What drives inner city attractiveness for society?

The role of brick and mortar stores.

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Abstract

Inner city centers not only provide opportunities for shopping, dining, and entertainment, but with their lively atmosphere and other vital attributes also create attractive destinations for residents and tourists alike. However, inner city retailing, potentially the most important reason to visit an inner city, is facing serious competition from e-commerce and out-of-town shopping malls. Dying inner city centers have become a severe issue in recent years, worldwide. To counteract this devastating trend and ensure the vitality and viability of inner city centers, stakeholders from the public and private sectors regularly join their forces in initiatives to strengthen urban structures. However, academic insights on the contribution of retailing on perceived city attractiveness remain sparse. Relying on an extensive data set that combines survey and observational data, the authors are able to quantify a variety of inner city characteristics, ranging from its store and service provider portfolio to its ambience and accessibility, and measure their association with its perceived attractiveness. They show that a city's portfolio of retail stores is not only related to people's perceptions of the city's overall attractiveness but also perceptions of its ambience. However, not all retail categories contribute the same way: While the presence of clothing stores or booksellers is strongly associated with cities' ambience as well as attractiveness, other retail categories such as optometrists or electronics stores are negatively associated with consumers' inner city perceptions. Importantly, these relationships also depend on the size of the focal city. Based on their results, the authors provide important managerial and societal implications on how to leverage the local retailing environment to improve inner city attractiveness. For example, the results may inform (local) governments on which sectors to subsidize in order to attract those store and service provider categories that benefit inner city attractiveness.

Introduction

An inner city—often also called downtown, city center, or central business district—is a city's commercial and cultural center that features a large number of shops, offices, and cultural, entertainment, and historic sites (Murphy and Vance 1954). It is usually the nodal point for public transportation and highly frequented by pedestrians. It should be understood as a region with fuzzy, often impermanent edges (Murphy and Vance 1954) that especially outside of the U.S. may comprise of different zones (The Economist 2007). As such, inner cities are at the heart of a city's and sometime region's commercial, societal, and cultural exchanges and touristic activities, and are thus of major economic and societal importance.

However, deteriorating inner city centers have become a worldwide issue, particularly in recent years (Holder 2019; Johnson 2013). The ongoing terminal decline not only reflects in decreasing frequencies of customer visits and resulting sales losses but also increasing numbers of vacant premises as more and more tenants have to go out of business (Der Spiegel 2019), oftentimes raising questions about a city's overall vitality and viability. In England and Wales, for instance, city centers have lost on average 8% of their shops since 2013 (Holder 2019). In Germany, over 11,000 stores have had to close since 2012 (Der Spiegel 2012). The structural changes caused by digitization and the growth of e-commerce (Weltevreden and Van Rietbergen 2007) as well as a rising competition from external shopping malls (Teller 2008) certainly are main contributors to this devastating trend.

Deteriorating inner cities, however, not only constitute a major challenge from the retailing industry's perspective and with regard to residents' local supply but also for a city's ambience and overall attractiveness, both of which are considered important aspects for the local quality of life and the city's ability to provide larger societal value. Inner city attractiveness in this context is understood as peoples' general sentiment towards a city that literally attracts them and manifests in favorable perceptions, attitudes, or patronage behaviors (Teller and Elms 2012). Ambience relates to environmental and atmospheric attributes that

visitors can sense and experience within a city and that create a distinctive urban feel or vibe (Kallström, Persson, and Westergren 2019). These may include visual, olfactory, tactile, and auditory stimuli such as odor, air, light, as well as cleanliness, security, architecture, and the atmosphere as a whole (Hart, Tachow, and Cadogan 2013; Teller and Elms 2012). The ambience thus strongly contributes to the hedonic experience of a city.

To strategically develop the attractiveness and ambience of inner cities and to face the growing competition from online channels and out-of-town shopping malls, stakeholders from a combination of public and private sectors regularly join their forces in so-called "town center management" (TCM) initiatives (De Nisco, Riviezzo, and Napolitano 2008). Retailing, thereby, is constantly at the forefront of TCM's thinking as shopping still remains the number one reason for people to visit the city (IFH 2018). As an example, the German Retail Association (Handelsverband Deutschland (HDE)) just recently proposed a detailed program to the Federal Ministry of the Interior, Building and Community to strengthen German inner city structures (HDE 2019a). Importantly, rather than focusing on place promotion and advertising as key marketing tasks, such initiatives attempt to take advantage of retailing's physical presence to contribute to visitors' and customers' inner city experience in a holistic way. Generally, shopping in a city center offers a unique environment where the out-of-store customer experience complements the in-store customer experience (Källström, Persson, and Westergren 2019). Therefore, concrete measures in TCM initiatives, such as those proposed by the HDE, constitute infrastructural changes to meet retailer requirements, improvements of the urban internet infrastructure to improve customers' omnichannel experience, or extensions to the legal shop opening hours, among other things (HDE 2019b).

However, despite the evident need for structural changes to prevent terminal decline of inner cities, academic insights on the contribution of retail facilities to urban attractiveness remain scarce. Traditionally, most retail research is predominantly focusing on the in-store customer experience (Verhoef et al. 2009), leaving a gap when it comes to understanding the

customer experience where environmental attributes outside of stores play an important part. Only in recent years two streams of research in the marketing literature emerged to pick up on this shortcoming. One stream belongs to the broader place branding domain and focuses on highlighting determinants of marketing-related city performance measures such as residents' satisfaction (Insch and Florek, 2008; Zenker, 2009; Zenker, Petersen, and Aholt 2013), city brand attitude (Merrilees, Miller, and Herrington 2012), place attachment (Insch and Florek 2008), residents' intention to stay (Merrilees, Miller, and Herrington 2009), loyalty (Florek 2011), or city attractiveness (Darchen and Tremblay 2010; De Noni, Orsi, and Zanderighi 2014). The consideration of retailing-related attributes as determinants of city performance, however, remains somewhat neglected.

The second stream of research focuses on highlighting determinants which constitute the attractiveness of retail agglomerations such as inner city centers, shopping streets, and shopping malls (Teller 2008; Teller and Elms 2010, 2012; Teller, Reutterer, and Schnedlitz 2008; Teller et al. 2010). Although characteristics of the local retail infrastructure, such as the tenant mix, experience consideration in most of these studies, this happens on a rather aggregate level and in many cases with only one focal retail agglomeration as object of investigation. Furthermore, questions with regard to retailing's contribution to overall city attractiveness and ambience, which often are at the core of TCM initiatives in practice, are left unanswered in this stream of research. Thus, little is known about what separates attractive from non-attractive cities with respect to the retail store mix—i.e. the portfolio of stores and service providers it offers—or how specific retail categories contribute to visitors' attractiveness and ambience perceptions of a city. To fill these gaps, our study ties into both streams of research and answers the following three foundational research questions:

1) How is an inner city's portfolio of stores and service providers associated with inner city attractiveness?

2) Given the increasing importance of hedonic consumption and shopping motives,

how does the store and service provider portfolio relate to consumers' evaluation of the city's ambience?

3) Are there differences between retail categories and city types?

For this purpose, we rely on data from a large-scale survey conducted by the IFH Köln, a German research institute in the retailing sector, which comprises 111,287 respondents from 174 German cities. We compliment this data with information on city-specific characteristics from the German Federal Statistical Office as well as information on the retail environment for each city which we crawled from the OpenStreetMap (OSM) project. Unlike any other study in this field of research, we are thus able to create a unique and comprehensive data set that covers a large number of cities of varying sizes and that comprises not only a large-scale survey of attitudinal information on peoples' perception of the city they visit but also observational information on key city characteristics. We are thus able to quantify inner cities' characteristics comprehensively and measure their relation to attractiveness.

Our results reveal that a city's portfolio of stores and service providers is not only associated with peoples' perceptions of the city's overall attractiveness but also perceptions of its ambience. Importantly, not all retail categories contribute the same way and some do even depreciate perceived city ambience and/or perceived city attractiveness. As such, clothing, home décor, and book retailers show a particularly positive association while optometrists, electronics, and telecommunications retailers exhibit negative associations. Reasons for that may be seen in the rather hedonic versus utilitarian values these distinct retail categories provide. Additionally, our results indicate that these associations do vary depending on the size of the city. Based on our findings, we provide important implications for stakeholders from public and private sectors on how to leverage specific retail categories with quantity and quality adjustments to improve a city's attractiveness and thus contribute to the quality of life it provides for its citizens.

In the next section, we review relevant literature, which informs the conceptual

framework that underlies our empirical analysis. After specifying our data base and model specifications, we describe and discuss our results according to the stated research questions. We conclude with managerial implications for stakeholders of TCM initiatives and provide directions for future research.

Related Literature

Place branding and inner city attractiveness

The first stream of research our study ties into is the marketing literature focusing on inner city attractiveness which is part of the broader place branding domain. Place branding refers to the application of branding and other marketing strategies to the socio-economic and cultural development of cities, regions, and countries (Ashworth and Kavaratzis 2009). A growing number of studies in this domain explore the perceptions of cities and regions with respect to varying target groups or stakeholders such as residents, tourists, investors, supporters, or entrepreneurs (Merrilees, Miller, and Herrington 2012; Zenker and Martin 2011). Of these various target groups and stakeholders, a city's residents are considered strategically to be the most valuable, because the successful management of their well-being has the potential to make a city attractive and sustainable (Insch and Florek 2008). The challenge on how to "measure" city perceptions such as its attractiveness, however, has been taken up very differently in the existing place branding literature (Zenker 2011). Some studies rely on qualitative methods such as focus groups or in-depth interviews to measure place (brand) associations (e.g., Drachen and Tremblay 2010; Insch and Stuart 2015), while others rely on quantitative methods such as standardized questionnaires to analyze place attributes and different location factors (e.g., Merrilees, Miller, and Herrington 2009; Zenker 2009). Furthermore, extant place branding literature sheds light on many different attitudinal and behavioral outcomes including satisfaction (Insch and Florek, 2008; Zenker, 2009; Zenker, Petersen, and Aholt 2013), city brand attitude (Merrilees, Miller, and Herrington 2012),

attachment (Insch and Florek 2008), intention to stay (Merrilees, Miller, and Herrington 2009), loyalty (Florek 2011), attractiveness (Darchen and Tremblay, 2010; De Noni, Orsi, and Zanderighi 2014), city ambassadorship (Taecharungroj 2016; Zenker and Rütter 2014), city citizenship (Taecharungroj 2016), and word-of-mouth (Zenker and Rütter 2014).

Furthermore, a wide range of varying attributes has been considered that may have an impact on these attitudinal and behavioral outcomes. These can be distinguished into tangible and intangible attributes (Zenker 2011, Parkerson and Saunders 2005). Tangible attributes include perceptions about a city's culture, history, nightlife, shopping, infrastructure, housing, businesses, atmosphere, or ambience, etc. Correspondingly, intangible attributes relate to the cities perceived personality, emotional aspects, or values. Importantly, both tangible and intangible attributes may be subjects to TCM initiatives and thus constitute important competitive marketing instruments.

The studies most related to our study are provided by Merrilees et al. (2018) and Zenker, Petersen, and Aholt (2013). Merrilees et al. (2018) investigate the determinants of city brand attitudes using a survey of 422 participants in Hong Kong. The authors document social bonding, education, job opportunities, and safety to have the largest influence. However, shopping (i.e., wide choice of shopping areas, availability of mid-range shopping malls, interesting street markets) has been found to be important as well. Zenker, Petersen, and Aholt (2013) build up on the American Customer Satisfaction Index (ACSI) (Fornell et al. 1996) and similar metrics to develop the Citizen Satisfaction Index (CSI). The authors consider four basic factors in their scale development, namely urbanity and diversity, which includes the variety of shopping opportunities, nature and recreation, job opportunities, and cost-efficiency. In an empirical validation of their scale based on a survey provided by 160 participants, the authors find the first two to have an impact on citizens' overall satisfaction. Thus, shopping opportunities as part of the factor urbanity and diversity indeed contribute to a city's attractiveness.

Further studies that may be considered related elaborate on city attractiveness as dependent variable, but focus on talents, knowledge workers, and students as target groups rather that citizens or visitors in general. These studies also largely neglect the retailing environment as potential determinants of city attractiveness. As such, Drachen and Tremblay (2010) find varying effects of cultural activities and the quality of urban and natural environments on the attractiveness of two Canadian cities, Montreal and Ottawa. Furthermore, De Noni, Orsi, and Zanderighi (2014) document education to be the most important factor to attract talents while the environmental quality, surprisingly, exhibit negative effects based on a survey conducted in the city of Milan, Italy.

Retail Agglomerations

The second stream of research that our study ties into focuses on the attractiveness of retail agglomerations such as inner city centers, shopping streets, and shopping malls. In contrast to the place branding literature that focuses on e.g., city attractiveness as a whole, studies in this domain consider retailing to be the major element of interest in the urban place brand and an omnipresent feature of the urban environment (Teller and Elms 2012). An intraurban retail agglomeration, such as an inner city, is defined as a "discrete, free standing collection of retail stores and both the privately owned (e.g. merchandise, buildings, signs) and publicly owned elements of their surrounding environment (e.g. roads, car parks, amenities)" (Bell 1999, p. 68). Thus, when shopping in city centers, customers' out-of-store experience constitutes an important complement of their in-store experience (Kallström, Persson, and Westergren 2019) and more generic place attributes may play an important role for how inner city retailing may be perceived as a unique and attractive shopping destination (Kavaratzis 2004).

