

Lonely by Design: How Third Space Type Shapes Social Behavior and Isolation Levels

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Abstract

Despite the increased usage of social media and technology to form connections, reported levels of loneliness are at an all-time high among Americans. The built environment, particularly third spaces, plays a role in this. The spaces that one reliably frequents, the activities they are able to do there, and the interactions they foster is related to one's overall social and civic engagement. We develop a theory of accessibility that argues that looking at an individual's experience in a space encompasses both physical and perceived accessibility. Using individual survey data, we analyze the relationship between third-space use and weak-tie loneliness. Overall, we find that perceived accessibility matters more to loneliness levels than physical accessibility to third spaces does. We hope to contribute to findings in urban planning and public health by highlighting how spatial design impacts social fabrics and mental health.

Introduction

Americans, especially younger generations like Gen Z, have become heavily-if not overly-reliant on technology as a medium to conduct social life and maintain friendships. Post-pandemic apathy of return to in-person gatherings and social outings have only exacerbated this trend that was brewing even before 2020. Consequently, reported feelings of loneliness are at an all-time high, even in the face of rising urban population density. Personal habits related to mental health and social media are popularly accounted for in their contributions to this recent broader cultural crisis, but few have evaluated the spatial and systemic composition of environments that shape, influence and prime one for interactions in daily life. Places that were once fertile grounds for casual neighborly or friendly social interaction have dried up or become less conducive to such interactions. Although no built environment can singlehandedly prevent loneliness, we can observe demographic and socioeconomic changes, as well as peoples' perceptions of themselves and others around them, and adapt spaces to afford practices that prevent loneliness in the modern day.

This erosion of what sociologist Ray Oldenburg in 1989 referred to as *third places*, or the changing perceptions of such places, which (the places) signify “the core settings of informal public life” and “a generic designation for a great variety of public places that host the regular, voluntary, informal, and happily anticipated gatherings of individuals beyond the realms of home and work” (Oldenburg 1989) is a significant yet inconspicuous driver of isolation and these widespread reported feelings of loneliness.

Current scholarly work on loneliness tends to stress the individual contributions and general demographic cohort trends like social media habits, the aging population, or the rise of remote work. Few have studied how urban policy and layouts prime residents for social interaction. This paper starts to close this deficiency in this research area via connecting spatial design to mental health outcomes, offering a systemic line of reasoning for a phenomenon frequently treated through an individualistic personal or cultural lens. Focusing on the concentration of third spaces will add value to a growing body of work in urban soci-

ology, public health, and political science that seeks to understand how built environments influence well-being.

We propose a theory of loneliness driven by the accessibility of third spaces. On a systemic level, the layout of third places and means of getting to them, preferring strip malls, standalone buildings, and traveling highways and interstates in private vehicles over mixed-use (retail and commerce combined with residential) and walking and mass public transit reduces the window of opportunity for informal gatherings to occur. Additionally, informal gathering is inhibited by private or public ownership of space. Downstream effects of this status quo results in the changing attitudes of people when they are in third places, as they become rigid and transactional. Finally, on a lower level, individuals experience increased feelings of loneliness and isolation due to reduced opportunities to casual social environments. Given these systemic circumstances and the downstream shifts in individuals' attitudes and behaviors, we hypothesize that individuals with isolated means of accessing third places, and feel blocked out by such spaces will report higher levels of loneliness.

This paper proceeds with an initial analysis into the insight of existing literature on the topic, concentrating on the structural issues which could help explain and correlate to existing findings.

Individual Loneliness and Social Disconnection

It is critical to define “loneliness”. There are two main reasons: providing a foundation for this inquiry, and knowing how to measure it.

A primary means of operationalization for individual feelings of loneliness in other notable studies includes polls and surveys based on a specific definition for what “feeling lonely” entails. The Healthy Minds Monthly Poll conducted by the American Psychiatric Association conceptualizes loneliness using the CDC’s definition, describing loneliness as “feeling like you do not have meaningful or close relationships or a sense of belonging” (APA 2024). However,

this and similar definitions seem to more closely describe the concept of social isolation or disconnection rather than loneliness. Other studies make a point to explicitly differentiate the two concepts; an advisory from the US Surgeon General Vivek Murthy describes social isolation as the specific lack of social relationships or infrequent social interactions, while loneliness is the resulting subjective distress felt as a result from an objective lack of social connection (Murthy 2023). These varying definitions are similar to Weiss’s (1973) theory of loneliness, where there is a difference between the feelings of loneliness experienced due to lack of close attachment to others (e.g., emotional loneliness from losing a loved one) or lack of social network (e.g., social loneliness from lacking a sense of community) (DiTomaso & Spinner 1996). Instead of purely focusing on direct behaviors people partake in, we want to address passive ways we can solve this issue too that may prime people to feel less lonely and foster more connection.

Loneliness has a variety of causes, and we have chosen to examine third spaces as one. These places provide settings for meeting up and bumping into people; thus, they reinforce our social networks (Oldenburg, 1989). However, while they may reinforce weak-tie relationships, they have much less impact on strong-tie relationships. This can be mapped on to Weiss’s identification of two parts to loneliness (lack of strong bonds or lack of a social network). Weak-tie relationships, however, should not be simply labelled as a weak form of loneliness. They reinforce our conception of the people in our life- further, these relationships can give rise to stronger bonds (Zhaoyang et al., 2022). Thus, when we examine loneliness, we are examining the power of frequent but short interactions- and how the built environment affects them.

From the above theories, our study will primarily look at rates of social loneliness in order to pinpoint potential connections between those rates and social opportunities of communities. The University of California, Los Angeles’s loneliness scale is a common device for measuring and quantifying loneliness among individuals. The most recent revision of the survey took place in 1996, but the accompanying questionnaire could potentially still yield

results that accurately represent individual feelings of loneliness to this day. The study asks participants a series of 20 questions, including statements such as, “how often do you feel that you lack companionship” and “how often do you feel alone”, providing a rating scale from 1 (never) to 4 (often). The 1996 study results conclude that there is a correlation between loneliness and individual social behaviors, but that loneliness appears to be a distinct psychological experience (Russell 1996). Proceeding with our study based off existing theories, we aim to examine the correlations between social disconnection and the psychological experience of loneliness, specifically looking to see if different structures and types of third spaces act as a causal mechanism.

Literature Critique

Third places—social spaces outside home and work—are widely recognized as potential buffers against loneliness and as supports for civic participation (Oldenburg, 1989). Yet, despite recurring claims that access to such places promotes social well-being, the concept of “accessibility” remains theoretically unspecified and operationally inconsistent in the literature. Accessibility is often overlooked in the literature; studies often cite the benefits of third spaces as a whole (Finlay et al., 2019; Jeffres et al., 2009; Littman, 2021). These overlook the invisible forces that attract a people to third spaces and encourage them to linger there, engaging with the space and others in it. Then, what makes a space seem accessible to enter and linger? How does one define “accessibility”? The current lack of a clear consensus weakens evidence surrounding the relationship between third-place accessibility and loneliness.

A first ambiguity concerns whether accessibility is conceived as proximity or permissibility. Many spatial studies adopt walkability metrics—density, proximity, and distribution of third-place amenities—to predict social connection opportunities (Rhubart et al., 2022; Yu, 2025). These approaches provide valuable insights into structural inequities: lower-

income and racially marginalized neighborhoods often have fewer accessible social amenities within walkable distance. However, such metrics assume that physical nearness translates into usable access. A person might live near a pub-dominated district yet feel socially unwelcome, financially constrained, or surveilled. Thus, walkability measures capture potential accessibility more than realized accessibility.

Conversely, qualitative and ethnographic research emphasizes psychological and cultural entry barriers: discomfort in commercial spaces, exclusion due to staff behavior, or feelings of not belonging (Finlay & Kobayashi, 2019; Littman, 2021). This work conceptualizes accessibility as the ability to participate without implicit gatekeeping. But due to smaller samples, such studies struggle to generalize spatial patterns or quantify loneliness outcomes. Together, these methodological divides leave “accessibility” fractured between geographic convenience and social permission—rarely both.

Ownership categories introduce a second ambiguity. Much research assumes public spaces (parks, libraries, plazas) are inherently more accessible and inclusive than privately owned commercial spaces (cafés, gyms) (Banerjee, 2007; De Magalhães, 2010), and that the increase in commercialization leads to a withering of an inclusive, public life (Banerjee, 2007). Such privately owned spaces require spending money or adhering to consumption norms (Francis, 2012). Yet empirical evidence complicates this binary. For instance, public parks may lack human facilitation for social interaction, while privately owned cafés can foster rich weak-tie encounters for those who feel comfortable there. Sandstrom and Dunn (2014) show that engagement with service workers in commercial settings can reduce momentary loneliness, implying private spaces play substantial social roles. At the same time, commercial surveillance and time-limits increasingly constrain who belongs and for how long (Littman, 2021). Thus, ownership does not reliably predict sociability and may inadequately capture access barriers that matter for loneliness. Furthermore, cafes and coffee shop chains such as Panera, Starbucks, and other industry players have shifted their stores from fostering community and lingering to prioritizing table and seat turnover and mobile order and

delivery pickups, as evident in decor and furniture choices of newer or recently-renovated stores.

This is further complicated by research that contrasts short-interaction venues (e.g., coffee shops, bookstores, station seating areas) with structured social environments such as community centers. Brief encounters have measurable benefits for mood and immediate belonging (Sandstrom & Dunn, 2014; Zhaoyang et al., 2022), but there is limited evidence that weak-tie interactions translate into reductions in chronic loneliness. Grishina et al. (2023) find that structured programming (for instance, classes provided at a school or studio) produces deeper relational ties and longer-term social support—benefits not guaranteed in casual commercial spaces. Yet structured environments themselves may entail invisible barriers: registration fees, cultural expectations, or exclusionary social dynamics.

The result is ambiguity in the effects of third spaces- by type and by the specific effect. Researchers infer that increased accessibility to third places should ease loneliness, but causal mechanisms are uncertain (Kallander, 2025). Cross-sectional designs dominate the field, making it difficult to distinguish whether accessible third places reduce loneliness or whether less-lonely, more mobile individuals are simply more likely to use them (Finlay & Kobayashi, 2019).

