi.org/10.4324/9781315231501

Neurath, O. (1936). *International Picture Language; The First Rules of Isotype: With Isotype Pictures* (K. Paul, Ed.). Trench, Trubner & Company, London.

Oswal, S. K. (2018). Can workplaces, classrooms, and pedagogies be disabling? *Business and Professional Communication Quarterly*, 81(1), 3–19.

Ozment, Brian. (2021, Mar 27). *Denver Airport - Check in and Walkthrough* [Video]. YouTube. https://www.youtube.com/watch?v=XWjQiJoAyTM

Palmeri, J. (2006). Disability Studies, Cultural Analysis, and the Critical Practice of Technical Communication Pedagogy. Technical Communication Quarterly, 15(1), 49–65. https://doi.org/DOI:10.1207/s15427625tcq1501_5

Pennycook, A. (2018). Linguistic Landscapes and Semiotic Assemblages. In M. Pütz & N. Mundt (Eds.), *Expanding the Linguistic Landscape: Linguistic Diversity, Multimodality and the Use of Space as a Semiotic Resource* (pp. 75–88). Multilingual Matters.

Priyanti, N. (2018). Representations of People with Disabilities in an Indonesian Newspaper: A Critical Discourse Analysis. *Disability Studies Quarterly*, *38*(4), 1. https://doi.org/10.18061/dsq.v38i4.5818

Renema, M. (2018). *Effective Airport Signage* (6167292.) [Master's thesis, Utrecht University]. Utrecht University Repository.

Russell, M. (1998). *Beyond ramps: Disability at the end of the social contract*. Monroe, ME: Common Courage Press.

Seargeant, Philip and Giaxoglou, Korina (2019). Discourse and the Linguistic Landscape. In: De Fina, Anna and Georgakopoulou, Alexandra eds. *The Handbook of Discourse Studies*. Cambridge: Cambridge University Press, pp. 306–326

Shaw, W. S., & Goff, J. (2016). Misrepresentation in tsunami warning signage: iconic denial. GeoJournal, 81(3), 333–336.

Spinillo, C. (2012). Graphic and cultural aspects of pictograms: an information ergonomics viewpoint. *Work*, *41*(1), 3398–3403.

Stevens, H. (2020). Building Access: Universal Design and the Politics of Disability. *Technical Communication Quarterly*, *29*(1), 99–102. https://doi.org/10.1080/10572252.2019.1613337

Uncover Colorado. (n.d.). *Denver International Airport (DEN)*. Uncover Colorado. https://www.uncovercolorado.com/transportation/denver-international-airport-den/

van Dijk, T. A. (1993). Principles of Critical Discourse Analysis. *Discourse & Society*, *2*(4), 249–283.

[Walk East]. (2021, March 3). *Walking In Beijing Daxing Airport | China's $17 Billion Mega Airport | 4K HDR | 北京大兴国际机场* [Video]. YouTube. https://youtu.be/f-8rY7ysf0c

Walwema, J. (2021). Diversity, Equity, and Inclusion in the Transactions. *IEEE Transactions on Professional Communication*, *64*(2), 102–104.

Wilson, J. (2009). Making disability visible: How disability studies might transform the medical and science writing classroom. *Technical Communication Quarterly*, *9*(2), 149–161. https://doi.org/10.1080/10572250009364691

Wilson, J. C., & Lewiecki-Wilson, C. (Eds.). (2001). *Embodied rhetorics: Disability in language and culture*. Carbondale: Southern Illinois University Press.

Winn, W. (2014). Increasing accessibility with a visual sign system: A case study. *Journal of Technical Writing and Communication, 44*(4), 451–473.

Woo, W. S., & Riget, P. N. (2020). Linguistic landscape in Kuala Lumpur international airport, Malaysia. *Journal of Multilingual and Multicultural Development*, 1–20. https://doi.org/10.1080/01434632.2020.1742724

Wodak, R., & Meyer, M. (2009). *Methods of Critical Discourse Analysis* (2nd ed.). Sage.

World Airport Codes. (n.d.). *World Top 30 Airports*. World Airport Codes. https://www.world airport-codes.com/world-top-30-airports.html

World Atlas. (2021, March 8). *10 biggest airports in the United States*. World Atlas. https://www.worldatlas.com/articles/10-biggest-airports-in-the-united-states.html