Consequently, all studies in this stream of research focus on determining attributes of inner city retail agglomerations related to the site itself (e.g., accessibility, parking), the tenants (e.g., mix of retail-/non-retail tenants, gastronomy and entertainment facilities), or the

environment (e.g., ambience or atmosphere, orientation, cleanliness) and their influence on visitors' attractiveness evaluation of the focal retail agglomeration. Thereby, some studies incorporate this relationship with regard to one agglomeration format, such as city centers (e.g., Teller and Elms 2012), while other studies stress the relative importance of environmental attributes for competing agglomeration formats such as city centers versus shopping malls (e.g., Teller 2008; Teller and Elms 2010; Teller, Reutterer, and Schnedlitz 2008;). Furthermore, while some studies rely on a one-dimensional attractiveness measure (e.g., Teller, Reutterer, and Schnedlitz 2008), other studies operationalize attractiveness either as a multidimensional second-order construct (e.g., Teller and Elms 2012; Teller and Reutterer 2008) or directly incorporate measures such as satisfaction, retention proneness, and patronage intention as attractiveness dimensions (e.g., Teller 2008; Teller at al. 2010).

Teller and Reutterer (2008) base their analysis on a survey of more than 2,000 visitors of an inner-city shopping street and a peripheral shopping mall in Vienna (Austria) to investigate the drivers of retail agglomeration attractiveness once the visitors have made their destination choices. The authors furthermore distinguish between overall, sustainable, and situational attractiveness. The results show that tenant related factors, i.e. the retail tenant mix, and environmental related factors, i.e. the atmosphere within the urban destination, have a major impact on distinct dimensions of perceived attractiveness. As an extension of this study, Teller, Reutterer, and Schnedlitz (2008) consider psychographic variables in terms of utilitarian and hedonic shopping orientation, which may affect the perception of retail agglomeration attributes. Based on a sample comprising 2,139 interviewed customers in an inner city shopping street and a peripheral shopping mall in Vienna, the authors document customers who are attracted by retail agglomerations because of atmospheric and price-related attributes typically to be hedonists.

Further studies that incorporate a rather similar set of retail agglomeration attributes, investigate their influence, however, on different attractiveness-related performance measures.

Using a web-based survey of around 1,000 consumers representing a typical urban central European retail agglomeration, Teller (2008) demonstrates for both shopping streets and shopping malls the retail tenant mix and urban atmosphere to have the highest relative importance on visitors' satisfaction and patronage intentions. Teller and Elms (2010) support these findings based on 500 face-to-face interviews of shoppers visiting the center of a mid-size Austrian city. Additionally, the authors stress the importance of the retail tenant mix and the urban atmosphere for visitors' retention proneness. Teller and Elms (2012) contribute by documenting indirect effects of the product range (i.e., breadth, depth, range of brands available) and sales personnel characteristics (i.e., friendliness, competency, readiness to help) on attractiveness measured as second-order construct operationalized by satisfaction, retention proneness, and patronage intention. The authors test their model by surveying around 500 actual customers visiting a particular town center for the purpose of shopping. Finally, Teller and Elms (2010) expand existing insights by focusing on three competing retail agglomeration formats (i.e., a town center, a strip center, and a regional shopping mall). Using survey data of more than 1,000 visitors of the three agglomeration formats in a mid-sized town in Austria, the authors find retail-related factors and the urban atmosphere to influence attractiveness most significantly in each of the three settings. All other factors – particularly convenience-related ones – show only format specific impact or are of no relevance for visitors' attractiveness perceptions.

Conceptual Framework

Our study analyzes how various attributes related to inner cities' portfolio of stores and service providers affect consumers' perceptions of inner city attractiveness. Attractiveness, in general, can be seen as a "multi-faceted construct representing a variety of measures" (Reinartz and Kumar 1999, p. 11). In this context, attractiveness can be understood in its actual sense as the extent to which people are pulled towards a particular urban destination,

manifesting in perceptions, attitudes, or patronage behaviors (Teller and Elms 2012). Similar

to other related studies (e.g., De Nisco and Warnaby 2014; Teller and Elms 2012), we

therefore propose a conceptual framework that relies on Mehrabian and Russell's (1974)

seminal Stimulus-Organism-Response (SOR) model. Thereby, any perceptive, attitudinal, or

behavioral outcomes are affected by the evaluated attractiveness of the focal urban site

(Response). The attractiveness, for its part, is affected by inner city attributes that are

perceived by the place visitors (Organism). Importantly, the perception of inner city attributes

and the evaluation of their attractiveness can be influenced by public and private stakeholders,

for instance by applying specific TCM initiatives (Stimulus). Based on the SOR-model and

existing literature from the place branding and retail agglomeration domain, we consider four

key attributes: the city's (1) store and service provider portfolios, (2) ambience, (3) its

accessibility as well as (4) its size. We elaborate on each of these attributes in the following.

Figure 1 gives an overview of our proposed conceptual framework.

Figure 1: Conceptual Framework
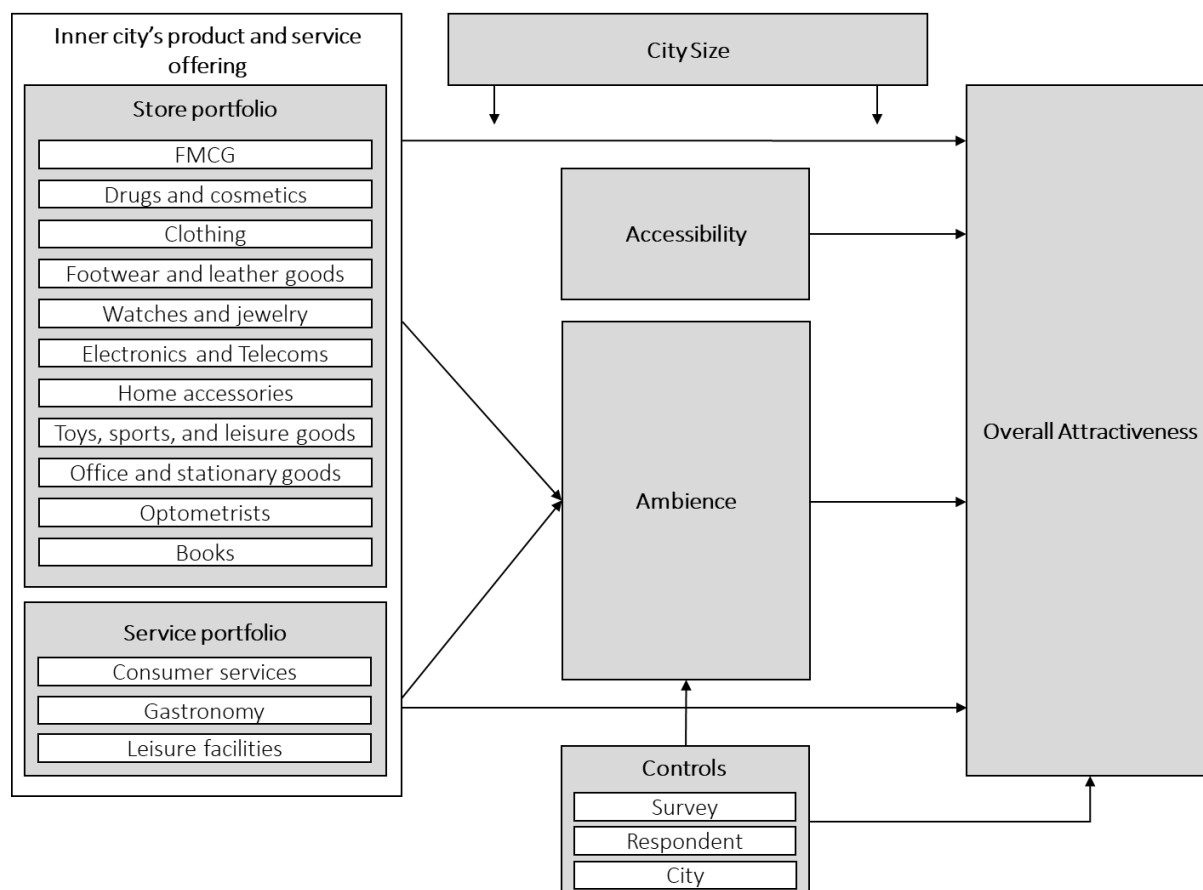
Store and Service Portfolio

Shopping, entertainment, and dining are main reasons to visit a city center. Accordingly, the degree to which visitors can satisfy their wants and needs with regard to these activities is determined by the existence of retail stores, services, entertainment, and gastronomy facilities. Marketing literature demonstrates that exploring new stores provides an intrinsic, hedonic value to shopping (Babin, Darden, and Griffin 1994) and that strolling through large retail agglomerations with a large variety of retail stores and service offerings, such as inner cities and malls, may provide an entertaining, informative, and pleasing shopping experience (Bloch, Ridgway, and Dawson 1994; Jones 1999). For the individual retailer or service provider, a proper tenant mix is of importance because it may shape the success of a retail agglomeration by attracting more visitors and thus increasing sales for the agglomeration as a whole (e.g., Teller and Reutterer 2008). As such, previous empirical studies demonstrate the importance of the "mix" or "variety" of retail and non-retail tenants on inner city retail attractiveness (Teller and Reutterer 2008; Teller et al. 2008) as well as visitors' emotional state that in turn affects purchase-related behavioral outcomes (De Nisco and Warnaby 2014).

Yet, none of these studies consider the individual contribution of specific retailer categories (e.g., FMCG, clothing, books) to visitors' perceptions of city attractiveness. However, we argue that different retailer and associated product categories serve very distinct wants, needs, and ultimately shopping values.

A common approach in the marketing literature is to classify utilitarian and hedonic products, where product categories such as books and music/movie are considered hedonic while e.g., computer hardware and computer software are usually considered utilitarian (e.g., Cheema and Papatla 2010). Utilitarian products are instrumental, inferring a consumption situation that is motivated more by functional aspects (Khan, Dhar, and Wertebroch 2005). Consequently, consumers need to process information related to these products in a more systematic and effortful way (Hirschman and Holbrook 1982; Ratchford 1987). Contrarily,

hedonic products are considered multisensory, providing fun, pleasure, and excitement, so that information on these products need to be processed less systematically and in a more heuristic way that may incur less effort. (Ratchford 1987).

Given that products vary in terms of the hedonic and utilitarian value that they provide and the information processing their shopping requires, we expect the shopping experience for these products to vary as well. This would lead to some categories exercising a stronger/weaker effect on a city's overall attractiveness as well as ambience. This is determined by the focal categories' provision of hedonic or utilitarian values and specific wants and needs that are served during shopping activities in these categories.

Ambience

Ambience (or atmosphere) relates to a group of attributes that visitors can sense and that create a distinctive urban feel or vibe (Kallström, Persson, and Westergren 2019) and thus strongly contributes to the hedonic experience of the city. These may include visual, olfactory, tactile, and auditory stimuli such as odor, air, light as well as cleanliness, security, architecture, and the atmosphere as a whole (Hart, Tachow, and Cadogan 2013; Teller and Elms 2012). Compared to accessibility attributes which are subjects to visitors' cognitive evaluation of the city center's functioning and fulfillment of utilitarian needs (Hart, Tachow, and Cadogan 2013), ambience- or atmosphere-related attributes of a city center generate rather emotional affective responses (Turley and Milliman 2000). The importance of ambience has been documented in the broad marketing literature with regard to different focal objects. On the in-store level, ambience has been shown to influence shopping behavior through its effect on mood (Donovan and Rossiter 1982). On the aggregate retail level, furthermore, ambience has been documented to affect visitors' perceptions of entire inner city retail agglomerations such as shopping streets or shopping malls (e.g., Teller and Elms 2012). Finally, there is evidence with regard to an influence of ambience—or related attributes such as urbanity—on general city attractiveness as well (e.g., Drachen and Tremblay 2010; De

Noni, Orsi, and Zanderighi 2014, Zenker, Petersen, and Aholt 2013). Therefore, we also consider ambience as an important direct influence on inner city attractiveness.

However, the perceived ambience of a city may be subject to influence from other inner city attributes, such as the retail environment, itself. Retail stores and facilities – with their large and often carefully curated shop-windows, facades, signs, employees, and customers they attract – constitute a major physical presence in an urban environment. Thus, stores and service providers influence an inner city's visual and often even auditory and olfactory stimuli. Darden and Barbin (1994) show that retail environments evoke emotional responses such as pleasure, energy, and sleepiness. These emotional responses may tie into the affection a visitor may have regarding the ambience of an urban environment, as in-store and out-of-store experiences become blurred during a shopping trip. Hence, even without visiting a store, consumers are subjected to their many stimuli when visiting an inner city. Therefore, we consider ambience to be a mediating construct as depicted in our conceptual framework.

Accessibility

From a visitor's perspective, the experience to visit an inner city begins with the journey to and continues with the movement within a particular urban destination. Thus, visitors first have to overcome spatial and temporal distances between their place of origin (e.g., home or work place) and the target destination, e.g., to do shopping (Huff 1963). The accessibility of an inner city, therefore, indicates the degree of (in-) convenience that is entailed with this journey. Given the popularity of cars as major individual means of transportation in western populations (Baker 2002), the efficiency to go by car and the adequacy of parking possibilities can be regarded as major factors enhancing the convenience to visit a destination (De Nisco, Riviezzo, and Napolitano 2008). Additionally, the availability of public transportation and practicability to use a bicycle may be further important factors, particularly in larger cities. Besides factors related to the transportation to and within an urban destination, store opening hours may further contribute to the convenience associated with an inner city

visit and be particularly related to its temporal accessibility (Bell 1999). Accessibility has been shown to be of particular importance for shoppers' evaluations of urban retail agglomerations (e.g., Teller 2008; Teller and Reutterer 2008).

Data and Methodology

Data

We base our analysis on a large-scale survey conducted by the IFH Köln. The face-to-face surveys were conducted with pedestrians in 181 German inner cities of varying population size in four different weeks in 2016 and 2017. This has resulted in a total of 115,530 observations. The participants were asked to evaluate the respective inner city across a variety of dimensions, such as its overall attractiveness, its ambience as well as the attractiveness of its stores and service providers in a total of 14 different retail categories such as clothing, footwear, and gastronomy.

We complement this data set with publicly available data from the German Federal Statistical Office, which allows us to control for city-specific factors such as population size and unemployment rates in our analysis.