Another neglected dimension is perceived accessibility. Two residents might experience the same nearby café differently: one views it as a welcoming community hub; the other sees it as economically or culturally exclusionary. Walkability metrics cannot capture these subjective barriers to belonging. Without accounting for experiences of inclusion or safety, accessibility measures risk conflating proximity with participation and availability with welcome.

Another consideration overlooked is equity, which exacerbates these measurement flaws. Marginalized groups—older adults, newcomers, people with disabilities—are both more at risk of loneliness and less likely to feel comfortable in commercialized or surveilled spaces (Yu, 2025). Even when third places exist nearby, meaningful access may be lower. Yet few studies

stratify loneliness outcomes by demographic or identity group, limiting the field’s ability to advocate for social infrastructure design that addresses exclusion rather than simply spatial gaps.

Moreover, civic participation research—though promising—suffers from similar ambiguity. Access to third places correlates with greater local belonging and civic engagement (Jeffres et al., 2009), but researchers have not decisively shown that accessibility conditions (public/private governance, walkability) drive these effects. Theoretical pathways include cross-class contact, norm-sharing, and recruitment into neighborhood efforts (Littman, 2021), but rigorous causal tests remain limited. Thus, a stronger link between accessibility of third spaces, given a rigorous definition, and loneliness levels needs to be provided. By conceiving of accessibility as physical and perceived and by looking at individual experiences in a quantifiable way, we aim to help close this gap in the literature.

Theory

There is a connection between the type of third space and the kinds of activity and relationships it fosters. However, the literature is unclear on what factors cause what— and which are the most important for decreasing loneliness levels among people who frequent those places. Two salient features emerge: public versus private ownership and accommodation of structured versus unstructured activity. These two characteristics are often in tension: one may think a large open public park or field leads to more civic activity (and thus a defining of “public spirit”) due to its openness to all. One is not prohibited entry for not paying for an item or going to the third space with a specific purpose. However, stimulus is often needed for interaction to occur. There is much less incentive in public spaces to regularly maintain the area and organize events, services, or products that would draw people in.

The hypothesized relationship between third-space type and loneliness operates through three interrelated mechanisms: (1) geographic barriers that reduce opportunities for incident-

tal social interaction; (2) economic barriers that limit one’s ability to linger in commercial environments; (3) intangible social characteristics and barriers that people use as heuristics in determining whether or not a space is welcoming. We theorize that spaces that involve private ownership, while still allowing the public in, such as shops along a main street, lead to decreasing loneliness levels among those who frequent those spaces. These spaces balance economic accessibility with an incentive to maintain services that stimulate the public. A privately owned restaurant is open to those who can afford it and those who have the narrow focus to eat. A grocery store is open to those who simply want to buy groceries. These spaces that allow structured activity are more stimulating– yet exclusionary to those who simply wish to wander, explore, and linger, especially in a car-dominated culture. Places that exist between public and private, such as an open-air market, allow the public to wander in without pressuring them to perform a specific activity. Yet what draws the public in is the activity stimulated by private interests. These areas then encourage lingering and the formation of weak-tie relationships. As mentioned previously, weak tie relationships form a reliable part of one’s social circle; thus, spaces that encourage this formation should decrease loneliness levels, once strong relationship factors are accounted for (e.g. a loss of a loved one).

We operationalize this theory on four components: (1) ownership of third spaces (public, private, or hybrid); (2) the structure (or lack thereof) of the activity occurring in a given space; (3) accessibility, defined by the frequency of visits people make to a space, a space’s approachability (in other words, openness to entry), and a place’s perceived tolerance of lingering. Lastly, outcomes will be measured on the common standard of reported feelings of inhabitants on (4) questions assessing weak-tie loneliness. This common unit of measurement and the criteria it is measuring will reveal specific combinations of the criteria that are conducive to lower levels of reported loneliness, while distilling these results so they are free of confounding variables, such as one’s existing social ties (or lack thereof).

Our three research questions are: (1) How does physical inconvenience (distance and

commute time relative to willingness) relate to weak-tie loneliness? (2) How do perceived characteristics of a third space (invitingness and ownership type) relate to loneliness levels? (3) How do interaction frequency, depth, and time spent in a third space relate to loneliness levels, and do these patterns differ by ownership type?

Our hypotheses are: H1: Higher inconvenience ratios will correlate with higher weak-tie loneliness. H2a: More inviting spaces will correlate with lower weak-tie loneliness H2b: Public spaces will correlate with lower weak-tie loneliness than private or mixed spaces, given their greater universal accessibility. H3a: Greater interaction frequency, depth, and hours spent will each correlate with lower loneliness, with depth having the strongest effect. H3b: Interaction frequency, depth, and hours spent will differ significantly by ownership type.

Research Design

This study examines whether third spaces that combine private ownership with unstructured, publicly accessible activity are associated with lower levels of loneliness, after accounting for individuals' existing social relationships. While prior literature recognizes that third spaces facilitate social interaction, it remains unclear which characteristics of these spaces matter most for reducing loneliness and through what mechanisms.

The analysis will use original individual-level survey data, gathered from online survey sites, designed to directly measure third space usage, social ties, and loneliness outcomes. The dependent variable, loneliness, will be measured using questions taken from multiple established loneliness scales, such as the UCLA Loneliness Scale. These have been validated. The reason why we chose questions from multiple scales was because no single validated scale assesses weak-tie loneliness. We chose questions that we deemed suitable for this purpose. Responses will be aggregated into a continuous loneliness index, with higher scores indicating greater perceived social isolation. The survey will be made in Qualtrics and distributed via CloudConnect. Our sample size had 393 respondents with demographics proportional from

the most recent census data.

The primary independent variables capture the type of third spaces respondents frequent. Respondents will report how often they visit different categories of spaces, including publicly owned spaces (e.g., public parks, libraries), privately owned but publicly accessible spaces (e.g., cafés, grocery stores, main street shops), and hybrid spaces (e.g., open-air markets). For each space type, respondents will indicate whether their visits typically involve structured activity (requiring a specific task or purchase) or unstructured activity (wandering, lingering, or passive presence). These measures (“How deep are your interactions (at work)”); “Think about the places that you often visit throughout the week, such as a campus, restaurants, parks, offices, or shopping malls. Answer the following questions for the three spaces that you spend the most time in. What is the space? (ex. cafe, barbershop, market, etc)”, etc) allow third spaces to be classified along the two dimensions central to the theory.

To isolate the effect of third space characteristics on loneliness, the survey includes several control variables. Strong social ties are measured through questions on the number of close relationships, frequency of contact with family and close friends, and recent major social disruptions such as bereavement or relocation. Weak ties are measured through the frequency of casual interactions with acquaintances, neighbors, or service workers. Additional controls include age, income, education, employment status, and neighborhood mobility characteristics such as car ownership and perceived walkability. We chose to control for these factors because they are unique to individuals and are not directly caused by whatever space they may be occupying in a given moment.

The scope will be limited to adults in the United States. The US, despite its economic prosperity, faces increasing loneliness. We wish to investigate this unique phenomenon. Further, loneliness has a large cultural component—some cultures are more collectivist or individualist. Including other countries in the design allows more confounding variables to confuse any link there may be between third space type and loneliness levels.

To analyze our data, we clean the data and assign variables using R. Figures are generated

in R, primarily visualizing distributions and correlations between variables relevant to our hypotheses.

To test our three hypotheses, we estimate a separate OLS regression model for each theoretical mechanism, with weak-tie loneliness score as the dependent variable throughout. Model 1 tests H1 by regressing loneliness on physical accessibility, operationalized as distance and commute inconvenience ratios. Model 2 tests H2a and H2b by regressing loneliness on perceived invitingness and ownership type, with public spaces serving as the reference category. Model 3 tests H3a and H3b by regressing loneliness on interaction frequency, depth, and hours spent, again including ownership type to examine whether interaction patterns differ across space types. Chattiness — each respondent’s self-reported comfort initiating conversation with strangers — is included as a control variable in all three models to account for individual disposition that may independently drive both third-space engagement and loneliness outcomes.

$$\hat{Y}_i = \beta_0 + \beta_1 \text{DistInconv}_i + \beta_2 \text{CommInconv}_i + \beta_3 \text{Chattiness}_i + \varepsilon_i \quad (1)$$

$$\hat{Y}_i = \beta_0 + \beta_1 \text{Inviting}_i + \beta_2 1[\text{Private}]_i + \beta_3 1[\text{Mixed}]_i + \beta_4 \text{Chattiness}_i + \varepsilon_i \quad (2)$$

$$\hat{Y}_i = \beta_0 + \beta_1 \text{Freq}_i + \beta_2 \text{Depth}_i + \beta_3 \text{Hours}_i + \beta_4 1[\text{Private}]_i + \beta_5 1[\text{Mixed}]_i + \beta_6 \text{Chattiness}_i + \varepsilon_i \quad (3)$$

where $\hat{Y}_i$ is the predicted weak-tie loneliness score for respondent i (higher values indicate less loneliness); DistInconv_i and CommInconv_i are the distance and commute inconvenience ratios, calculated as actual travel burden divided by each respondent’s self-reported willingness threshold; Inviting_i is the mean perceived invitingness score across the three reported

spaces (1–5 scale); $1[\text{Private}]_i$ and $1[\text{Mixed}]_i$ are indicator variables for ownership type, with public spaces as the reference category; Freq_i , Depth_i , and Hours_i are the mean interaction frequency, interaction depth, and hours spent per week across the three reported spaces; Chattiness_i is each respondent’s self-reported comfort initiating conversation with strangers (1–5 scale); and ε_i is the error term.

This research design directly addresses a gap in existing work by moving beyond broad distinctions between public and private space and instead examining how ownership incentives and activity structure interact to shape everyday social experiences. Using survey data allows us to collect individual experiences while being able to analyze them in a quantifiable way. Using validated measures and individual-level data ensures credible estimation; however, the analysis cannot definitively establish causality. Long-term loneliness levels that have been established by frequent interactions cannot be tested in a random, controlled experiment. By controlling for variables such as strong ties and recent life events, the design can mitigate concerns that loneliness itself drives third space selection.

Empirical Analysis

If the main argument holds, we would expect to see higher physical inconvenience ratios (commute and distance inconvenience) rising with weak-tie loneliness scores. As for perceived accessibility, we investigate features directly related to the third space itself, such as perceived invitingness, length and depth of social interaction fostered there, and ownership type. We would expect that weak-tie loneliness scores decrease with higher scores of perceived invitingness, as well as length and depth of social interaction. In addition, if our hypothesis is correct, more time spent in third spaces should correlate with lower loneliness as well. Further, loneliness scores should differ across ownership type—that is, individuals who tend to frequent private versus public versus mixed ownership spaces ought to have different levels of loneliness. Lastly, if our theory of ownership type holds true, we expect

that interaction depth and frequency is higher in mixed-ownership spaces and is lowest in privately owned spaces. Subsequently, individuals who tend to frequent privately-owned spaces may be lonelier.

While we do not formally hypothesize any differences across demographic data, we would expect loneliness levels to be higher among older and unemployed individuals, who may have less opportunity to frequent third spaces. We expect the same for people living in suburban or rural regions compared to urban areas. In general, we expect more people to most frequently visit privately-owned areas. And lastly, we expect our control variables, chattiness and recent loss of a loved one, to have an effect on our data. Specifically, loneliness levels should drop once accounted for.

Distributions of the Independent Variables

The independent variables fall into three groups: physical accessibility, perceived accessibility, and interaction characteristics—plus ownership type as a moderating dimension.

Physical accessibility is operationalized through two ratio measures, commute inconvenience and distance inconvenience. Both are calculated as actual travel burden divided by the respondent’s self-reported willingness threshold. As shown in Figures 1 and 2, both distributions are strongly right-skewed, with the majority of respondents clustering below the willingness threshold (ratio of 1), meaning most people frequent spaces that fall within their comfortable travel range. A notable tail above ratio 1 does exist, however, indicating that a meaningful minority regularly exceeds their own stated tolerance.

Perceived accessibility is captured through respondents’ ratings of a space’s openness to others and its tolerance for lingering. As Figure 12 shows, perceived invitingness clusters at levels 4 and 5, suggesting respondents generally view their chosen spaces favorably — though this likely reflects selection bias, since people tend not to return to spaces they find unwelcoming. Interaction characteristics are measured through depth and frequency of social contact. Depth skews toward the superficial end of the scale (Figure 7), while frequency

clusters in the moderate range (Figure 10), suggesting that visits are regular but the social contact they produce remains relatively shallow. Hours spent per week, shown in Figure 11, peaks around 2.5 and drops off sharply beyond 5 hours, reinforcing that engagement tends to be episodic. Finally, ownership type (Figure 13) shows that private spaces — such as restaurants and cafes — are by far the most commonly frequented, with roughly 250 of 393 respondents identifying a privately owned space as their primary third space, consistent with the expectation that commercially driven spaces dominate everyday American social geography. The control variable, chattiness, has a rather even distribution with a peak at score 4 (comfortable talking to strangers).

Distribution of the Dependent Variable

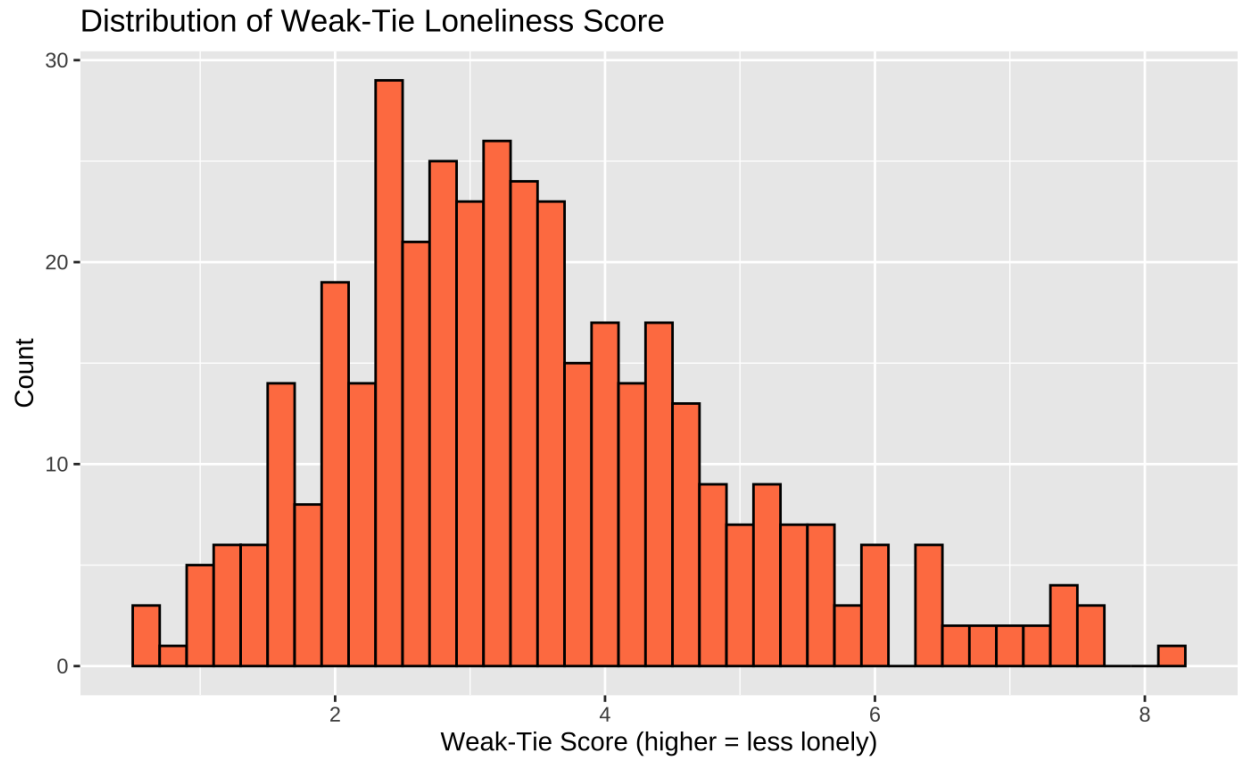


Figure 1: Distribution of Weak-tie Loneliness Scores

The distribution of weak-tie loneliness scores (where a higher score indicates less loneliness) follows an approximately normal distribution with a slight right skew, centering around

scores of 3–5. This spread indicates meaningful variation in weak-tie social experience across the sample, validating our scale as a sensitive enough instrument to detect gradations in social disconnection. The range of scores — from near 1 to near 8 — demonstrates that weak-tie loneliness is not a binary condition but rather exists on a continuous spectrum, reinforcing the utility of treating it as a continuous dependent variable in subsequent analyses. The distribution’s modest rightward lean suggests that most respondents experience some degree of weak-tie social engagement, but the substantial left tail confirms a sizable portion of the sample reports significant disconnection from casual social contact in their daily third-space encounters.

H1: Higher inconvenience ratios will correlate with higher weak-tie loneliness.

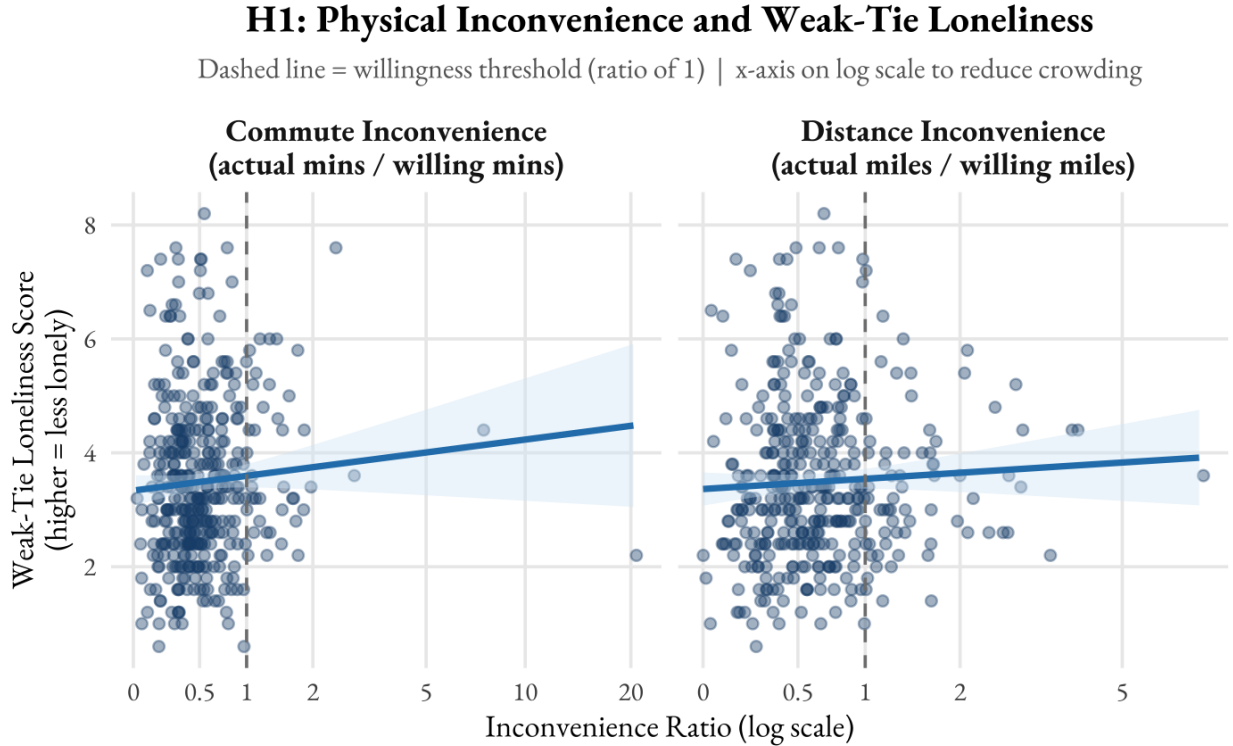


Figure 2: Physical Inconvenience and Weak-Tie Loneliness

The scatter plots for both commute and distance inconvenience against weak-tie lone-

liness (Figure 10) reveal no meaningful trend. Data points are widely dispersed across all inconvenience ratios, and while a slight positive slope is technically visible in the regression line, the degree of scatter renders it substantively uninformative. Respondents with high inconvenience ratios show just as wide a range of loneliness scores as those whose third spaces fall well within their willingness threshold. This pattern does not support H1. Physical inconvenience, as measured here, does not appear to be a reliable predictor of weak-tie loneliness — people who travel far beyond their stated comfort threshold are not systematically lonelier than those whose third spaces are conveniently located. This may reflect the fact that individuals who endure greater physical inconvenience to reach a space are self-selecting into spaces they find particularly rewarding, partially offsetting any negative effect of the travel burden itself. It may also suggest that the barriers most consequential to weak-tie loneliness are perceptual and social rather than geographic. Physical access is a necessary but clearly insufficient condition for the kind of casual social engagement that buffers against weak-tie loneliness.