The resulting data set forms the basis of the first part of our analysis and is comprised of 174 cities and a total of 111,287 observations which are divided rather uniformly across the different city sizes as shown in Table 1.

Table 1 – Number of observations across city sizes

Population Size	Number of Cities	Number of Respondents
< 50,000	96	38,254
50,000 – 100,000	39	27,106
100,000 – 500,000	29	28,109
> 500,000	10	17,818
Total	**174**	**111,287**

Of the 174 cities, 51 have been surveyed in both years, 2016 and 2017. As a longitudinal study is not feasible due to the rather short time frame and the limited number of cities surveyed in both years, we combine both years in a cross-sectional data set treating observations from the same city in two different year as if they came from separate cities. In this way, we maximize the number of cities in our data set. Alternative model specifications that we have tested, e.g., only considering the most recent survey year, do not lead to systematically different results.

For the second part of our analysis, we further complement this data set with information on the actual quantity of stores and service providers in each sector for each city. For this, we crawled data form the OpenStreetMap project. OSM is an open source collaborative mapping counterpart to services such as google maps. Its large contributor base feeds the database with location information on stores, landmarks, public buildings, and many more. Using the service overpass turbo, we crawled the OSM database in terms of store data for individual cities. The resulting data set includes the store name, its location in longitude and latitude as well as the category it operates in. We match the OSM-specific sector identifiers to the 14 categories surveyed in the IFH study and, thus, end up with the number of stores in each of the IFH categories for each of the cities. We are able to collect this type of data for all but two of the 174 cities from our IFH survey sample identifying a total of 122,460 unique stores of which 102,887 fall in one of our 12 IFH store categories (excluding gastronomy and leisure facilities for which we could not extract reliable data).

The OSM data represents a snapshot of cities' store and service provider portfolio from the first quarter in 2020 when the crawling took place. Accordingly, there is a temporal mismatch with the surveys, which have been conducted in 2016 and 2017. However, an inner city's store landscape is reasonably static, especially when aggregated on a retail category level so that we do not assume that this mismatch will bias our results. In addition, much of an inner city's dynamics in its store and service provider portfolio is drive by macro factors such

as the general pressure through new technologies and e-commerce or an aging population so that these would affect the entire sample of cities in our sample.

Our multimethod approach to data collection results in a comprehensive data set that is unique to studies in this field that exhaustively describes a large number and variety of German inner cities. While the large-scale IFH survey gives us insights into consumers personal perceptions of inner cities attractiveness and its various components, the OSM data gives us a quantitative evaluation of each inner cities store and service portfolio. At the same time, we are able to control for city-specific economic, social, and demographic factors based on the data derived from the German Federal Statistical Office.

Operationalization

The IFH survey data provides us with a large variety of measures on consumers' perceptions of the respective inner city. The respondents were asked to rate the inner city in terms of its overall attractiveness as well as the attractiveness of its store and service portfolio across a total of 15 measures, specifically in terms of:

- consumer service providers (e.g. hair dressers, dry cleaners), leisure facilities (e.g. museums, (movie) theaters, pools), and gastronomy – which together represent the city's service provider portfolio,

- separate measures for the perceived store portfolio attractiveness for 11 categories – clothing, footwear and leather goods, jewelers, electronics and telecommunications, home décor, stationeries, leisure and sports goods, optometrists, booksellers, drugs and cosmetics, and groceries,

- respondents' aggregate perception of store portfolio attractiveness.

In addition, respondents rated inner cities regarding their accessibility by public transport, car, availability of parking, and its opening hours of stores and services, as well as their ambience with measures on overall ambience, buildings, squares and parks, landmarks, cleanness, safety, and liveliness. Respondents rated each of these attractiveness measures

using grades from the German school system, which allowed for intuitive responses from survey participants. While in the original system 1 stands for the best grade and 6 for the worst, we reversed this scale in order to allow for easier interpretation of coefficients.

On top of the attractiveness measures, the IFH survey provides demographic information on each respondent in terms of age, gender, whether they are a resident of the respective city or not, and how often they tend to visit the city for shopping. In addition, further control variables on the year, week, and weekday the survey was conducted on enter our models. For each of the survey questions a no response option was provided. We treat the resulting missing values by mean imputation for the respective city and year.

We further complement our data set with data from the German Federal Statistical Office on each city's population size, average citizen age, number of unemployed citizens, and ratio of recreational versus residential area as well as the crawled OSM data on the number of stores in each of the focal store and service categories (excluding leisure facilities and gastronomy). We present an overview of all variables, their sources, and operationalizations in Table 2.

Methodology

We build up our analysis in two stages as presented in Table 3, which presents the various model (component) specifications.

In stage one, we establish the association between a city's aggregate store and service provider portfolios with its attractiveness. For this, we first use a linear ordinary least squares (OLS) that regresses respondents' aggregate perception of a city's store portfolio as well as its average perception across service providers on attractiveness. We control for ambience components, accessibility factors, as well as the set of respondent-, survey- and city-specific control variables. The formal model specification is provided in Table 3, Model 1a.

Table 2 – Overview of data sources, variables, and operationalization

Data Source	Variable group	Variable(s)	Operationalization
IFH survey	Overall inner city attractiveness (*Attrac*)	Overall inner city attractiveness	Scale 1-6
	Store portfolio (*StorePort*)	Overall store portfolio	Scale 1-6
	Store categories (*StoreCategSt*)	Clothing, Footwear and leather goods, Jewelers, Electronics and telecommunications, Home décor, Stationeries, Leisure and sports goods, Optometrists, Booksellers, Drugs and cosmetics, Groceries	Scale 1-6
	Service provider portfolio (*ServPort*)	Overall service provider portfolio	Average across service provider categories
	Service provider categories (*ServCateg^{Sv}*)	Consumer services, Leisure facilities, Gastronomy	Scale 1-6
	Overall Ambience (*Amb*)	Overall ambience	Scale 1-6
	Ambience components (*AmbComp^{Am}*)	Buildings and facades, Squares and Parks, Landmarks, Cleanliness, Safety, Liveliness	Scale 1-6
	Accessibility (*Access^{Ac}*)	By public transport, By car, Parking, Opening hours	Scale 1-6
	Respondent controls (*RespCtrl^{Re}*)	Age	Numeric
		Gender	Dummy
		Resident	Dummy
		Shopping visit frequency	Scale 1-5
	Survey Controls (*SurvCtrl^{Su}*)	Year	Dummy
		Week	Dummy
		Day of the week	Dummies
German Federal Statistics Office	City controls (*CityCtrl^{Ci}*)	Population size	Logged
		Average age	Numeric
		Number of unemployed residents	Per capita
		Ratio of recreational to residential area	Percentage ratio
OpenStreetMap crawling	Service provider quantity (*ServQuant*)	Number of service providers	
	Store category quantity (*StoreQuant^{StQ}*)	Number of clothing stores, footwear and leather goods stores, jewelers, electronics and telecommunications stores, home décor stores, stationery shops, leisure and sports goods stores, optometrists, booksellers, drug and cosmetic stores, and groceries stores	Per 1,000 inhabitants

Note: Names of variables / vector of variables in parentheses.

Table 3 – Overview of model (component) specifications

Stage 1 – Aggregate store and service provider portfolio analysis

1a) OLS

$$Attrac_i = \alpha + \beta_1 StorePort_i + \beta_2 ServPort_i + \sum_{Am=1}^{Am} \beta_3^{Am} AmbComp_i^{Am} + \sum_{Ac=1}^{Ac} \beta_4^{Ac} Access_i^{Ac} + \Gamma * Control_i + \varepsilon_i$$

1b) SEM

$$StoreCateg_i^{St} = \alpha^{St} + \delta^{St} StorePortfolio_i + \varepsilon_i^{St}$$

$$StorePortfolio_i = \Gamma^{St} * Control_i + \varepsilon_i^{StP}$$

$$ServCateg_{Sv_i} = \alpha^{St} + \delta^{Sv} ServicePortfolio_i + \varepsilon_i^{Sv}$$

$$ServicePortfolio_i = \Gamma^{Sv} * Control_i + \varepsilon_i^{SvP}$$

$$AmbComp_i^{Am} = \alpha^{Am} + \delta^{Am} Ambience_i + \varepsilon_i^{Am}$$

$$Ambience_i = \omega_1 StorePortfolio_i + \omega_2 ServicePortfolio_i + \Gamma^A * Control_i + \varepsilon_i^A$$

$$Attrac_i = \alpha + \delta_1 Attractiveness_i + \varepsilon_i^{At}$$

$$Attractiveness_i = \beta_1 Ambience + \beta_2 StorePortfolio_i + \beta_3 ServicePortfolio_i + \sum_{Ac=1}^{Ac} \beta_4^{Ac} Access_i^{Ac} + \Gamma * Control_i + \varepsilon_i$$

$$Control_i = \sum_{Re=1}^{Re} RespCtrl_i^{Re} + \sum_{Su=1}^{Su} SurvCtrl_i^{Su} + \sum_{Ci=1}^{Ci} CityCtrl_C^{Ci}$$
with Γ as a vector of coefficients with equal length to $Control$

Stage 2 – Category-specific store and service provider portfolio analysis

2a) OLS

$$Attrac_i = \alpha + \sum_{St=1}^{St} \beta_1^{St} StoreCateg_i^{St} + \sum_{Sv=1}^{Sv} \beta_4^{Sv} ServCateg_i^{Sv} + \sum_{Am=1}^{Am} \beta_3^{Am} AmbComp_i^{Am} + \sum_{Ac=1}^{Ac} \beta_4^{Ac} Access_i^{Ac} + \Gamma * Control_i + \varepsilon_i$$

2b) Multilevel SEM

Within-level

$$Amb_i = \alpha^{Am} + \sum_{St=1}^{St} \beta_1^{St} StoreCateg_i^{St} + \sum_{Sv=1}^{Sv} \beta_2^{Sv} ServCateg_i^{Sv} + \Gamma_1^{Sv} * Control_i + \varepsilon_i^{Am}$$

$$Attrac_i = \alpha^{At} + \beta_3 Amb_i + \sum_{St=1}^{St} \beta_4^{St} StoreCateg_i^{St} + \sum_{Sv=1}^{Sv} \beta_5^{Sv} ServCateg_i^{Sv} + \sum_{Ac=1}^{Ac} \beta_6^{Ac} Access_i^{Ac} + \Gamma_1^{At} * Control_i + \varepsilon_i^{At}$$

$$Control_i = \sum_{Re=1}^{Re} RespCtrl_i^{Re} + Week_i + \sum_{D=1}^{6} Day_i^D$$

Between-level

$$\overline{Amb}_i = \omega^{Am} + \sum_{St=1}^{St} \delta_1^{St} \overline{StoreCateg}_i^{St} + \sum_{Sv=1}^{Sv} \delta_2^{Sv} \overline{ServCateg}_i^{Sv} + \Gamma_2^{Sv} * Control_C + \varepsilon_i^{Am}$$

$$\overline{Attrac}_i = \omega^{At} + \delta_3 \overline{Amb}_i + \sum_{St=1}^{St} \delta_4^{St} \overline{StoreCateg}_i^{St} + \sum_{Sv=1}^{Sv} \delta_5^{Sv} \overline{ServCateg}_i^{Sv} + \Gamma_2^{At} * Control_C + \varepsilon_i^{At}$$

$$Control_C = \sum_{Ci=1}^{Ci} CityCtrl_C^{Ci} + Year_C$$

2c) +Quantity

$$+\delta_6 ServQuant_C + \sum_{StQ=1}^{StQ} \delta_7^{StQ} StoreQuant_C^{StQ}$$

Note: Subscript *i* corresponds to individual-level observations, *c* to city-level observations

Next, we specify a structural equation model (SEM) which we estimate using the R-package *lavaan* (Rosseel 2012). We present the individual model components in Table 3, Model 1b. The specified SEM captures our conceptualized mediation through ambience and, in addition, analyzes to which degree the different store and service provider categories contribute to consumers' perception of a city's aggregate retail portfolio. Thus, store and service provider portfolios (*StorePortfolio*, *ServicePortfolio*) are specified as reflective constructs defined by respondents' evaluations of the various store (*StoreCateg*) and service provider categories (*ServCateg*). These latent constructs affect ambience (*Ambience*), which in turn is a reflective construct described by respondents' evaluation of the various ambience components (*AmbComp*). Finally, *Ambience* and the latent store and service provider portfolio constructs *StorePortfolio* and *ServicePortfolio* exercise an effect on the reflective latent construct *Attractiveness*, which is described by a single measure, namely respondents' overall perception of an inner city's attractiveness (*Attrac*). In each level of the model, we control for the same set of respondent, survey, and city variables (*Control*) as in Model 1a. Besides the direct effects of the store and service provider portfolios on ambience and attractiveness, we use 5,000 bootstraps to uncover the corresponding indirect and total effects. Finally, we also analyze the proposed moderation by city size by using a split sample approach in order to circumvent multicollinearity issues through the inclusion of interaction effects.

In stage two, having established the associations on an aggregate level, we consider the store and service provider categories individually. In this way, we can determine whether there are differences among these categories in terms of their associations with ambience and attractiveness. This, in turn, carries important implications for officials and managers in determining which categories are the strongest driver of inner city attractiveness from a consumer perspective. Again, we first use a simple linear model with attractiveness as the dependent variable and replacing the aggregate store and service provider portfolio evaluations from step 1 with the evaluations for each of the 14 store and service provider

categories (Model 2a).

Subsequently, we chose a multilevel SEM to better reflect the underlying data structure of a large number of survey respondents nested in a multitude of different cities (Model 2b). Thus, at the lower level, we model a within-city model that captures the city-specific variances in respondents' survey responses and a higher-level model for between city variances.