H2a: More inviting spaces will correlate with lower weak-tie loneliness

The relationship between perceived invitingness and weak-tie loneliness is among the clearest observed in this analysis. As spaces are rated more inviting (from level 2 to level 5), mean weak-tie loneliness scores rise substantially — from approximately 1.75 to nearly 4.0 — with a tight standard error band throughout, indicating a stable and consistent association. This supports H2a: individuals who perceive their primary third spaces as welcoming and open report meaningfully lower levels of weak-tie loneliness. The steepest gains occur between invitingness levels 2 and 3, suggesting that moving from an unwelcoming to a merely neutral space may carry the largest marginal benefit. It should be noted, however, that perceived invitingness is likely endogenous to the social experience within a space: people who already have more positive social interactions in a space may rate it as more inviting. This limits

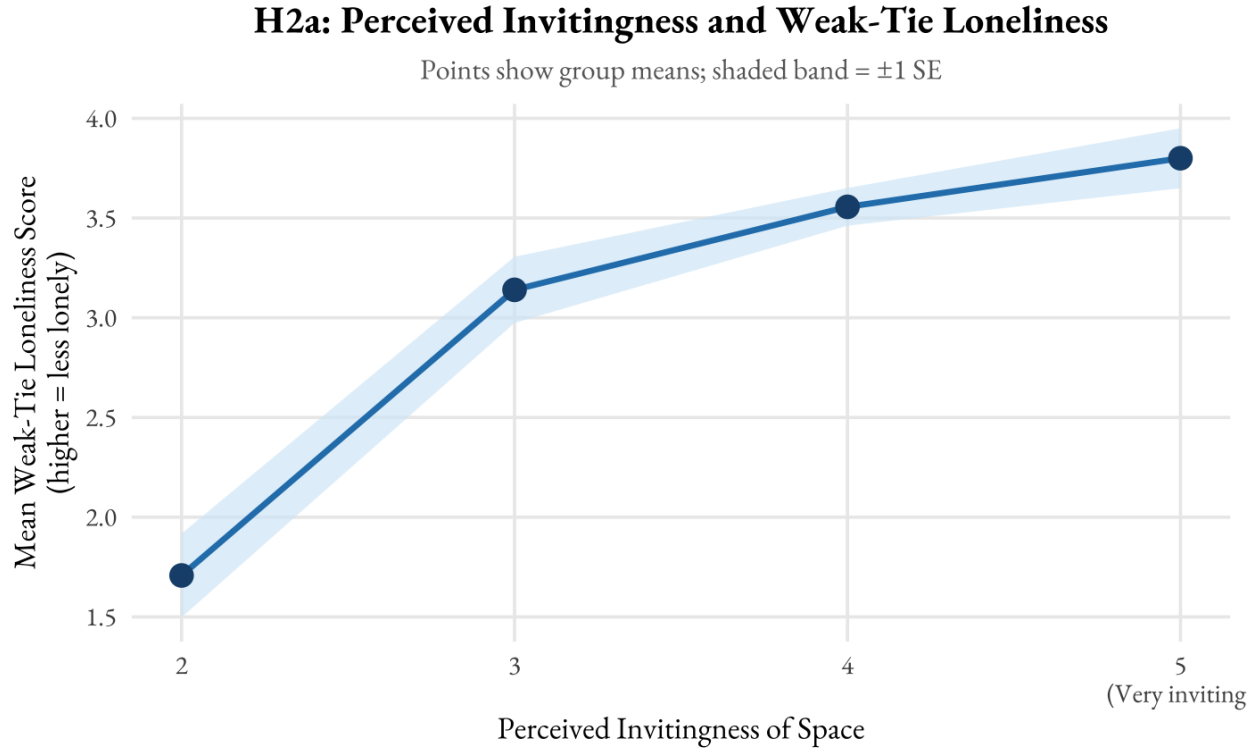


Figure 3: Perceived Invitingness and Weak-Tie Loneliness

causal inference. Still, the finding is practically significant — designing spaces to feel approachable and inclusive may function as a lever for reducing social loneliness even before any formal social programming is introduced.

H2b: Public spaces will correlate with lower weak-tie loneliness than private or mixed spaces, given their greater universal accessibility.

Contrary to the prediction in H2b, the ownership type box plots reveal only modest differences in mean weak-tie loneliness scores across public, private, and mixed spaces. Mixed-ownership spaces register a slightly higher mean weak-tie score (approximately 4.1), suggesting fractionally less loneliness, while private spaces score lowest (approximately 3.7), with public spaces falling between the two. This does not support the hypothesis that public

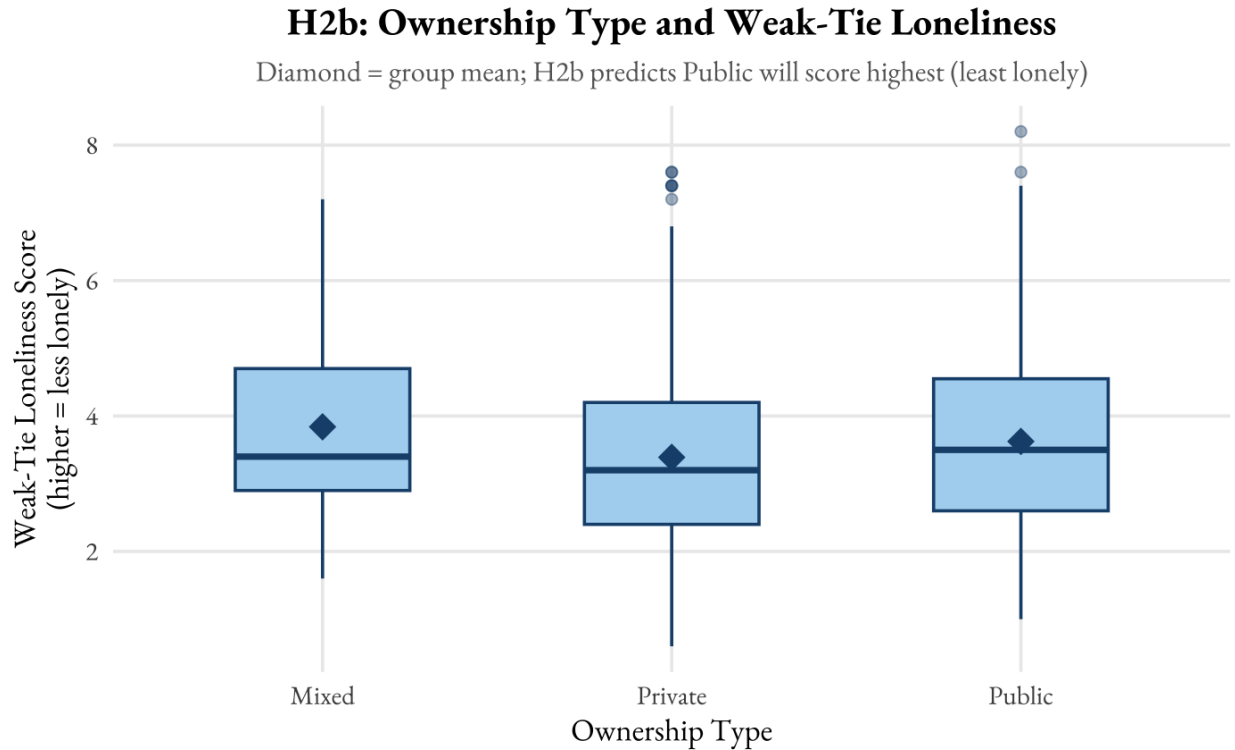


Figure 4: Distributions of Weak-Tie Loneliness Scores per Ownership Type of Third Space spaces, by virtue of their universal physical accessibility, are most strongly associated with reduced weak-tie loneliness. One interpretation is that public spaces, despite being open to all, lack the consistent human facilitation and activity stimulus that draws people into sustained interaction. Privately owned spaces may generate more frequent casual contact through service encounters and structured commerce, but these interactions tend to be brief and transactional. Mixed spaces, which combine private incentives to attract visitors with more permissive lingering norms, may represent a modest sweet spot — though the differences observed here are not dramatic and should be interpreted with caution in the absence of regression-level controls.

H3a: Greater interaction frequency, depth, and hours spent will each correlate with lower loneliness, with depth having the strongest effect.

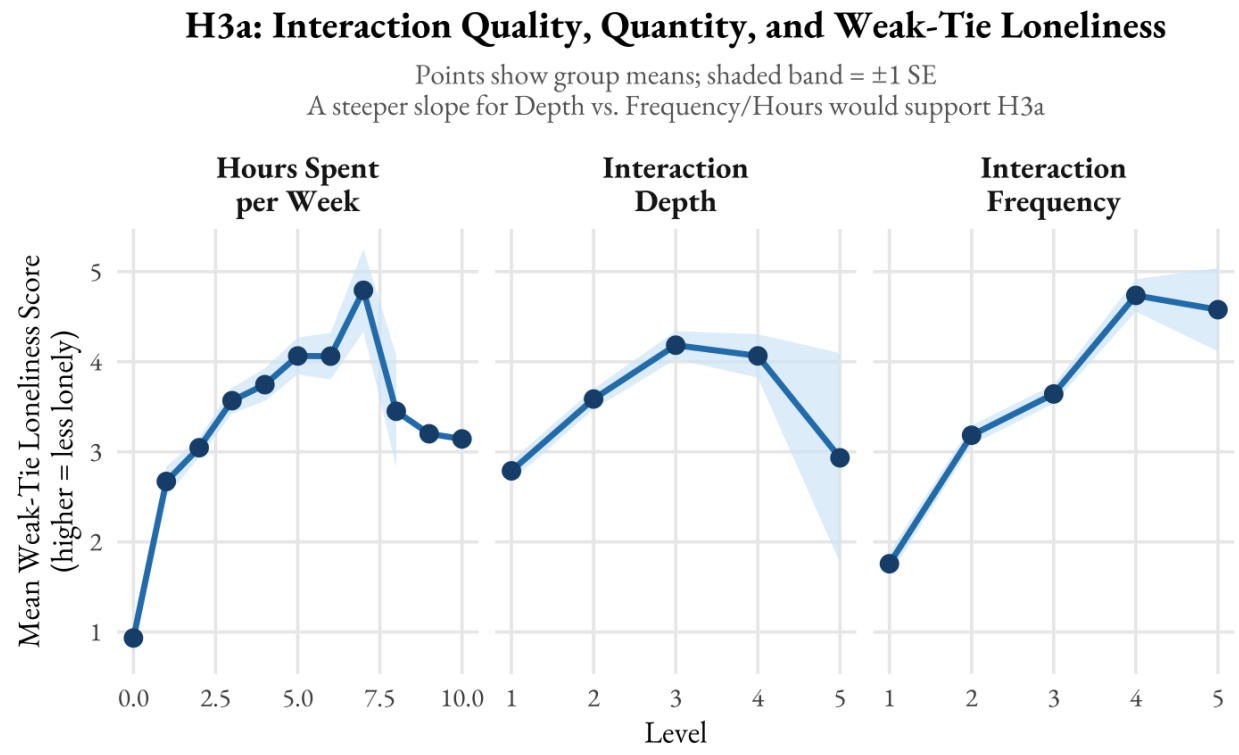


Figure 5: Change in Weak-tie Loneliness Scores as Hours Spent in Third Space, Interaction Depth, and Interaction Frequency Change

The interaction quality and quantity chart presents a nuanced picture for H3a. Hours spent per week shows a non-monotonic relationship with weak-tie loneliness: scores increase as hours rise toward roughly 7.5 hours per week, but decline at the highest time-use levels. This may reflect a ceiling effect or suggest that individuals spending the most time in third spaces do so partly out of a lack of other social options. For interaction depth, the relationship is generally positive; deeper interactions correlate with higher (less lonely) weak-tie scores. However, the relationship flattens or dips at the highest depth level, potentially reflecting the small cell sizes at level 5. Interaction frequency shows the most consistent positive trend, with loneliness scores increasing monotonically as people report interacting more often.

Against the H3a prediction that depth would show the steepest slope, the data suggests that frequency may be equally or more important for weak-tie loneliness specifically, which makes theoretical sense, since weak-tie bonds are constituted by regularity of contact rather than intimacy. Taken together, the data confirm that all three dimensions of social engagement matter, but the hierarchy among them is less clear-cut than theorized.

H3b: Interaction frequency, depth, and hours spent will differ significantly by ownership type.

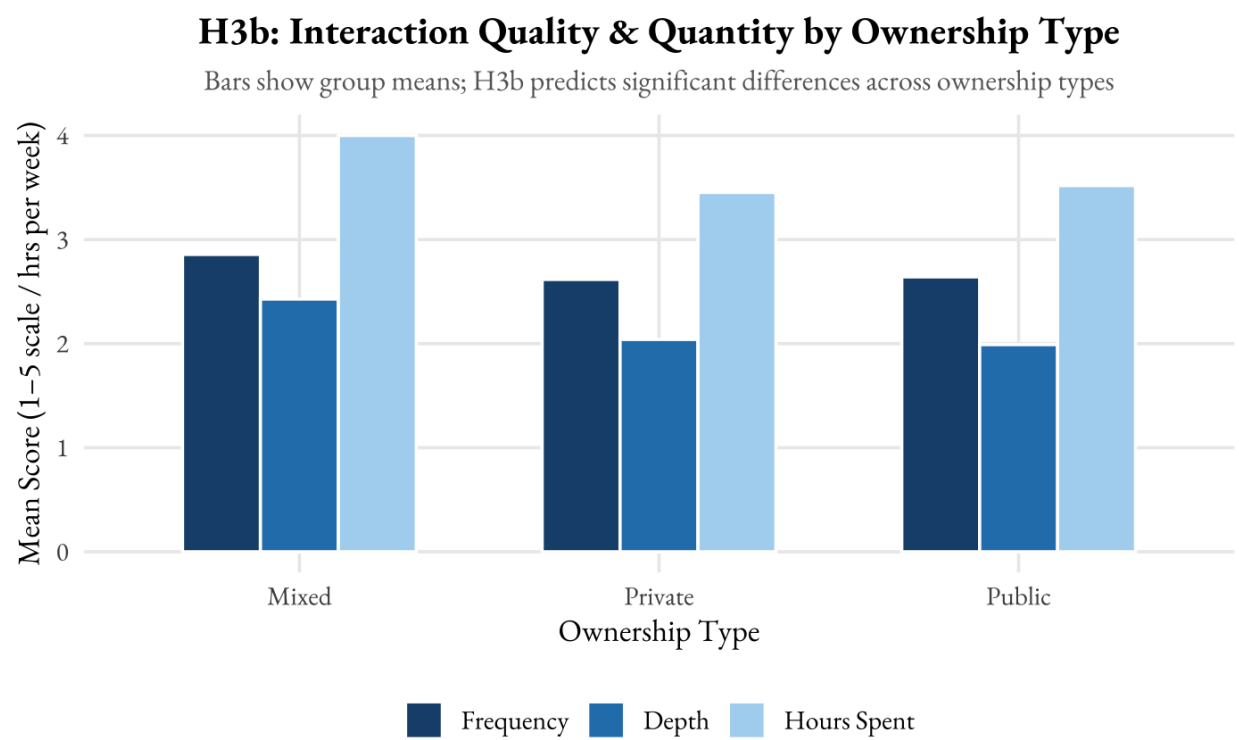


Figure 6: Hours Spent in Third Space and Interaction Length and Depth by Ownership Type

The grouped bar chart for H3b shows that interaction quality and quantity do differ by ownership type, though not always in the direction predicted. Across all three ownership categories, hours spent is consistently the highest-scored dimension, while interaction depth is lowest — suggesting that time investment in third spaces outpaces the relational depth

those visits produce regardless of ownership. Mixed-ownership spaces register higher hours spent compared to private or public spaces, consistent with the theory that hybrid spaces encourage lingering. Private and public spaces both show notably lower depth scores relative to their frequency scores, which reinforces the idea that ownership alone does not guarantee meaningful interaction. Public spaces show slightly higher depth relative to their frequency compared to private spaces, which aligns with the finding from the broader analysis that public spaces, while visited less often, may foster somewhat more substantive encounters when they do occur — consistent with the absence of consumption pressure and table-turnover norms. Overall, these patterns lend partial support to H3b: ownership type is associated with differences in the profile of interaction, even if the differences are more in degree than in kind.

Regression Analysis

There are three regression equations, one for H1, H2a/b, and H3a/b. See the regression table in the appendix.

Model 1: Physical Accessibility (H1)

Model 1 finds no statistically significant relationship between physical inconvenience and weak-tie loneliness, reinforcing the conclusion reached in the graphical analysis. Neither distance inconvenience ($\beta = 0.175$, $SE = 0.113$, $p = 0.123$) nor commute inconvenience ($\beta = 0.062$, $SE = 0.065$, $p = 0.339$) reaches conventional significance thresholds, and the negative sign on commute inconvenience runs counter to the direction H1 predicted. The one strong result is the control variable: chattiness is highly significant ($\beta = 0.480$, $SE = 0.052$, $p < 0.001$), indicating that an individual’s baseline comfort initiating conversation with strangers is a far more powerful predictor of weak-tie social engagement than how far they travel to reach a third space. The model explains a modest 17.7% of variance in weak-tie loneliness (adjusted $R^2 = 0.177$), most of which is attributable to chattiness rather than the physical

accessibility measures. H1 is not supported.

Model 2: Perceived Accessibility (H2a, H2b)

Model 2 provides the clearest support for any single hypothesis in the study. Perceived invitingness is a statistically significant positive predictor of weak-tie loneliness scores ($\beta = 0.289$, $SE = 0.098$, $p = 0.003$), meaning that respondents who feel their third spaces are welcoming report meaningfully lower loneliness — consistent with H2a. A one-unit increase in perceived invitingness is associated with roughly a 0.29-point increase in the weak-tie score, holding ownership type and chattiness constant. Ownership type, however, shows no significant effect: neither private ($\beta = 0.161$, $SE = 0.152$, $p = 0.289$) nor mixed spaces ($\beta = 0.242$, $SE = 0.255$, $p = 0.344$) differ significantly from public spaces on weak-tie loneliness, meaning H2b is not supported. The negative sign on private ownership is directionally consistent with the theory — private spaces are associated with slightly higher loneliness than public ones — but the effect is not distinguishable from noise. Chattiness again performs strongly ($\beta = 0.445$, $SE = 0.053$, $p < 0.001$). The model explains 19.7% of variance (adjusted $R^2 = 0.197$).