By differentiating between the within- and between-city perspectives, we do not only adequately reflect the data structure but also are able to isolate individual consumers' differences from systematic differences between cities. The within perspective reveals which factors relate to consumers' perception of an inner city's ambience and attractiveness, and, thus, through which categories a city can improve its ambience and attractiveness perceptions. The between perspective shows which factors relate to a city's ambience and attractiveness in comparison to other cities and, thus, indicates on which categories a city should compete with other cities.

Accordingly, different variables enter each level of the model. The various individual-level survey responses enter the lower-level model, whereas the city-specific control variables such as population size are included in the higher-level model. Additionally, we calculate the average evaluations of each store ($\overline{StoreCateg}$) and service provider category ($\overline{ServCateg}$), ambience ($\overline{Amb}$), and overall attractiveness ($\overline{Attrac}$) for each city and include them in the higher-level model to analyze how they drive differences across cities. Instead of using latent constructs for attractiveness and ambience as in Model 1b, we resort to using the single-item "overall" measures as dependent variables for a more parsimonious and better fitting model.

In Model 2c, we further complement the higher-level model with the number of stores per city that we crawled from OSM in order to juxtapose the *quality* and *quantity* effects of a city's store and service provider categories.

Results

Descriptives

The following descriptives provide us with some first insights into the German inner city landscape. In Figure 2, we order and plot cities based on their average overall attractiveness, ambience as well as store and service provider portfolio evaluations. Overall attractiveness and ambience are evaluated rather positively with a mean of $\mu_{Attrac} = 4.450$ but vary considerably among cities ($min_{Attrac} = 3.507$, $max_{Attrac} = 5.192$) and $\mu_{Amb} = 4.569$ ($min_{Amb} = 3.538$, $max_{Amb} = 5.383$). For store portfolio attractiveness ($\mu_{Store} = 4.392$), the range of average evaluations is

even wider with $min_{Store} = 2.629$ and $max_{Store} = 5.305$ while the service provider portfolio is perceived more uniformly across cities ($\mu_{Service} = 4.446$, $min_{Service} = 3.340$, $max_{Service} = 5.138$).

Figure 2 – Average inner city evaluations and standard deviations across cities
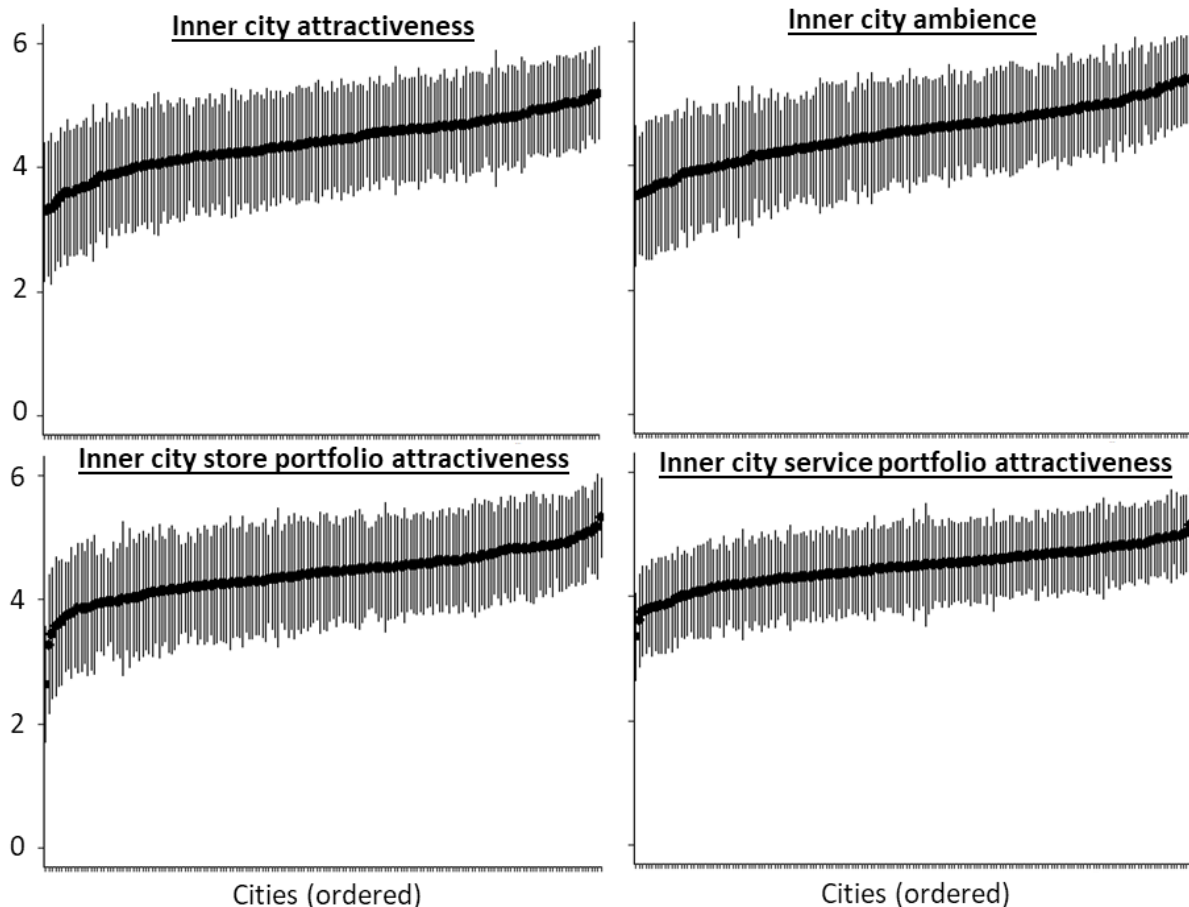
Note: Ordered means and standard deviations of evaluations per city.

Figure 3 displays the distribution of the average store and service category attractiveness across cities. While optometrists, booksellers, and drugs and cosmetics stores as well as consumer service providers and gastronomy are evaluated most positively on average, electronics and telecommunications, home décor, and optometrists are perceived the worst. Nonetheless, the average evaluations are rather high across all categories with none of the medians being below 4.

Figure 3 – Distribution of average store/service category attractiveness across cities
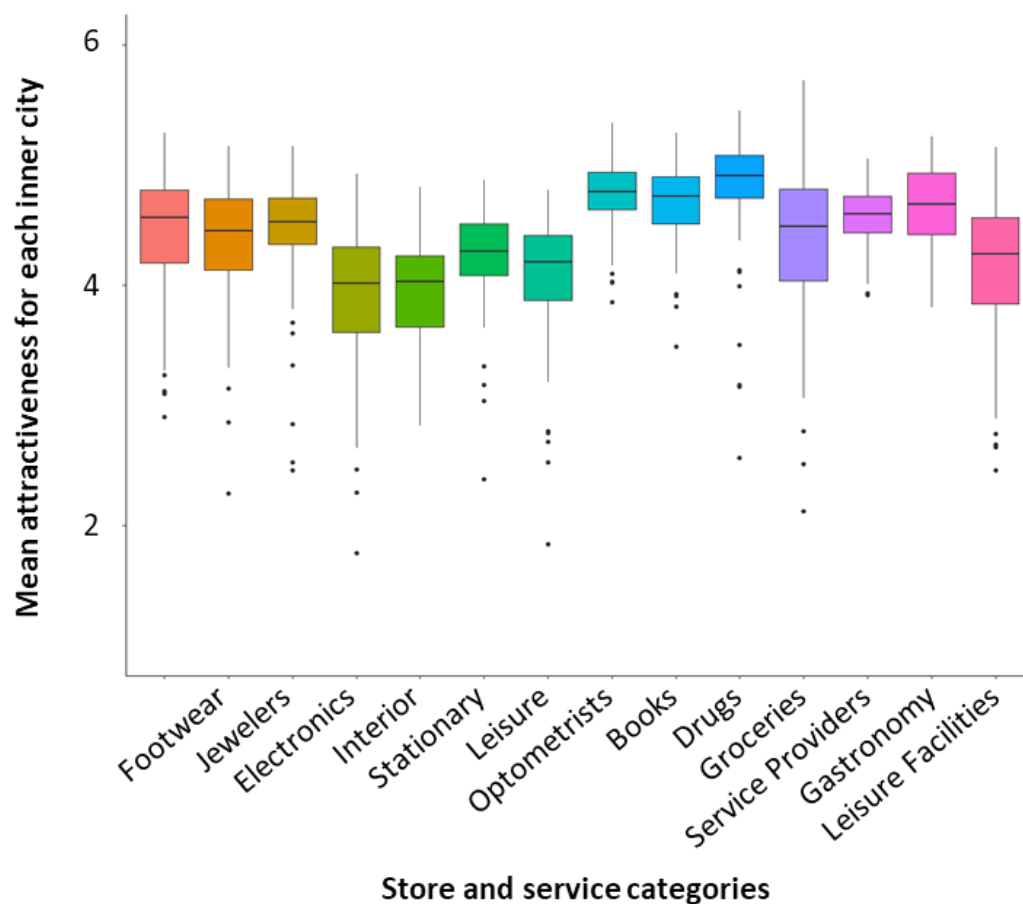
Note: Horizontal bars represent the median, boxes the range from 25th to 75th percentiles, and whiskers the 1.5*inter-quartile range.

In Figure 4, we analyze the cumulative distribution functions for the quantity of stores per capita in each category across all cities. As evident from the flatter slope, grocery stores, service providers, home décor, and clothing stores are rather common in inner cities, while bookseller, stationery shops, jewelers, drugs and cosmetics stores, and optometrists are rare in comparison.

Figure 4 – Cumulative distribution of number of stores in each store/service category
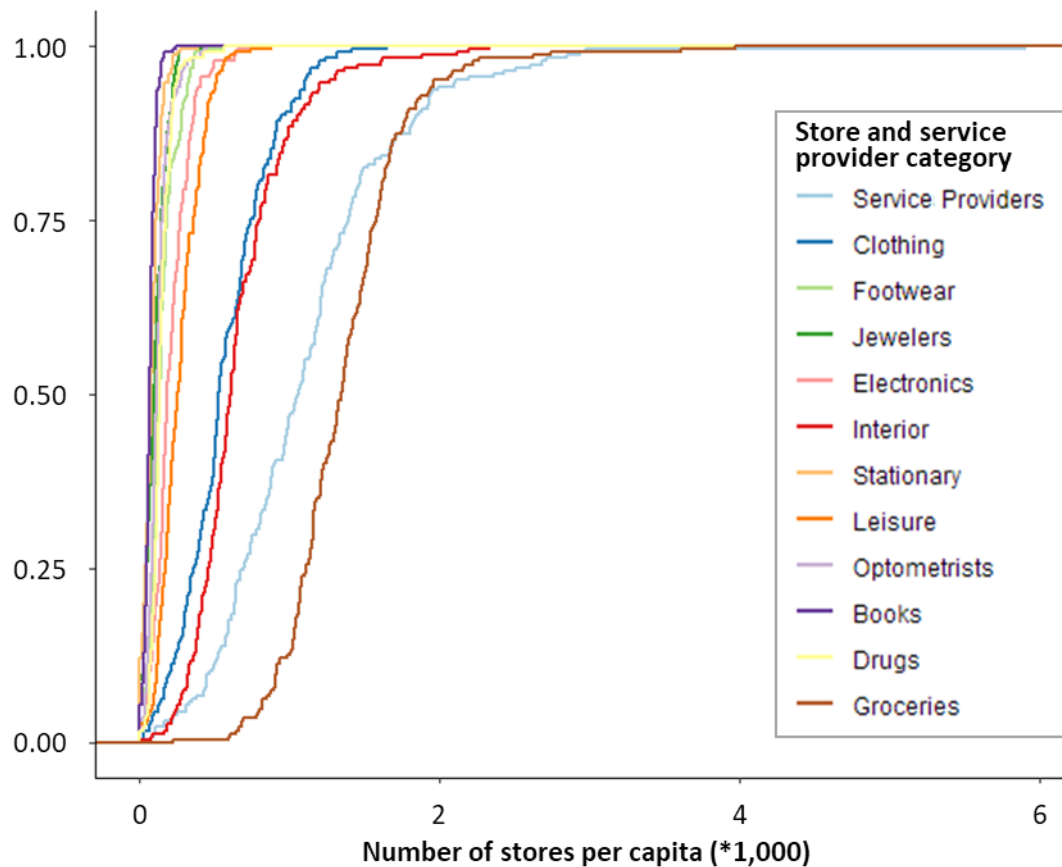
Effects of aggregate store and service portfolios on ambience and attractiveness

Table 4 presents the results from Model 1a which regresses aggregate level perceptions of a city's store and services portfolios on inner city attractiveness.

We find a significantly positive coefficient for both variables ($\beta_{store} = 0.149$, $p_{store} < 0.001$; $\beta_{services} = 0.127$, $p_{services} < 0.001$). Compared with the other survey variables, these parameters are among the strongest in driving inner city attractiveness, comparable in effect size with a city's perceived liveliness ($\beta_{liveliness.} = 0.129$, $p_{liveliness} < 0.001$), as well as its ambience through buildings and facades ($\beta_{buildings} = 0.174$, $p_{buildings} < 0.001$). This speaks to our fundamental assumption that a cities commercial landscape is strongly associated with the overall attractiveness of an inner city and is crucial for consumers even in times of ubiquitous online commerce.

Table 4 – Aggregate-level OLS regression on inner city attractiveness (Model 1a)

Variable Group	Variable	Estimate	SE	Unique	Shared	Mediation
				Variance explained (%)		
	Intercept	-0.367	0.094 ***			
Service provider portfolio	Service attractiveness	0.127	0.004 ***	0.585***	16.666	*3.199*
Store portfolio	Store attractiveness	0.149	0.003 ***	1.399***	16.181	*3.333*
Ambience	Buildings	0.174	0.003 ***	2.003***	19.027	
	Squares and parks	0.074	0.003 ***	0.391***	14.515	
	Landmarks	0.056	0.002 ***	0.303***	14.652	*13.624*
	Cleanness	0.080	0.003 ***	0.488***	11.166	
	Safety	0.031	0.003 ***	0.079***	8.801	
	Liveliness	0.129	0.003 ***	1.255***	18.122	
Accessibility	By public transport	0.059	0.002 ***	0.351***	5.497	
	By car	0.034	0.003 ***	0.091***	2.036	
	Parking	0.033	0.002 ***	0.123***	1.873	
	Opening hours	0.018	0.002 ***	0.041***	3.926	
Respondent controls	Age	-0.001	0.000 ***	0.031***	0.104	
	Gender	0.011	0.005 *	0.003	-0.002	
	Resident	-0.024	0.005 ***	0.012***	0.250	
	Shopping visit frequency	-0.004	0.002	0.002	0.207	
City controls	Population size	0.028	0.003 ***	0.051***	1.790	
	Average age	0.008	0.002 ***	0.014***	0.398	
	Unemployment	-4.118	0.232 ***	0.173***	0.184	
	Leisure vs. resident. area	0.085	0.010 ***	0.042***	1.029	
Survey Controls	Year	-0.025	0.005 ***	0.014***	0.316	
	Week	0.040	0.004 ***	0.042***	0.106	
	Tuesday	-0.010	0.012	0.000	0.102	
	Wednesday	0.014	0.013	0.001	-0.001	
	Thursday	0.017	0.013	0.001	0.004	
	Friday	0.029	0.013 *	0.003	0.025	
	Saturday	0.058	0.015 ***	0.008**	0.084	
	Sunday	0.029	0.047	0.000	0.003	

Model fit: Adjusted R^2 = 0.390; F-statistic = 2,540 on 28 and 111,258 degrees of freedom, $p < 0.01$
*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$ for this an all following tables and figures.

Given our large data base, the highly significant results may be largely driven by the high number of observations (Lin, Lucas, and Shmueli 2013). Thus, for additional robustness, we also estimate measures for effect sizes in Table 4 in terms of each variable's variance explained. The unique variances explained (squared semi-partial correlation coefficients) for our focal variables remain significant and, along with its perceived liveliness and attractiveness of its buildings and facades, explain the largest part of the variance.

Interestingly, however, while the coefficients of store and service provider attractiveness are rather close, the unique variance explained by stores is considerably larger than that of service providers.

As we assume ambience to play a mediating role, we also estimate the size of the mediated effect through a city's overall perceived ambience. This is estimated in terms of the variance in the dependent variable explained jointly by the independent variable and the mediator (MacKinnon 2008). When accounting for this mediated effect, the variance explained by service providers and stores increases by 3.199% and 3.333%, respectively. Overall ambience accounts for 13.624% of the variation in inner city attractiveness. Finally, we also provide the shared variance explained, that is, the variance in the dependent variable explained by the respective variable jointly with other variables. This commonality analysis is especially relevant in our case as the model features a variety of related variables that are correlated with each other (Kraha et al. 2012). The large shared portion of variance explained of 16.666% for service providers and 16.181% for stores further substantiates their relevance in explaining the variance in a city's perceived overall attractiveness.

Next, we present the results from Model 1b, which introduces ambience as a partial mediator as well as the individual store and service provider categories and their effect on consumers' (latent) aggregate retail portfolio perceptions in a SEM specification.

As evident from the standardized coefficients presented in Table 5, all categories load positively and significantly on the latent factors albeit with varying strength. In the context of service providers, leisure facilities load most strongly on the latent factor. In the context of stores, optometrists, grocery stores, and drugs and cosmetics stores load considerably less strongly on the latent factor than stores for clothing or footwear and leather goods.

The coefficients for the model reveal that both, the service provider as well as store portfolio, significantly and positively influence ambience ($\beta_{services} = 0.542$, $p_{services} < 0.001$; $\beta_{stores} = 0.399$, $p_{stores} < 0.001$) as well as the overall perceived inner city attractiveness directly

($\beta_{services} = 0.059$, $p_{services} < 0.001$; $\beta_{stores} = 0.052$, $p_{stores} < 0.001$). Ambience, in turn, exercises a strong effect on perceived attractiveness ($\beta_{ambience} = 0.529$, $p_{ambience} < 0.001$). The corresponding indirect and total effects for both variables on attractiveness mediated by ambience are positive and highly significant, too. Comparing the size of the standardized coefficients, we see that while ambience exercises the strongest effect on inner city attractiveness, it is closely followed by the total effect of the service provider ($\beta_{services} = 0.346$, $p_{services} < 0.001$) and store portfolio ($\beta_{stores} = 0.263$, $p_{stores} < 0.001$).

Table 5 – Aggregate-level SEM results (Model 1b)

Latent factor loadings (standardized)			Regression results (standardized)		
Latent factor~ **Variable**	**Estimate**	**SE**	*DV~* **Variable**	**Estimate**	**SE**
Service provider portfolio			*Ambience~*		
Consumer services	0.373		Store portfolio	0.399	0.004 ***
Gastronomy	0.593	0.021 ***	Service provider portfolio	0.542	0.018 ***
Leisure facilities	0.724	0.037 ***	*Attractiveness~*		
Store portfolio			Ambience	0.529	0.009 ***
Clothing	0.716		Store portfolio	0.052	0.005 ***
Footwear	0.736	0.003 ***	Service provider portfolio	0.059	0.019 ***
Jewelry	0.683	0.004 ***	Access. public trans.	0.075	0.003 ***
Electronics	0.636	0.006 ***	Access. car	0.046	0.003 ***
Home décor	0.585	0.006 ***	Parking	0.040	0.002 ***
Stationery	0.565	0.006 ***	Opening hours	0.028	0.002 ***
Leisure	0.645	0.006 ***	*Indirect paths*		
Optometrists	0.415	0.006 ***	Store portfolio	0.211	0.004 ***
Books	0.547	0.005 ***	Service provider portfolio	0.287	0.017 ***
Drugs	0.498	0.005 ***	*Total paths*		
Groceries	0.310	0.007 ***	Stores portfolio	0.263	0.005 ***
Ambience			Service provider portfolio	0.346	0.020***
Buildings	0.668				
Squares & parks	0.603	0.005 ***			
Landmarks	0.605	0.007 ***			
Cleanness	0.520	0.006 ***			
Safety	0.470	0.006 ***			
Liveliness	0.557	0.007 ***			
Attractiveness					
Attractiveness	1.000				

Model fit: CFI = 0.729; RMSEA = 0.064, SRMR = 0.076

Next, we turn to the proposed moderation of a city's size. We use a split sample approach to avoid multicollinearity issues differentiating between small cities with a population of less

than 100,000 and large cities with more than 100,000 inhabitants.

As presented in Table 6, the effects of ambience and the various accessibility factors are almost identical in the two samples. The effects of the store and service provider portfolios, however, differ quite substantially in small versus large cities. The service provider portfolio is related more strongly to ambience in smaller cities. Also, service providers' and stores' direct effects on inner city attractiveness are considerably larger in small compared to large cities with the coefficient for store portfolios in large cities even being statistically insignificant.

The heterogeneity among store and service provider categories

Having established the general effect as well as the mediation and moderation in the aggregate setting, we now analyze the 11 different store and 3 different service provider categories individually. As argued above, we expect the categories to be heterogeneous in their effect on inner cities' ambience as well as overall attractiveness.

Table 6 – Aggregate-level SEM (Model 1b) on split sample for small and large cities

Small cities (< 100,000)			Large cities (> 100,000)		
DV~ Variable	Estimate (std.)	SE	*DV~* Variable	Estimate (std.)	SE
Ambience~			*Ambience~*		
Store portfolio	0.390	0.005 ***	Store portfolio	0.365	0.008 ***
Service provider portfolio	0.557	0.019 ***	Service provider portfolio	0.434	0.016 ***
Attractiveness~			*Attractiveness~*		
Ambience	0.484	0.013 ***	Ambience	0.570	0.012 ***
Store portfolio	0.081	0.007 ***	Store portfolio	0.012	0.010
Service provider portfolio	0.089	0.023 ***	Service provider portfolio	0.036	0.017 ***
Access. public trans.	0.067	0.003 ***	Access. public trans.	0.084	0.005 ***
Access. Car	0.043	0.004 ***	Access. car	0.040	0.004 ***
Parking	0.038	0.003 ***	Parking	0.044	0.004 ***
Opening hours	0.031	0.003 ***	Opening hours	0.023	0.004 ***
Indirect paths			*Indirect paths*		
Store portfolio	0.189	0.005 ***	Store portfolio	0.208	0.008 ***
Service provider portfolio	0.269	0.017 ***	Service provider portfolio	0.248	0.014 ***
Total paths			*Total paths*		
Store portfolio	0.269	0.007 ***	Store portfolio	0.220	0.010 ***
Service provider portfolio	0.359	0.022 ***	Service provider portfolio	0.284	0.018 ***
Model fit: CFI = 0.730; RMSEA = 0.063, SRMR = 0.079			CFI = 0.752; RMSEA = 0.061, SRMR = 0.070		

Again, we start out with a simple linear model, Model 2a, to establish the total effects as depicted in Table 7.

Table 7 – Category-level OLS regression on inner city attractiveness (Model 2a)

Variable group	Variable	Estimate	SE	Variance explained (%)		
				Unique	Shared	*Mediated*
	(Intercept)	-0.159	0.094			
Service provider portfolio	Consumer services	-0.009	0.003 **	0.005 *	3.542	*-0.008*
	Gastronomy	0.080	0.003 ***	0.452 ***	12.711	*1.395*
	Leisure facilities	0.056	0.003 ***	0.260 ***	12.663	*0.841*
Store portfolio	Clothing	0.093	0.003 ***	0.468 ***	13.860	*0.660*
	Footwear	0.013	0.003 ***	0.008 **	10.645	*0.039*
	Jewelry	-0.008	0.003 **	0.004 *	7.379	*-0.000*
	Electronics	-0.005	0.003 *	0.002	6.245	*0.013*
	Home décor	0.025	0.003 ***	0.054 ***	7.908	*0.224*
	Stationery	0.001	0.003	0.000	5.397	*0.007*
	Leisure	0.011	0.003 ***	0.008 **	8.196	*0.027*
	Optometrists	-0.031	0.003 ***	0.058 ***	1.435	*0.036*
	Books	0.018	0.003 ***	0.017 ***	5.879	*0.117*
	Drugs	-0.011	0.003 ***	0.007 **	3.866	*0.000*
	Groceries	0.014	0.002 ***	0.026 ***	2.678	*0.015*
Ambience	Buildings	0.178	0.003 ***	2.081 ***	18.949	
	Squares and parks	0.073	0.003 ***	0.370 ***	14.536	
	Landmarks	0.045	0.002 ***	0.194 ***	14.761	*13.479*
	Cleanness	0.079	0.003 ***	0.475 ***	11.179	
	Safety	0.037	0.003 ***	0.111 ***	8.769	
	Liveliness	0.130	0.003 ***	1.243 ***	18.134	
Accessibility	Access. public trans.	0.060	0.002 ***	0.368 ***	5.480	
	Access. car	0.044	0.003 ***	0.146 ***	1.980	
	Parking	0.029	0.002 ***	0.094 ***	1.902	
	Opening hours	0.020	0.002 ***	0.051 ***	3.917	

Model fit: Adjusted R^2 = 0.390; F-statistic = 1,779 on 40 and 111,246 degrees of freedom, p < 0.01

The model reveals that general consumer service providers are associated with a *lower* overall inner city attractiveness ($\beta_{services}$ = -0.009, $p_{services}$ < 0.001). Similarly, the store categories drugs and cosmetics (β_{drugs} = -0.011, p_{drugs} < 0.001), optometrists (β_{opto} = -0.031, p_{opto} < 0.001), jewelers ($\beta_{jewel.}$ = -0.008, $p_{jewel.}$ = 0.007), and electronics and telecommunications ($\beta_{elect.}$ = -0.005, $p_{elect.}$ = 0.034) are negatively associated with overall attractiveness. Stationery shops do not significantly affect overall inner city attractiveness, while clothing stores and gastronomy exercise the strongest effects ($\beta_{cloth.}$ = 0.093,

$p_{cloth.} < 0.001$; $\beta_{gastro.} = 0.080$, $p_{gastro.} < 0.001$).

As before, we also present effect size measures for a robust evaluation of the parameters. The majority of the measures for unique variance explained remain significant and support the relevance of clothing stores and gastronomy in predicting a city's attractiveness. Only, the previously significant negative effect of electronics stores disappears. The mediated effects show the proportion of variance explained jointly by the mediator, overall ambience, and the respective store or service provider, respectively. Their size underlines the importance of accounting for this mediation (please note, the negative mediated variance that we find for some variables may indicate suppression effects; Preacher and Kelley 2011). While the unique variances explained are again rather low as a result of our use of numerous interrelated measures, the shared variance explained is substantial and highlights the relevance of two other variables, namely leisure facilities and footwear stores.

Because the linear model does not adequately reflect the hierarchical data structure, we construct the multilevel SEM Model 2b as specified in Table 2. The model fits the data well as indicated by CFI = 0.999, RMSEA = 0.051, SRMR$_{within}$ = 0.005 and SRMR$_{between}$ < 0.001. Due to the large number of parameters, we present the regression results for the focal variables in Appendix A. The focal coefficients, the direct effects of the individual store and service provider categories on ambience and attractiveness are presented graphically in Figure 5. The coefficients for ambience are denoted on the horizontal axis and coefficients for the direct effect on attractiveness on the vertical axis. Significance levels are indicated with asterisks below the respective category label. Asterisks left (right) of the bar denoting the significance of the ambience (attractiveness) coefficient. The left (right) plots show the within- (between-) coefficients across the full data set on top as well the split sample for small (large) cities in the middle (at the bottom). The grey dashed lines intersect the horizontal and vertical axes at zero and thus split categories based on their coefficient signs: Categories in the top right (bottom left) quadrant have positive (negative) signs for their effect on ambience

as well as attractiveness. Categories in the top left (bottom right) have a positive coefficient for their effect on attractiveness (ambience) but a negative one for ambience (attractiveness).