Model 3: Interaction Characteristics (H3a, H3b)

Model 3 is the strongest of the three, explaining 33.1% of variance in weak-tie loneliness (adjusted $R^2 = 0.331$), and yields the most substantively interesting results. Interaction frequency is a strong, highly significant predictor ($\beta = 0.676$, $SE = 0.113$, $p < 0.001$): respondents who interact with more people in their third spaces report substantially lower loneliness. Hours spent is also significant and positive ($\beta = 0.138$, $SE = 0.034$, $p < 0.001$), suggesting that simply spending more time in third spaces is independently associated with less weak-tie loneliness. Interaction depth, however, tells a more complicated story: its coefficient is negative ($\beta = 0.180$, $SE = 0.103$, $p = 0.081$) and only marginally significant at the 10% level. This is the opposite direction from H3a, which predicted that depth would

have the strongest positive effect. One interpretation is that in the context of weak-tie relationships specifically, deeper interactions may crowd out the breadth of casual contact — a respondent having one meaningful conversation may be doing so instead of many brief ones, leaving their weak-tie score lower. Ownership type remains non-significant in this model as well (private: $\beta = 0.225$, $p = 0.101$; mixed: $\beta = 0.028$, $p = 0.903$), and chattiness retains its significance ($\beta = 0.340$, $SE = 0.050$, $p < 0.001$). H3a is partially supported for frequency and hours but contradicted for depth; H3b is not supported.

Conclusion

This study set out to examine whether the structural characteristics of third spaces — their ownership type, the accessibility barriers they present, and the kinds of social interaction they foster — are meaningfully associated with weak-tie loneliness among American adults. Across three regression models and a set of descriptive analyses, the findings offer a partial but useful answer to the initial questions.

Physical inconvenience, the first mechanism we theorized, does not emerge as a significant driver of weak-tie loneliness. The near-absence of a relationship between commute and distance inconvenience and loneliness scores suggests that Americans are largely self-sorting into third spaces they find physically reachable, and that once they arrive, the geography of getting there recedes in importance. What matters more is what happens inside the space. Perceived invitingness, our primary measure of perceived accessibility, is a consistent and significant predictor: respondents who experience their third spaces as welcoming report lower weak-tie loneliness, even after controlling for individual disposition. This finding affirms what qualitative researchers have long argued — that the subjective sense of belonging in a space is not merely a downstream effect of social interaction but a precondition for it. Ownership type, by contrast, does not independently predict loneliness outcomes in any of our three models, complicating prior assumptions that public spaces are inherently more

socially inclusive than private or hybrid ones.

The strongest results come from Regression Model 3, which examines interaction characteristics. Frequency of interaction and hours spent in third spaces are both strong positive predictors of lower weak-tie loneliness, while interaction depth, the variable we expected to have the largest effect, carries a negative and only marginally significant coefficient. In the context of weak-tie relationships, depth of conversation may actually trade off against breadth: a person absorbed in one meaningful exchange may be less available for the many brief, casual encounters that constitute a healthy weak-tie social life. This suggests that third spaces serve their social function not primarily by hosting profound conversations, but by providing reliable, low-stakes conditions for repeated, brief contact. Places such as the park bench, barbershop, and open-air market function quietly, through accumulation rather than intensity.

Across all three models, the chattiness control variable performs rather consistently, remaining one of the strongest predictors of weak-tie loneliness regardless of what else is included. This finding provides some credence to the strength of individual factors contributing to loneliness. Individual disposition shapes how people move through and engage with built environments, and no amount of thoughtful urban design will fully substitute for a person's baseline openness to social contact. The built environment is not destiny. What it can do, however, is create or foreclose the conditions under which that openness gets exercised. A space that feels uninviting, that penalizes lingering, or that is inconvenient to reach does not cause loneliness, but it narrows the window in which connection might otherwise occur.

These findings carry implications for urban planners, public health researchers, and policymakers grappling with the loneliness epidemic. The evidence suggests that investment in spaces that lower barriers to casual, repeated interaction — particularly spaces that feel genuinely welcoming and accommodate lingering without consumption pressure — is more likely to improve weak-tie loneliness than simply increasing the density of social amenities. The distinction matters, for a neighborhood can be full of cafes and parks and still feel

socially dry if those spaces are transactional, surveilled, or culturally exclusionary. What communities need are spaces that invite people to stay without asking anything of them in return.

There are several limitations to this study. The cross-sectional survey design prevents causal inference: we cannot rule out the possibility that less lonely individuals are simply more likely to seek out and perceive their third spaces as inviting, rather than the reverse. The sample, while proportionally drawn, was collected online and may underrepresent populations with lower digital access — precisely those groups, such as older adults and lower-income residents, who are most at risk of loneliness and least likely to frequent commercially driven spaces. The operationalization of ownership type relied on respondents’ own perceptions, which may not accurately reflect legal ownership structures. And the focus on weak-tie loneliness, while theoretically motivated, leaves the question of strong-tie loneliness and its relationship to third spaces largely unaddressed.

Future research should pursue longitudinal designs capable of establishing causal direction, and should stratify analyses by demographic group to better understand how the relationship between third-space type and loneliness varies across age, income, race, and geography. The subgroup analyses initiated here — examining how weak-tie loneliness and interaction patterns differ across urban, suburban, and rural contexts — represent a promising direction that a larger and more targeted sample could develop more rigorously. There is also meaningful work to be done on the role of structured versus unstructured activity within spaces, a dimension the current study theorized but could not fully operationalize with the available data.

Oldenburg warned decades ago that the erosion of third places would leave communities impoverished in ways that aggregate economic and demographic statistics would fail to capture. The loneliness epidemic now unfolding across the United States suggests he was right. This study contributes one thread to the growing body of evidence that the spatial organization of everyday life shapes social experience — and that recovering a richer public

life may require attending, carefully and deliberately, to the places where that life used to happen.

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Note on AI

Microsoft Copilot and ChatGPT were used to gather some of the references by typing in a prompt, such as “Please provide sources related to public and private third spaces.” All other ideation was done by the researchers.

Appendix

Table 1: OLS Regression Models: Predictors of Weak-Tie Loneliness Score

	Model 1	Model 2	Model 3
	Physical Access	Perceived Access	Interaction
<i>Physical accessibility</i>			
Distance inconvenience	0.175 (0.113)		
Commute inconvenience	−0.062 (0.065)		
<i>Perceived accessibility</i>			
Invitingness		0.289** (0.098)	
Ownership: Private ^a		−0.161 (0.152)	−0.225 (0.137)
Ownership: Mixed ^a		0.242 (0.255)	−0.028 (0.232)
<i>Interaction characteristics</i>			
Interaction frequency			0.676*** (0.113)
Interaction depth			−0.180 (0.103)
Hours spent per week			0.138*** (0.034)
<i>Control variable</i>			
Chattiness	0.480*** (0.052)	0.445*** (0.053)	0.340*** (0.050)
Constant	1.900*** (0.194)	1.028* (0.430)	0.683** (0.243)
Observations	384	389	389
R^2	0.183	0.205	0.342
Adjusted R^2	0.177	0.197	0.331

Note: Dependent variable is weak-tie loneliness score (higher = less lonely). Coefficients are unstandardized OLS estimates. Standard errors in parentheses. Empty cells indicate the variable was not included in that model.

^a Reference category for ownership type is Public space.

*** $p < 0.001$; ** $p < 0.01$; * $p < 0.05$; $p < 0.1$

Appendix: Survey Instrument

Study: Lonely By Design: How Third Space Type Shapes Social Behavior and Isolation Levels

Conducted by Abbey Chen and Calvin Mauldin

Under the direction of faculty advisors Elle Diether and Michael Findley, Professors at the University of Texas at Austin.

Consent and Information Statement

You are invited to be part of a research study. Your participation is voluntary and it is totally up to you to decide whether you want to participate. Even if you decide to be part of the study now, you may change your mind and stop at any time. The activity involves research. We ask you to complete a 10–15-minute online questionnaire that asks you about your interaction with third spaces (such as proximity to third spaces) and your levels of social engagement, using shortened versions of loneliness scales, such as the UCLA Loneliness Scale. We collect basic demographic information, but your name will not be collected. Your participation in this study is completely voluntary, and you are free to withdraw or stop participating at any time. The risk associated with this study is no greater than everyday life. The records of this study will be stored securely, and the data collected will be anonymous. All publications will exclude any information that will make it possible to identify you as a subject. If you have questions about your rights as a research participant, please contact the University of Texas at Austin Institutional Review Board: Phone: 512-232-1543; Email: irb@austin.utexas.edu.

Part I: Demographics

Q1. What year were you born?

Q2. What is your gender identity?

[noitemsep, topsep=4pt]

- Male
- Female
- Other
- Prefer not to say

Q3. What is your race and/or ethnicity? *Select all that apply.*

[noitemsep, topsep=4pt]

- American Indian or Alaska Native
- Asian
- African American or Black
- Hispanic or Latino
- Middle Eastern or North African
- Native Hawaiian or Pacific Islander
- White
- Prefer not to say
- Prefer to self-identify

Q5. What is the highest level of school you have completed or the highest degree you have received?

[noitemsep, topsep=4pt]

- High school degree / GED

- Associate's Degree / some college
- Bachelor's Degree / college
- Graduate or Master's program
- Doctoral program

Q6. In which industry is your current occupation? *Select the best descriptor.*

[noitemsep, topsep=4pt]

- Government
- Healthcare
- Education
- Technology
- Financial Services
- Manufacturing
- Retail
- Logistics
- Hospitality
- Professional Services
- Other

Q7. Which of the following best describes your place of residence and the surrounding area?

[noitemsep, topsep=4pt]

- Urban

- Suburban
- Rural

Part II: Political Affiliation

Q43. Which of the following best describes your political affiliation?

[noitemsep, topsep=4pt]

- Democrat
- Republican
- Independent
- Other

If Independent or Other:

Q46. Do you tend to lean towards one party over the other?

[noitemsep, topsep=4pt]

- Lean Democrat
- Lean Republican
- Truly Independent (no lean)

If Democrat or Lean Democrat:

Q44. Would you describe yourself as a strong Democrat or leaning Democrat?

[noitemsep, topsep=4pt]

- Strong Democrat

- Leaning Democrat

If Republican or Lean Republican:

Q45. Would you describe yourself as a strong Republican or leaning Republican?

[noitemsep, topsep=4pt]

- Strong Republican
- Leaning Republican

Part III: Spaces Frequented

The following questions repeat for each of three spaces. Respondents were asked to identify the three spaces they spend the most time in throughout a typical week and answer the following questions for each.