Again, we find that ambience is strongly associated with attractiveness on both, the within- as well as between-city level. Regarding the within perspective on categories, we mostly observe a positive association between the evaluation of the category and the city's ambience and attractiveness perceptions. However, there are some categories with opposing effects such as consumer services, which positively influence ambience but negatively affect attractiveness. A higher evaluation of electronics stores and optometrists is even associated with significantly lower ambience and attractiveness perceptions.

Especially consumers' appreciating a city's gastronomy and leisure facilities tend to rate its ambience and attractiveness highly. In terms of stores, the effect of clothing stores is most pronounced but also other store categories are able to increase consumers' ambience and attractiveness measures such as booksellers and home décor stores.

Interestingly, consumer services are only positively associated with ambience but negatively with attractiveness. This may indicate that consumer services of very high quality may be appreciated for the ambience they provide but potentially lack utility for the majority of consumers who are not able or willing to afford these high-quality services.

These effects also partly translate to the between-city perspective. A higher average evaluation of a city's clothing and home décor stores improves its average perceived ambience and attractiveness. Furthermore, booksellers are strongly associated with ambience. Also congruent with the within perspective, cities with a high evaluation for their optometrists and electronics stores are perceived as less attractive and with lower ambience than other cities. Interestingly, while leisure facilities and gastronomy relate to a high ambience and attractiveness in the within-city perspective, their effect is less pronounced in the between-city perspective: They are still associated positively with ambience but their direct effect on attractiveness is insignificant or even negative in small cities.

Figure 5 – Category effects (coefficients) on ambience and attractiveness (Model 2b)
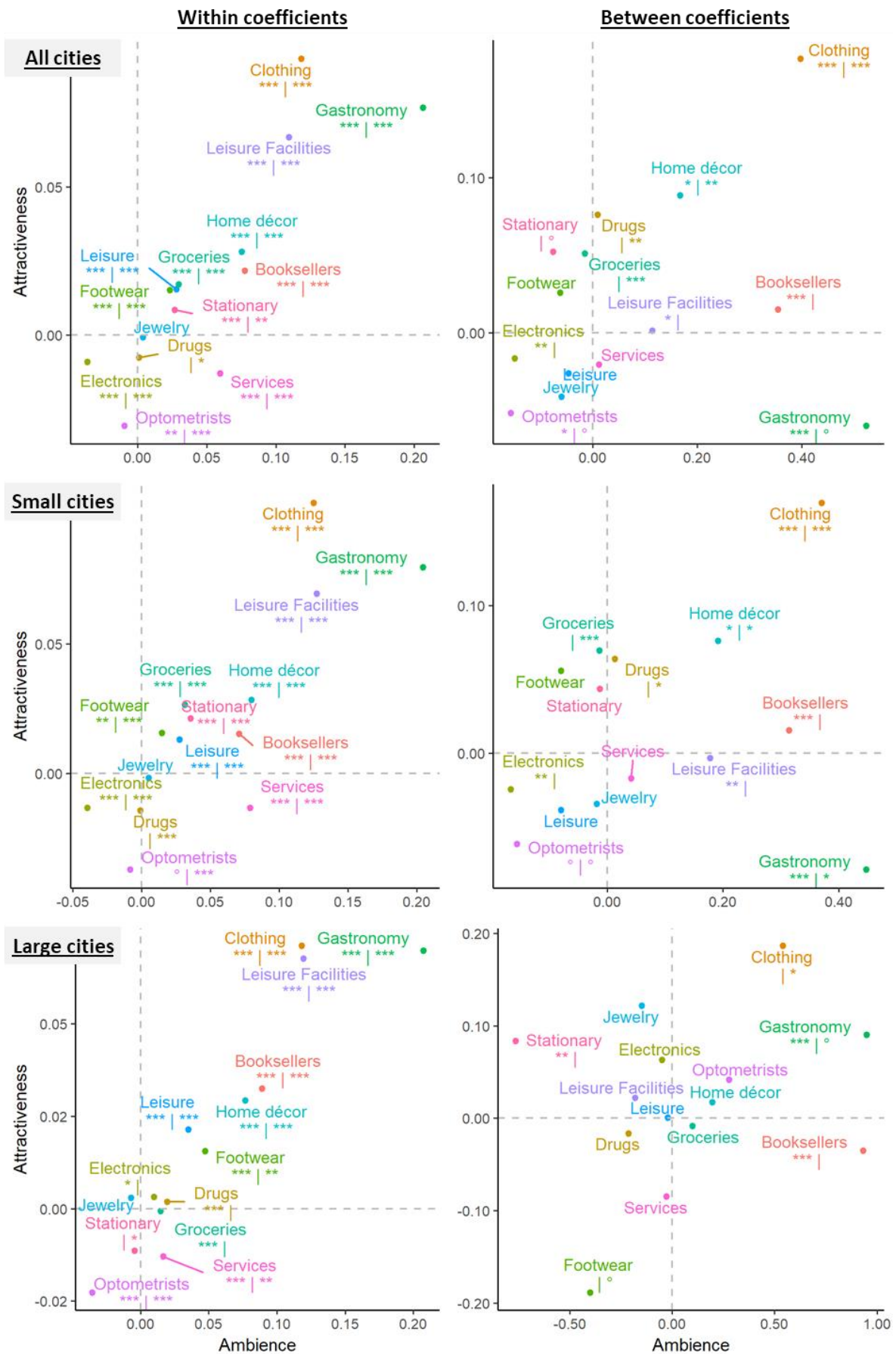
A high-quality gastronomy offering may therefore improve ambience but may also reduce attractiveness when it becomes unapproachable to the majority of consumers due to exclusivity and high prices.

While some categories such as grocery, footwear, leisure goods, and stationery shops are positively related to ambience and attractiveness in the within-perspective, they are not effective in driving attractiveness and ambience when compared across cities.

Quality versus quantity effects in cities' store and service provider portfolios

We now introduce the quantity of stores per city into the higher-level model. We first analyze the effect of the total number of stores in an inner city, which enters the higher-level model as a linear as well as squared term to capture potential diminishing or even adverse effects through too many stores. The model fit is acceptable (CFI = 0.996, RMSEA = 0.094, $SRMR_{within}$ = 0.012, $SRMR_{between}$ < 0.134). Regression results for the focal variables are presented in Appendix B.

The coefficients reveal that the total number of stores is not significantly associated with the attractiveness of an inner city, neither in small nor large cities. However, there are significant positive effects of a higher number of stores per capita on ambience (β_{small} = 0.107, p_{small} = 0.026; β_{large} = 0.753, p_{large} = 0.037) with decreasing returns as indicated by a negative and significant squared term (β_{small} = -0.009, p_{small} = 0.020; β_{large} = -0.068, p_{large} = 0.036). Thus, the model suggests a rather similar optimal number of stores in the observed categories for small (5.944) and large cities (5.581).

The sample average for cities' number of stores in the 12 categories per 1,000 is μ_{total} = 4.881 and virtually identical for small and large cities (μ_{small} = 4.872, μ_{large} = 4.891). Hence, given the regression results, cities seem to offer fewer stores than optimal from a consumer perspective and, therefore, officials should encourage and incentivize businesses and entrepreneurs to open stores in inner cities. The results also suggest that the number of stores is associated more strongly with ambience in larger cities, which indicates that the store and

service provider portfolios are part of the distinct charm of larger cities.

To get detailed insights into how each category's average evaluation and store quantity relate to ambience and attractiveness, we substitute the total number of stores per capita in the higher-level between model with the number of stores per capita for each category as specified in Model 2c.

We model the quantity of stores alongside their average evaluations. Thus, our model captures both the quality as well as quantity on inner cities' service provider and store portfolios. Hence, the between variance is measured by consumers average perceived attractiveness per category as well as the actual quantity of stores and consumer service providers which lets us observe the between-city differences from two perspectives – quantity (OSM data) as well as quality (survey data).

Again, we plot the coefficients as presented in Figure 6, this time focusing on the upper-level between-city model. Plots on the left show the coefficients for consumers average category evaluations (quality) and on the right the quantity of stores and service providers in the respective categories. The lower-level remains unchanged and accordingly its coefficients are largely unaffected by the inclusion of the new variables.

Overall, the mere quantity of stores is only positively related with ambience and attractiveness in a few cases such as consumer services, stationery shops, and optometrists. This may indicate that many cities lack an optimal number of stores in these categories. Interfacing with the quality coefficients on the left side of the plot, it becomes evident that in these categories it is indeed rather the quantity than the quality of stores that matters to consumers. For optometrists, for example, high quality stores may be perceived unapproachable to many consumers and therefore affect overall ambience and attractiveness perceptions negatively. In terms of a footwear, home décor, and jewelry shops, inner cities may benefit from offering fewer stores as indicated by the negative direct effect on attractiveness.

Figure 6 – Quality and quantity effects on ambience and attractiveness (Model 2c)
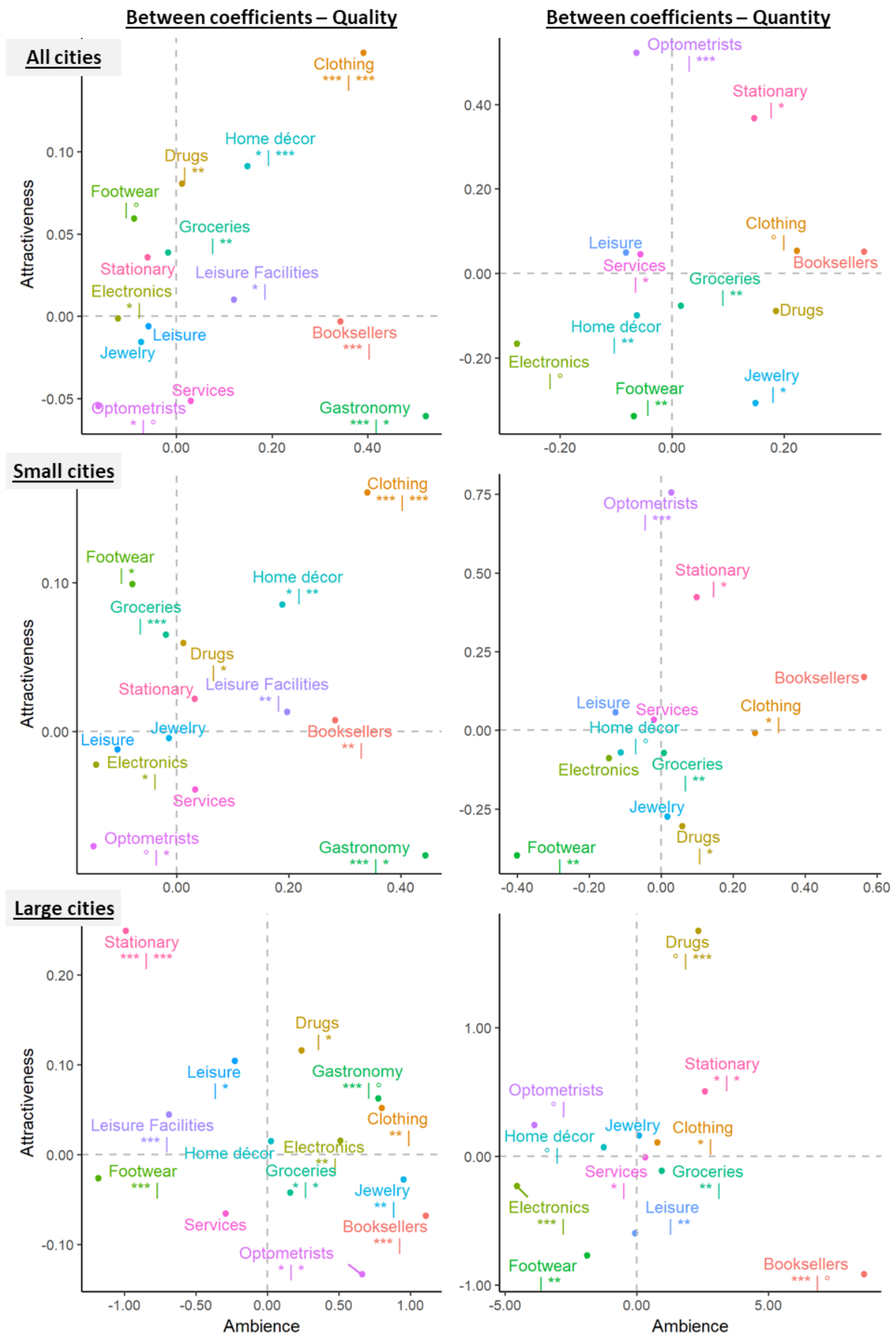
When looking at the split sample results, we again can see some notable differences between small and large cities. The positive quantity association is driven by smaller cities whereas in large cities, the coefficient is insignificant. Instead, there seems to be an unmet demand for drugs and cosmetics stores, which, as indicated by the quality coefficients, should be of high quality. In addition, a higher number of booksellers and grocery stores are positively related to ambience. In contrast, a high number of electronics and telecommunication stores negatively relates to ambience, while leisure goods stores negatively relates to attractiveness. Although jewelry stores seem to be irrelevant in smaller cities, a high quality may improve ambience in larger cities.

Discussion

Our various analyses reveal how an inner city's portfolio of stores and service providers is related to its perceived attractiveness. This relationship is partially mediated through ambience implicating that a city's commercial offering does not only satisfy consumers' utilitarian shopping needs by offering availability but indeed adds to the hedonic and experiential perception of inner cities captured in its perceived ambience. This association, although moderated by city size, holds true for small and large cities. Accordingly, our research shows that brick-and-mortar stores are an important corner stone for inner cities of any size despite the ongoing digitization of shopping.

The attractiveness of a city's retail portfolio is determined along two dimensions: quantity and quality of stores. Our results show that for small cities the aggregate quality rather than the quantity of stores is associated with inner city attractiveness, whereas large cities may profit from a larger number of stores in many categories. When looking at the aggregate number of stores, from the consumer perspective the average inner city would benefit from an increase in the number of stores.