Space 1

Q9. Think about the places that you often visit throughout the week, such as a campus, restaurants, parks, offices, or shopping malls. Answer the following questions for the three spaces that you spend the most time in. What is the space? (*ex. cafe, barbershop, market, etc.*)

Q40. How much time do you spend there in a typical week in hours? *If more than 10, put the slider at 10.*

_____ hours per week

[Slider: 0–10]

Q13. How frequently do you interact with people there? Rank on a scale of 1 to 5.

1 = Don't engage with anyone 5 = Talk to a great deal of people

_____ [Scale: 1–5]

Q14. How deep are your interactions there? Rank on a scale of 1 to 5.

1 = Brief, superficial conversation 5 = Meaningful conversation

_____ [Scale: 1–5]

Q41. About how far is the space from where you live in miles? *If more than 20, move the slider to 20.*

_____ miles [Slider: 0–20]

Q38. How far are you typically willing to travel to go to a third space? (*Miles*)

_____ miles [Slider: 0–20]

Q42. How long do you commute to this space in minutes? *If more than 120, place the slider at 120.*

_____ minutes [Slider: 0–120]

Q39. What is the longest commute you would take to travel to a third space? (*Minutes*)

_____ minutes [Slider: 0–120]

Q16. How easy is it to get to the space?

1 = Inaccessible or inconvenient. May have to drive a while to get there.

5 = Convenient to access.

_____ [Scale: 1–5]

Q17. How inviting does the space feel?

1 = Very uninviting 5 = Very inviting

_____ [Scale: 1–5]

Q18. To your knowledge, is the space publicly or privately owned?

[noitemsep, topsep=4pt]

- Public, such as a public park
- Private, such as a restaurant
- Mixed
- Don't know

Space 2

Q47. Think of another place that you often visit throughout the week, such as a campus, restaurants, parks, offices, or shopping malls. What is the space? (*ex. cafe, barbershop, market, etc.*)

Q48. How much time do you spend there in a typical week in hours? *If more than 10, put the slider at 10.*

_____ hours per week [Slider: 0–10]

Q49. How frequently do you interact with people there? Rank on a scale of 1 to 5.

1 = Don't engage with anyone 5 = Talk to a great deal of people

_____ [Scale: 1–5]

Q50. How deep are your interactions there? Rank on a scale of 1 to 5.

1 = Brief, superficial conversation 5 = Meaningful conversation

_____ [Scale: 1–5]

Q51. About how far is the space from where you live in miles? *If more than 20, move the slider to 20.*

_____ miles

[Slider: 0–20]

Q53. How long do you commute to this space in minutes? *If more than 120, place the slider at 120.*

_____ minutes

[Slider: 0–120]

Q55. How easy is it to get to the space?

1 = Inaccessible or inconvenient. May have to drive a while to get there.

5 = Convenient to access.

_____ [Scale: 1–5]

Q56. How inviting does the space feel?

1 = Very uninviting 5 = Very inviting

_____ [Scale: 1–5]

Q57. To your knowledge, is the space publicly or privately owned?

[noitemsep, topsep=4pt]

- Public, such as a public park
- Private, such as a restaurant
- Mixed
- Don't know

Space 3

Q58. Think of another place that you often visit throughout the week, such as a campus, restaurants, parks, offices, or shopping malls. What is the space? (*ex. cafe, barbershop, market, etc.*)

Q59. How much time do you spend there in a typical week in hours? *If more than 10, put the slider at 10.*

_____ hours per week [Slider: 0–10]

Q60. How frequently do you interact with people there? Rank on a scale of 1 to 5.

1 = Don't engage with anyone 5 = Talk to a great deal of people

_____ [Scale: 1–5]

Q61. How deep are your interactions there? Rank on a scale of 1 to 5.

1 = Brief, superficial conversation 5 = Meaningful conversation

_____ [Scale: 1–5]

Q62. About how far is the space from where you live in miles? *If more than 20, move the slider to 20.*

_____ miles [Slider: 0–20]

Q63. How long do you commute to this space in minutes? *If more than 120, place the slider at 120.*

_____ minutes [Slider: 0–120]

Q64. How easy is it to get to the space?

1 = Inaccessible or inconvenient. May have to drive a while to get there.

5 = Convenient to access.

_____ [Scale: 1–5]

Q65. How inviting does the space feel?

1 = Very uninviting 5 = Very inviting

_____ [Scale: 1–5]

Q66. To your knowledge, is the space publicly or privately owned?

[noitemsep, topsep=4pt]

- Public, such as a public park
- Private, such as a restaurant
- Mixed
- Don't know

Part IV: Social Engagement

The following questions ask about your levels of social engagement. Please indicate how often each statement matches what you experience.

1 = Never 2 = Rarely 3 = Sometimes 4 = Often 5 = Always

Q20. How often do you feel that there is no one you can turn to for support?

_____ [Scale: 1–5]

Q21. How often do you feel part of a group of friends?

_____ [Scale: 1–5]

Q22. How often do you feel that your interests and ideas are not shared by those around you?

_____ [Scale: 1–5]

Q24. How often do you feel close to people?

_____ [Scale: 1–5]

Q25. How often do you feel that your relationships with others are not meaningful?

_____ [Scale: 1–5]

Q27. How comfortable are you starting a conversation with a stranger?

1 = Very uncomfortable 2 = Somewhat uncomfortable 3 = Neutral

4 = Somewhat comfortable 5 = Very comfortable

_____ [Scale: 1–5]

Part V: Weak-Tie Relationships

Q30. In a typical week, how many times do you have brief, casual conversations with people outside your close circle, such as acquaintances, service workers, or neighbors?

_____ times per week [Slider: 0–20]

Q31. How frequently do you go a full day without speaking to anyone other than close friends or family?

1 = Never 2 = Sometimes 3 = About half the time

4 = Most of the time 5 = Always

_____ [Scale: 1–5]

Q32. On days when you have more brief, casual, or incidental interactions with people, how much does your sense of loneliness change?

1 = Not at all 2 = A little 3 = A moderate amount 4 = A lot 5 = A great deal

_____ [Scale: 1–5]

Q33. On a scale of 1 to 5, how strongly do you feel a sense of belonging in your neighborhood or local community?

1 = I don't feel any sense of belonging 5 = I feel a strong sense of belonging

_____ [Scale: 1–5]

Q36. How many places do you feel that you are a regular at? *If more than 10, move the slider to 10.*

_____ places

[Slider: 0–10]