By exploring the heterogeneity among different categories, we find that their individual

attractiveness is positively related to the overall perception of a city's store and service provider portfolios. However, not all categories are equally associated with inner city ambience and attractiveness. Instead, there is strong heterogeneity among categories with some even being negatively associated with ambience and/or attractiveness.

Across all settings, a high evaluation of clothing as well as home décor stores positively relates to ambience as well as attractiveness. A city's gastronomy and leisure facilities are also associated with high ambience and attractiveness and distinguish cities especially in terms of their ambience. In contrast, optometrists, electronics and telecommunications stores, and service providers are associated with low inner city attractiveness. Potentially, this is because they serve infrequent needs and are less inviting to hedonic shopping behavior such as browsing. Clothing and home décor stores, gastronomy, leisure facilities, and bookstores in contrast, usually encourage hedonic consumption and shopping experiences. Respondents' high rating of categories may also indicate that they are of such a high quality that they may become unapproachable or unaffordable for the majority of consumers. For example, a city with a few high-class electronics stores, optometrists, or consumer services is likely to be evaluated positively in these categories but ultimately does not provide value to consumers given their exclusivity, leading to a low attractiveness evaluation of the inner city.

When observing the actual number of stores in the respective category, the results again point towards clothing stores being strongly associated with city attractiveness – in terms of not only quality but also quantity. Booksellers, in contrast do not show a significant association, indicating that here a few high quality stores may be more important for a city than a large variety of stores in that category. Stationery stores perform surprisingly well, with a larger quantity being associated with attractiveness in smaller cities and ambience in larger cities. This may also indicate that stationery shops are underrepresented in most cities, as evident from the cumulative distribution plot presented previously (Figure 4). Interestingly, consumer services again perform badly being negatively associated with ambience and

attractiveness in large cities. Consumers may be less interested in service providers when visiting inner cities and rather prefer categories that allow them to shop and browse.

Our results show that while some categories may profit from higher availability through a larger number of stores, other categories are over-represented so that cities may profit from a reduced number of stores. At the same time, some categories may profit from being more exclusive, i.e., offering a higher perceived quality or uniqueness. In contrast, other categories should focus on inclusivity, for example, by offering stores service providers with assortments and prices that are approachable and affordable for the majority of consumers. These various category-specific recommendations for small and large cities, respectively, are presented in Table 8.

Table 8 – Category-specific store and service provider portfolio management strategies

Category	Small Cities	Large Cities
Consumer services	Neutral	Fewer and more inclusive
Gastronomy	Ensure inclusiveness	Ensure exclusiveness
Leisure facilities	Ensure exclusiveness	Ensure inclusiveness
Clothing	Ensure exclusiveness and availability	Ensure exclusiveness and availability
Footwear	Fewer and more exclusive	Fewer and more inclusive
Jewelry	Neutral	Ensure exclusiveness
Electronics	Ensure inclusiveness	Fewer and more exclusive
Home décor	Ensure exclusiveness	Ensure exclusiveness
Stationery	Ensure availability	Ensure availability
Leisure	Ensure exclusiveness	Fewer and more exclusive
Optometrists	Ensure inclusiveness and availability	Neutral
Books	Ensure exclusiveness	Ensure exclusiveness and availability
Drugs	Fewer and more exclusive	Ensure exclusiveness and availability
Groceries	Fewer and more exclusive	Ensure exclusiveness and availability

Managerial and societal implications

Taking a more holistic perspective on this research, we see the importance of brick-and-mortar stores, not only for companies as a distribution channel but rather from the perspective of consumers and citizens. Stores and service providers significantly add to inner cities'

attractiveness and ambience and, thus, are not only a source of utilitarian consumption but rather hedonic experiences. Hence, a city's offering of stores and service providers can be a source of quality of life and satisfaction (Zenker, Petersen, and Ahold 2013).

Our results may inform city planners and government officials with regard to TCM initiatives in several capacities. First, they show the importance of commercial offerings in general but not only providing consumers' utilitarian shopping value but also substantial hedonic value by adding to the cities ambience. Second, the results inform city planners and officials by providing indications into which categories improve a city's attractiveness by adjustments in the quantity and/or quality of stores and service providers in the various categories. Based on these insights, officials may use their capabilities and incentives to attract certain types of stores and service providers to their city. Third, the results reveal synergetic effects between certain industries and cities, which may inform how public funds and other stimuli are distributed. For example, the results point towards the positive influence of categories such as clothing and bookstores or leisure facilities like museums and (movie) theaters, which are all heavily under attack from online competitors. Therefore, a city may benefit from supporting these sectors, for example, through funding, tax cuts, or ceilings on rents, thus making sure businesses in these categories can afford inner city locations (HDE 2019b). These results also serve as a justification for the heavy subsidies many local governments provide for leisure facilities.

The results may also help managers in the various researched industries. Based on this study, they can scrutinize whether and in which type of city to open or potentially even close a store based on their specific sector, the size of the respective city, and the quantity and quality of its current commercial portfolio. In addition, the results on exclusivity versus inclusivity of the store and service provider portfolios may also help managers to optimize their distribution strategy.

Future research implications

This research only presents a first glimpse into this multifaceted, complex, and largely under-researched field. Future studies may want to dive deeper into the composition of store portfolios, discerning the different effects of large chains versus small local businesses on ambience and attractiveness. Other interesting research opportunities may arise from analyzing competition between cities and the role of depth versus breadth in a city's store and service provider portfolios. In addition, future studies may also advance the field methodologically, for example, by collecting longitudinal data, control for the inherent endogeneity of inner city attractiveness and the types of businesses that open a location, or the use of new data sources. Especially (anonymized) location tracking via mobile phones would lend itself to this topic as it may measure how often inner cities are frequented and which types of stores are actually visited, similar to the research provided by Martí, Serrano-Estrada, and Nolasco-Cirugeda (2017).

Given that our data set is limited to German cities, future research may also analyze inner cities in other countries and regions. While there are no systematic differences in German cities per se, there are structural differences in the cities of the "new world" which usually feature a more concentrated inner city than European cities (The Economist 2007). In addition, the largest German city Berlin only features 3.8 million inhabitants whereas today's megacities, of which many are located on the Asian continent, are substantially larger such as Tokyo with its approximately 40 million inhabitants. As such, future research should address these structural differences across cities around the globe and their specific drivers of attractiveness. Furthermore, cultural differences may emerge in which characteristics of a city add most to its attractiveness. For example, more collectivist cultures may value communal spaces more than individualistic cultures and cultures scoring higher on indulgence may prefer other store categories that those scoring lower.

References

Ashworth, Gregory and Mihalis Kavaratzis (2009), "Beyond the logo: Brand management for cities," *Journal of Brand Management*, 16(8), 520-531.

Babin, Barry J., William R Darden, and Mitch Griffin (1994), "Work and/or Fun: Measuring Hedonic and Utilitarian Shopping Value," *Journal of Brand Management*, 16(8), 520-531.

Baker, Robert G.V. (2002), "The impact of the deregulation of retail hours on shopping trip patterns in a mall hierarchy: an application of the RASTT model to the Sydney project (1980–1998) and the global vacant shop problem," *Journal of Retailing and Consumer Services*, 9(3), 155-171.

Bell, Simon J. (1999), "Image and consumer attraction to intraurban retail areas: An environmental psychology approach," *Journal of Retailing and Consumer Services*, 6(2), 67-78.

Bloch, Peter H., Nancy M Ridgway, and Scott A. Dawson (1994), "The Shopping Mall as Consumer Habit," *Journal of Retailing*, 70(1), 23-42.

Cheema, Amar and Purushottam Papatla (2010), "relative importance of online versus offline information for Internet purchases: Product category and Internet experience effects," *Journal of Business Research*, 63, 979-985.

Erik, Braun, Mihalis Kavaratzis, and Sebastian Zenker (2013), "My city – my brand: the different roles of residents in place branding," *Journal of Place Management and Development*, 6(1), 18-28.

Darchen, Sebastien and Diane-Gabrielle Tremblay (2010), "What attracts and retains knowledge workers/students: The quality of place or career opportunities? The cases of Montreal and Ottawa," *Cities*, 27(4), 225-233.

Darden, William R. and Barry J. Babin (1994), "Exploring the concept of affective quality: Expanding the concept of retail personality." *Journal of Business Research*, 29(2), 101-109.

De Nisco, Alessandro, Angelo Riviezzo, and Maria R. Napolitano (2008), "The role of stakeholders in town centre management: guidelines for identification and analysis," *Journal of Place Management and Development*, 1(2), 166-176.

——— and Gary Warnaby (2014), "Urban design and tenant variety influences on consumers' emotions and approach behavior," *Journal of Business Research*, 67(2), 211-217.

De Noni, Ivan, Luigi Orsi, and Luca Zanderighi (2014), "Attributes of Milan influencing city brand attractiveness," *Journal of Destination Marketing & Management*, 3(4), 218-226.

Der Spiegel (2019), "Handel warnt vor Verödung der Innenstädte," *Der Spiegel* (February 18), https://www.spiegel.de/wirtschaft/unternehmen/handel-beklagt-veroedete-innenstaedte-bereits-11-000-geschlossene-geschaefte-a-1253774.html.

Fertner, Christian, Niels B. Groth, Lise Herslund, and Trine A. Carstensen), "Small towns resisting urban decay through residential attractiveness. Findings from Denmark," *Geografisk Tidsskrift-Danish Journal of Geography*, 115(2), 119-132.

Florek, Magdalena (2011), "No place like home: Perspectives on place attachment and impacts on city management," *Journal of Town & City Management*, 1(4), 346-354.

Fornell, Claes, Michael D. Johnson, Eugene W. Anderson, Jaesung Cha, and Barbara E. Bryant (1996), "The American Customer Satisfaction Index: Nature, Purpose, and Findings," *Journal of Marketing*, 60(4), 7-18.

Hart, Cathy, Grazyna Tachow, and John W. Cadogan (2013), "Conceptualizing town cnetre image and the customer experience," *Journal of Marketing Management*, 29(15-16), 1753-1781.

HDE (2019a), "Innenstädte in Gefahr: HDE fordert Sofortprogramm," *Handelsverband Deutschland* (February 18), https://einzelhandel.de/presse/aktuellemeldungen/11955-innenstaedte-in-gefahr-hde-fordert-sofortprogramm.

HDE (2019b), "Gute Politik für attraktive Innenstädte: 11-Punkte-Plan des HDE," *Handelsverband Deutschland*, (accessed May 06, 2020), https://einzelhandel.de/index.php?option=com_attachments&task=download&id=10374

Hirschman, Elizabeth C. and Morris B. Holbrook (1982), "Hedonic consumption: Emerging concepts, methods and propositions," *Journal of Marketing*, 77(6), 1-20.

Holder, Josh (2019), "High street crisis deepens: 1 in 12 shops closed in five years," *The Guardian* (January 30), https://www.theguardian.com/cities/ng-interactive/2019/jan/30/high-street-crisis-town-centres-lose-8-of-shops-in-five-years.

Huff, David L. (1963), "A probabilistic analysis of shopping center trade areas," *Land Economics*, 39(1), 81-90.

Insch, Andrea and Magdalena Florek (2008), "A great place to live, work and play: Conceptualising place satisfaction in the case of a city's residents," *Journal of Place Management and Development*, 1(2), 138-149.

———— and Menique Stuart (2015), "Understanding resident city brand disengagement," *Journal of Place Management and Development*, 8(3), 172-186.

Institut für Handelsforschung Köln IFH (2018), "Vitale Innenstädte 2018," Institut für Handel, Köln.

Johnson, Daniel (2013), "Town centres in 'terminal decline', taskforce warns," *The Telegraph* (November 29), https://www.telegraph.co.uk/finance/newsbysector/retailandconsumer/10483127 /Town-centres-in- terminal-decline-taskforce-warns.html.

Jones, Monique A. (1999), "Entertaining Shopping Experience: An Exploratory Investigation," *Journal of Retailing and Consumer Services*, 6(1), 129-139.

Kavaratzis, Michalis (2004), "From city marketing to city branding: Towards a theoretical framework for developing city brands," *Place Branding*, 1(1), 58-73.

Källström, Lisa, Simon Persson, and Jakob Westergren (2019), "The role of place in city centre retailing," *Place Branding and Public Diplomacy*, 1-14.

Khan, Uzma, Ravi Dhar, and Klaus Wertebroch (2005), "A behavioral decision theory perspective on hedonic and utilitarian choice," in *Inside consumption: Frontiers of research on consumer motives, goals, and desires,* Srinivasan Ratneshwar and David G. Mick, eds. London, Routledge, 144-165.

Kraha, Amanda, Heather Turner, Kim Nimon, Linda Zientek, and Robin Henson (2012), "Tools to support interpreting multiple regression in the face of multicollinearity," *Frontiers in psychology*, 3, 44.

Lin, Mingfeng, Henry C. Lucas Jr, and Galit Shmueli (2013), "Research commentary—too big to fail: large samples and the p-value problem," *Information Systems Research*, 24 (4), 906–917.

MacKinnon, David Peter (2008), *Introduction to Statistical Mediation Analysis*, Multivariate applications, New York: Lawrence Erlbaum Associates.

Mehrabian, Albert and James A. Russell (1974), "An Approach to Environmental Psychology," Cambridge, MIT Press.

Merrilees, Bill, Dale Miller, Gloria L. Ge, and Charles C.C. Tam (2018), "Asian city brand meaning: a Hong Kong perspective," Journal of Brand Management, 25(1), 14-26.

———, Dale Miller, and Carmel Herrington (2009), "Antecedents of residents' city brand attitudes," *Journal of Business Research*, 62(3), 362-367.

———, ———, and ——— (2012), "Multiple stakeholders and multiple city brand meanings," *European Journal of Marketing*, 46(7/8), 1032-1047.