Figures

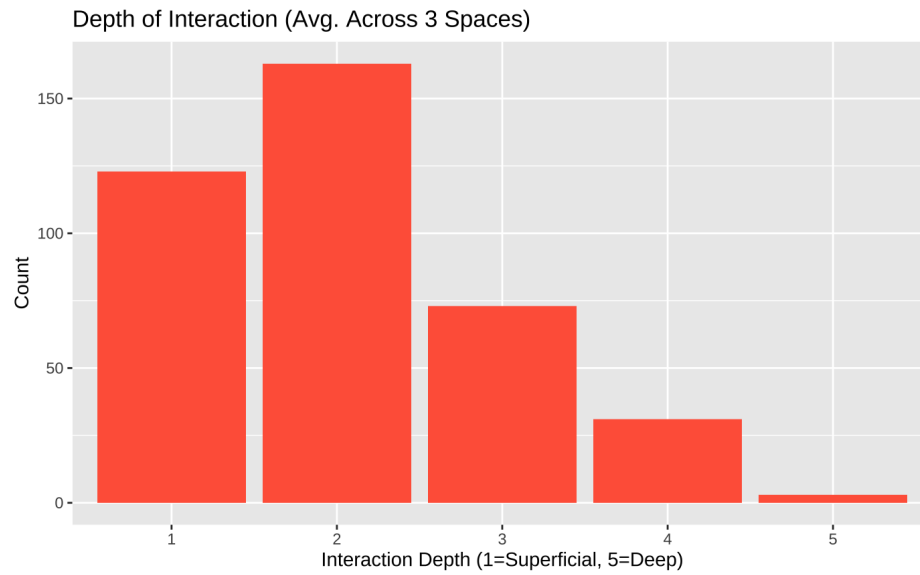


Figure 7: Depth of Interaction

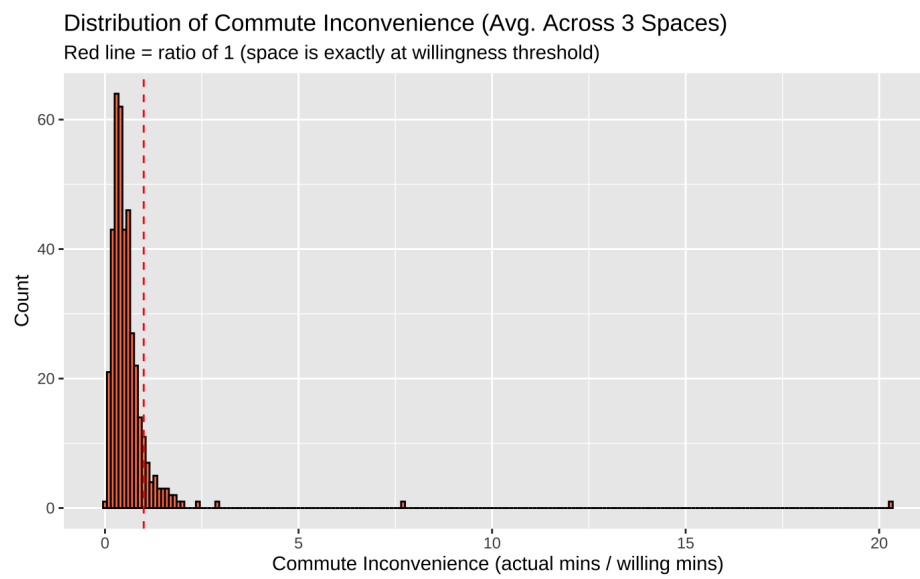


Figure 8: Commute Inconvenience

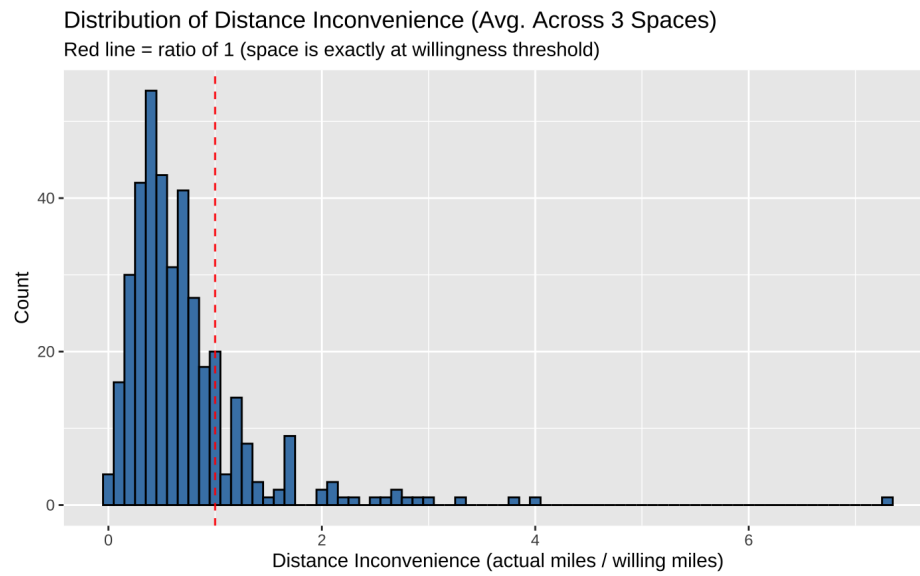


Figure 9: Distance Inconvenience

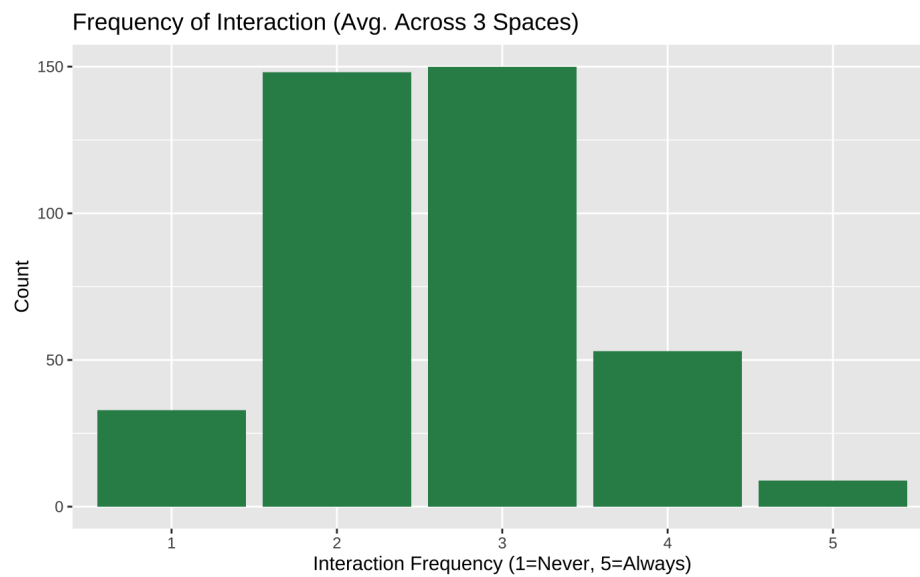


Figure 10: Frequency of Interaction

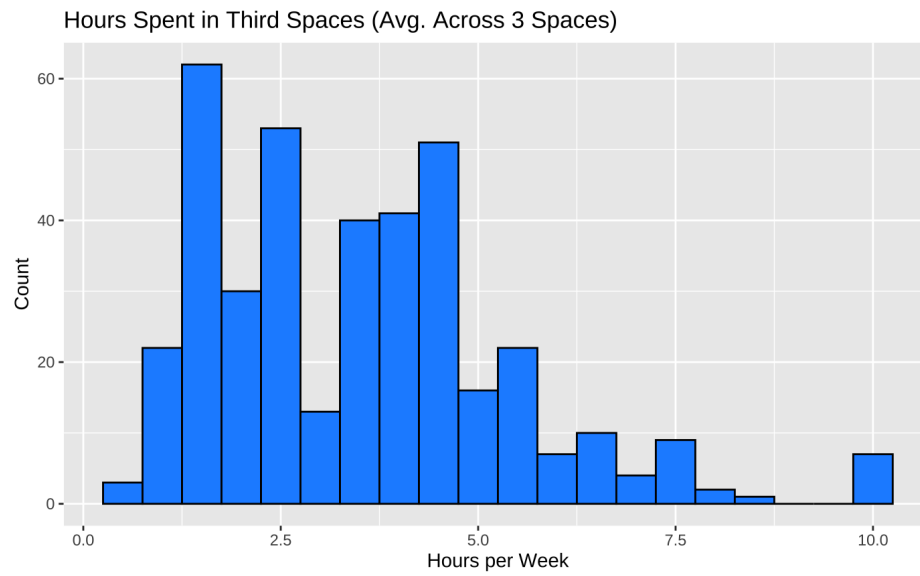


Figure 11: Hours Spent in Third Space

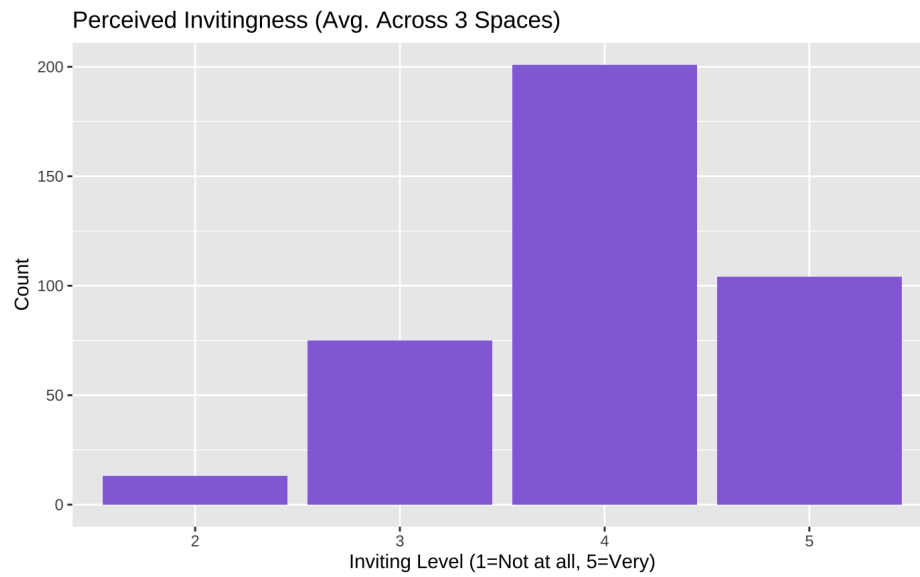


Figure 12: Perceived Invitingness

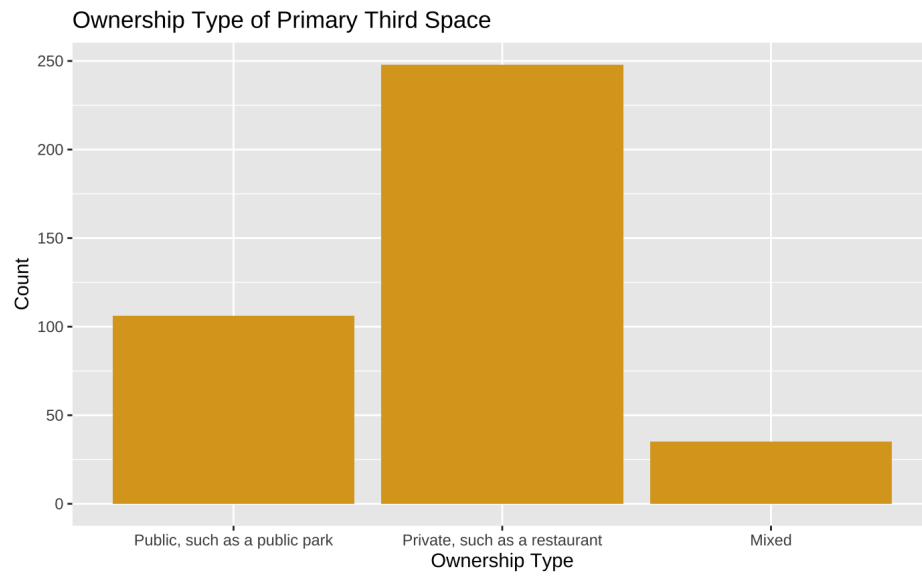


Figure 13: Ownership Type

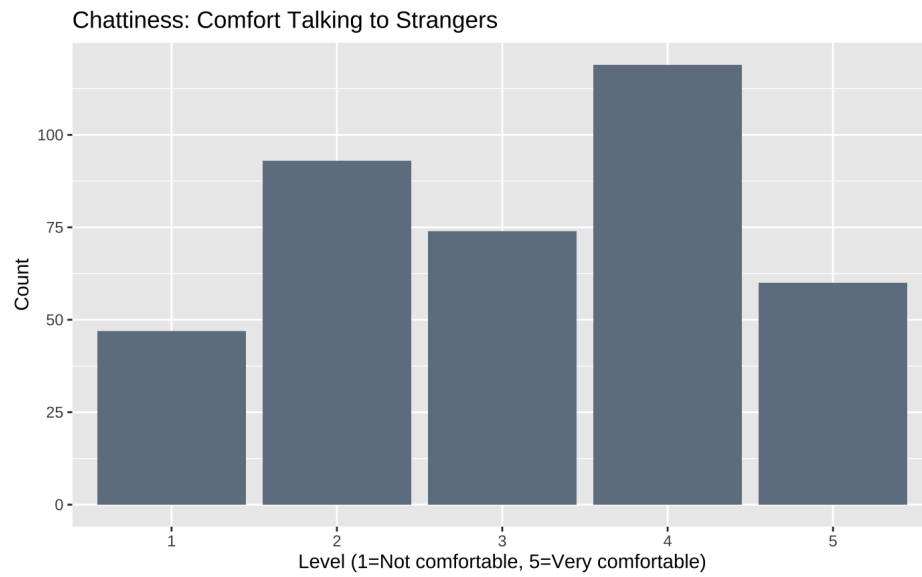


Figure 14: Chattiness Scores