Murphy, Raymond E. and J. E. Vance (1954), "Delimiting the CBD," *Economic Geography*, 30 (3), 189–222.

Martí, Pablo, Leticia Serrano-Estrada, and Almudena Nolasco-Cirugeda (2017), "Using locative social media and urban cartographies to identify and locate successful urban plazas," *Cities*, 64, 66–78.

Parkerson, Brenda and John Saunders (2005), "City branding: can goods and services branding models be used to brand cities?," *Place Branding and Public Diplomacy*, 1(3), 242-264.

Preacher, Kristopher J. and Ken Kelley (2011), "Effect size measures for mediation models: Quantitative strategies for communicating indirect effects.," *Psychological Methods*, 16 (2), 93–115.

Ratchford, Brian T. (1987), "New insights about the FCB grid," *Journal of Advertising Research*, 27(4), 24-38.

Reinartz, Werner J. and V. Kumar (1999), "Store-, market-, and consumer-characteristics: The drivers of store performance," *Marketing Letters*, 10(1), 5-23.

Rosseel, Yves (2012), "lavaan: An R Package for Structural Equation Modeling," *Journal of Statistical Software*, 48(2), 1–36, http://www.jstatsoft.org/v48/i02/.

Taecharungroj, Viriya (2016), "City ambassadorship and citizenship behaviours," *Journal of Place Management and Development*, 9(3), 331-350.

Teller, Christoph (2008), "Shopping streets versus shopping malls–determinants of agglomeration format attractiveness from the consumers' point of view," *The International Review of Retail, Distribution and Consumer Research*, 18(4), 381-403.

———— and Jonathan Elms (2010), "Managing the attractiveness of evolved and created retail agglomerations formats," *Marketing Intelligence & Planning*, 28(1), 25-45.

———— and ———— (2012), "Urban place marketing and retail agglomeration customers," *Journal of Marketing Management*, 28(5-6), 546-567.

————, ————, Jennifer A. Thomson, and Andrew R. Paddison (2010), "Place marketing and urban retail agglomerations: An examination of shoppers' place attractiveness perceptions," *Place Branding and Public Diplomacy*, 6(2), 124-133.

———— and Thomas Reutterer (2008), "The evolving concept of retail attractiveness: what makes retail agglomerations attractive when customers shop at them?," *Journal of Retailing and Consumer Services*, 15(3), 127-143.

————, ————, and Peter Schnedlitz (2008), "Hedonic and utilitarian shopper types in evolved and created retail agglomerations," *The International Review of Retail, Distribution and Consumer Research*, 18(3), 283-309.

The Economist (2007), "Downtowns - Where the lights aren't bright," *The Economist*, 382 (8518), 39.

Turley, L.W. and Ronald E. Milliman (2000), "Atmospheric Effects on Shopping Behavior: A Review of the Experimental Evidence," *Journal of Business Research*, 49(2), 1983-211.

Verhoef, Peter C., Katherine N. Lemon, A. Parasuraman, Anne Roggeveen, Michael Tsiros, and Leonard A. Schlesinger (2009), "Customer experience creation: Determinants, dynamics and management strategies," *Journal of Retailing*, 85(1), 31-41.

Weltevreden, Jesse W.J. and Ton van Rietbergen (2007), "E-Shopping versus City Centre Shopping: The Role of Perceived City Centre Attractiveness," *Tijdschrift voor economische en sociale geografie*, 98(1), 68-85.

Zenker, Sebastian (2009), "Who's your target? The creative class as a target group for place branding," *Journal of Place Management and Development*, 2(1), 23-32.

———— (2011), "How to catch a city? The concept and measurement of place brands," *Journal of Place Management and Development*, 4(1), 40-52.

———— and Nicole Martin (2011), "Measuring success in place marketing and branding," *Place Branding and Public Diplomacy*, 7(1), 32-41.

————, Sybille Petersen, and Andreas Aholt (2013), "The Citizen Satisfaction Index (CSI): Evidence for a four basic factor model in a German sample," *Cities*, 31, 156-164.

———— and Natascha Rütter (2014), "Is satisfaction the key? The role of citizen satisfaction, place attachment and place brand attitude on positive citizenship behavior," *Cities*, 38, 11-17.

APPENDIX

Appendix A

Table A1: Complete category-level OLS regression results (Model 2a)

Variable group	Variable	Estimate	SE	
	(Intercept)	-0.159	0.094	
Service provider portfolio	Consumer services	-0.009	0.003	**
	Gastronomy	0.080	0.003	***
	Leisure facilities	0.056	0.003	***
Store portfolio	Clothing	0.093	0.003	***
	Footwear	0.013	0.003	***
	Jewelry	-0.008	0.003	**
	Electronics	-0.005	0.003	*
	Home décor	0.025	0.003	***
	Stationery	0.001	0.003	
	Leisure	0.011	0.003	***
	Optometrists	-0.031	0.003	***
	Books	0.018	0.003	***
	Drugs	-0.011	0.003	***
	Groceries	0.014	0.002	***
Ambience	Buildings	0.178	0.003	***
	Squares and parks	0.073	0.003	***
	Landmarks	0.045	0.002	***
	Cleanness	0.079	0.003	***
	Safety	0.037	0.003	***
	Liveliness	0.130	0.003	***
Accessibility	Access. public trans.	0.060	0.002	***
	Access. car	0.044	0.003	***
	Parking	0.029	0.002	***
	Opening hours	0.020	0.002	***
Respondent controls	Age	-0.001	0.000	***
	Gender	0.011	0.005	*
	Resident	-0.015	0.005	**
	Shopping visit freq.	0.002	0.002	
City controls	Population size	0.016	0.003	***
	Average age	0.009	0.002	***
	Unemployment	-4.247	0.233	***
	Leisure vs. Resident. Area	0.092	0.010	***
Survey Controls	Year	-0.003	0.005	
	Week	0.034	0.004	***
	Tuesday	-0.011	0.012	
	Wednesday	0.013	0.013	
	Thursday	0.014	0.013	
	Friday	0.025	0.013	*
	Saturday	0.051	0.015	***
	Sunday	0.020	0.047	

Model fit: Adjusted R^2 = 0.389; F-statistic = 1,779 on 40 and 111,246 degrees of freedom, $p < 0.01$

Appendix B: Multilevel SEM regression results for focal variables

Table B1: Level 1 – "within" results

		Survey data		+ total number of stores		+ number of stores per category	
Model Fit	CFI	0.999		0.996		0.999	
	RMSEA	0.051		0.094		0.051	
	SRMR within	0.005		0.012		0.005	
	SRMR between	0.000		0.134		0.001	

Level 1 - within

DV~ Variable	Estimate	SE	Estimate	SE	Estimate	SE
Ambience~						
Services_Quality	0.060	0.003***	0.076	0.004***	0.059	0.003***
Gastronomy_Quality	0.206	0.003***	0.188	0.003***	0.207	0.003***
Leisure facil._Quality	0.110	0.003***	0.139	0.003***	0.109	0.003***
Clothing_Quality	0.118	0.003***	0.119	0.004***	0.118	0.003***
Footwear_Quality	0.023	0.004***	0.042	0.004***	0.024	0.004***
Jewelry_Quality	0.004	0.003	0.008	0.004*	0.004	0.003
Electronics_Quality	-0.036	0.003***	-0.004	0.003	-0.036	0.003***
Home décor_Quality	0.075	0.003***	0.068	0.003***	0.075	0.003***
Stationery_Quality	0.027	0.003***	0.027	0.004***	0.027	0.003***
Leisure_Quality	0.028	0.003***	0.035	0.003***	0.028	0.003***
Optometrists_Quality	-0.009	0.003**	-0.005	0.004	-0.009	0.003**
Books_Quality	0.077	0.003***	0.050	0.004***	0.078	0.003***
Drugs_Quality	0.001	0.003	0.028	0.004***	0.000	0.003
Groceries_Quality	0.030	0.002***	0.033	0.003***	0.030	0.002***
Attractiveness~						
Ambience	0.438	0.003***	0.452	0.003***	0.438	0.003***
Services_Quality	-0.013	0.003***	-0.005	0.003	-0.012	0.003***
Gastronomy_Quality	0.077	0.003***	0.073	0.003***	0.076	0.003***
Leisure facil._Quality	0.067	0.002***	0.075	0.003***	0.067	0.002***
Clothing_Quality	0.093	0.003***	0.083	0.003***	0.094	0.003***
Footwear_Quality	0.015	0.003***	0.022	0.003***	0.015	0.003***
Jewelry_Quality	-0.001	0.003	-0.002	0.003	-0.001	0.003
Electronics_Quality	-0.009	0.002***	-0.005	0.003°	-0.009	0.002***
Home décor_Quality	0.028	0.002***	0.021	0.003***	0.028	0.002***
Stationery_Quality	0.008	0.003**	0.009	0.003**	0.009	0.003**
Leisure_Quality	0.016	0.003***	0.014	0.003***	0.015	0.003***
Optometrists_Quality	-0.031	0.003***	-0.019	0.003***	-0.031	0.003***
Books_Quality	0.022	0.003***	0.014	0.003***	0.022	0.003***
Drugs_Quality	-0.008	0.003*	-0.006	0.003°	-0.007	0.003*
Groceries_Quality	0.017	0.002***	0.017	0.002***	0.017	0.002***

Table B2: Level 2 – "between" results for ambience

	Survey data		+ total number of stores		+ number of stores per category	
Level 2 - between						
DV~ **Variable**	**Estimate**	**SE**	**Estimate**	**SE**	**Estimate**	**SE**
Ambience_Mean ~						
Services_Quality_Mean	0.012	0.108	-0.492	0.175**	0.030	0.112
Gastronomy_Quality_Mean	0.524	0.071***	0.287	0.109**	0.520	0.071***
Leisure facil._Quality_Mean	0.113	0.058*	0.160	0.082°	0.120	0.058*
Clothing_Quality_Mean	0.398	0.088***	0.452	0.138**	0.391	0.089***
Footwear_Quality_Mean	-0.063	0.093	-0.262	0.143°	-0.089	0.096
Jewelry_Quality_Mean	-0.061	0.082	0.178	0.127	-0.073	0.086
Electronics_Quality_Mean	-0.150	0.053**	-0.023	0.078	-0.122	0.054*
Home décor_Quality_Mean	0.167	0.069*	0.019	0.102	0.149	0.071*
Stationery_Quality_Mean	-0.076	0.079	-0.174	0.115	-0.060	0.082
Leisure_Quality_Mean	-0.047	0.086	-0.023	0.127	-0.058	0.086
Optometrists_Quality_Mean	-0.157	0.076*	-0.235	0.115*	-0.163	0.078*
Books_Quality_Mean	0.355	0.087***	0.344	0.127**	0.342	0.088***
Drugs_Quality_Mean	0.009	0.069	0.133	0.105	0.012	0.069
Groceries_Quality_Mean	-0.015	0.031	-0.021	0.044	-0.017	0.032
Number of Stores			0.089	0.046*°		
Number of Stores_squared			-0.008	0.004*		
Services_Quantity					-0.057	0.058
Clothing_Quantity					0.222	0.115°
Footwear_Quantity					-0.069	0.340
Jewelry_Quantity					0.149	0.420
Electronics_Quantity					-0.277	0.230
Home décor_Quantity					-0.063	0.097
Stationery_Quantity					0.146	0.407
Leisure_Quantity					-0.083	0.217
Optometrists_Quantity					-0.064	0.398
Books_Quantity					0.342	0.591
Drugs_Quantity					0.185	0.327
Groceries_Quantity					0.016	0.067

Table B3: Level 2 – "between" results for attractiveness

DV~ Variable	Survey data		+ total number of stores		+ number of stores per category	
	Estimate	SE	Estimate	SE	Estimate	SE
Level 2 - between						
Attractiveness_Mean~						
Ambience_Mean	0.719	0.026***	0.810	0.021***	0.717	0.025***
Services_Quality_Mean	-0.020	0.043	-0.081	0.055	0.160	0.034***
Gastronomy_Quality_Mean	-0.060	0.031°	-0.115	0.034**	0.059	0.036°
Leisure facil._Quality_Mean	0.001	0.023	-0.003	0.025	-0.016	0.032
Clothing_Quality_Mean	0.177	0.036***	0.175	0.043***	-0.001	0.020
Footwear_Quality_Mean	0.026	0.037	0.031	0.044	0.091	0.026**
Jewelry_Quality_Mean	-0.041	0.033	-0.038	0.039	0.036	0.030
Electronics_Quality_Mean	-0.016	0.021	0.013	0.024	-0.006	0.032
Home décor_Quality_Mean	0.089	0.027**	0.083	0.031**	-0.055	0.029°
Stationery_Quality_Mean	0.052	0.031°	0.048	0.035	-0.003	0.034
Leisure_Quality_Mean	-0.026	0.034	-0.023	0.039	0.081	0.026**
Optometrists_Quality_Mean	-0.052	0.030°	-0.047	0.035	0.039	0.012**
Books_Quality_Mean	0.015	0.036	0.006	0.039	-0.051	0.042
Drugs_Quality_Mean	0.076	0.027**	0.105	0.032**	-0.061	0.029*
Groceries_Quality_Mean	0.051	0.012***	0.053	0.013***	0.010	0.022
Number of Stores			-0.011	0.014		
Number of Stores_squared			0.000	0.001		
Services_Quantity					0.045	0.022*
Clothing_Quantity					0.054	0.043
Footwear_Quantity					-0.337	0.126**
Jewelry_Quantity					-0.306	0.156°
Electronics_Quantity					-0.165	0.086°
Home décor_Quantity					-0.099	0.036**
Stationery_Quantity					0.367	0.151*
Leisure_Quantity					0.050	0.080
Optometrists_Quantity					0.522	0.147***
Books_Quantity					0.052	0.219
Drugs_Quantity					-0.088	0.121
Groceries_Quantity					-0.076	0.025**