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Influence of Urban Street Vending on Pedestrian Experience and Behaviour: A Systematic Quantitative Review

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ABSTRACT

Urban street vending is an integral part of everyday public life and can contribute to vibrant and lively streets. Yet, few cities formally integrate this activity into public space design. This is because street vending is a highly contested, although transformative phenomenon that has complex inter-relationships with other urban entities. This paper systematically and quantitatively assesses the breadth and depth of academic literature that studied such a relationship; more specifically, the influence of street vending on pedestrians' experiences and behaviours and thereby identifies gaps in the existing literature. A systematic review of 25 peer-reviewed journal articles is undertaken to provide an assessment of the geographic extent, disciplinary scope, timeline of publications, keywords, methods, theories, constructs and concepts. This review concludes that the existing research is emerging, but rapidly accelerating and cross-disciplinary. Although the research was predominantly conducted in the Global South, it is largely affiliated with the Global North with limited North-South partnerships. The literature is largely qualitative, indicating a propensity for skewed perspectives. It also lacks theoretical applications exclusive to pedestrian-vendor relationships. Finally, potential areas where future researchers may expand and influence the knowledge domain are identified. This includes developing multi-contextual global perspectives through North-South partnerships and combining or independently applying grounded theory, mixed methods and case study research to broaden theoretical and empirical bases.

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Highlights

- The research linking street vending and pedestrian experience and behaviour is emerging and rapidly accelerating.
- Most of the research is conducted in the Global South, but largely affiliated to the Global North.
- The existing research lacks theoretical applications exclusive to pedestrian-vendor relationships.
- Grounded theory, case studies and mixed methods approaches can broaden theoretical and empirical bases.

Contribution to the field statement

This review draws attention to the often neglected role of street vending in shaping the dynamics of cities, particularly its influence on the everyday urban activity of walking. Furthermore, it underscores the necessity for more comprehensive research in this specific area. This article promotes a deeper comprehension of the current research by analysing trends and patterns, pinpointing gaps and limitations and suggesting potential avenues for future research. This, in turn, may provide valuable insights for urban planning and policymaking, facilitating the optimization of this activity's positive contributions to local economies and communities.

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1. Introduction

Globally, walking is perceived as an essential activity of urban street space. The experiences and behaviours of pedestrians who engage in this activity are determined by how pedestrian-friendly or walkable their environment is. They are influenced by and in return can influence other dimensions of the urban realm such as street vending. Street vending has its importance in making vibrant and lively streets, but is a spatially, economically, politically and socially contested phenomenon. This is because the presence of street vendors can be extensively transformative in urban space. This quality can be perceived negatively by city authorities who consider street vending as a hindrance to other urban activities and processes. However, street vending is a prevalent and persistent force no matter the regulations and policies that seek to curb it. Researchers studying the influence of street vending on essential urban activities such as walking can inform urban authorities, policymakers, planners and designers. However, researchers studying such an influence should first be aware of the gaps in existing literature before undertaking such a study. Therefore this paper in turn seeks to inform such researchers of such gaps and recommend future research directions.

Street vending and walkability have been reviewed consistently in the past. The topic of street vending has been reviewed six times since 2000 across a range of themes. Unique perspectives include a comparative study between Global North and Global South (Recchi, 2020), a comparison between historical and contemporary policies (Morales, 2000), magnitude of vending (Bhowmik, 2005) and financial capital and personality traits (Wongtada, 2014). All the reviews assess policy and regulation, making it the most reviewed theme (Bhowmik, 2005; Bromley, 2000; Morales, 2000; Peimani & Kamalipour, 2022a; Recchi, 2020; Wongtada, 2014). Other common themes include characteristics of vendors (Bhowmik, 2005; Peimani & Kamalipour, 2022a; Recchi, 2020), typology of street vendors (Peimani & Kamalipour, 2022a; Wongtada, 2014), human and social capital (Bhowmik, 2005; Morales, 2000; Recchi, 2020; Wongtada, 2014), working environments (Recchi, 2020; Wongtada, 2014) and health and well-being (Bromley, 2000; Peimani & Kamalipour, 2022a). Peimani and Kamalipour (2022a) also reviewed the literature on technology, linked to other forms of informality and spatiality of street vending for the first time.

There is no dearth of reviews on walkability as reported by Ewing et al in 2015. Since then, a multitude of reviews have emerged discussing varied perspectives related to the built environment (Arellana et al., 2020; Bonaccorsi et al., 2020; Dadpour et al., 2016; Elzeni et al., 2022; Fonseca et al., 2022; Hassen & Kaufman, 2016; Jamei et al., 2021; Nasrollahi et al., 2020; Salvo et al., 2018; Smith et al., 2017; Wang & Yang, 2019; Westenhöfer et al., 2023; Yun, 2019), health and well-being (Baobeid et al., 2021; Bonaccorsi et al., 2020; Klann et al., 2019; Nasrollahi et al., 2020; Salvo et al., 2018; Smith et al., 2017; Wang & Yang, 2019; Westenhöfer et al., 2023), social factors (Bonaccorsi et al., 2020; Dadpour et al., 2016; Hassen & Kaufman, 2016; Herrmann-Lunecke et al., 2020; Iroz-Elardo et al., 2021; Klann et al., 2019; Salvo et al., 2018), context (Jamei et al., 2021; Klann et al., 2019), evaluation tools (Arellana et al., 2020; Blečić et al., 2020; Dragović et al., 2023; Wang & Yang, 2019) and sustainability (Baobeid et al., 2021; Herrmann-Lunecke et al., 2020; Nasrollahi et al., 2020). Pedestrian experience (Arellana et al., 2020; De Vos et al., 2023; Hassen & Kaufman, 2016; Nasrollahi et al., 2020; Salvo et al., 2018) and behaviour (Basu et al., 2022; Feng et al., 2021; Salvo et al., 2018; Yun, 2019) have also been reviewed within the topic of walkability.

However, while both topics of street vending and walkability have been reviewed separately using varying methodologies such as bibliometric analysis, critical review, narrative review, systematic literature review and meta-analysis, none of the existing reviews have sought to understand vendor and pedestrian interaction through a systematic quantitative methodology. This review bridges street vending and walkability literature by reviewing existing research, discussing trends, identifying research gaps and recommending future research directions through a systematic quantitative review methodology.

2. Research Aim, Objectives and Questions

More specifically, this research aims to systematically assess the extent of peer-reviewed academic literature on street vending and its influence on pedestrian experience or behaviour.

The objectives are to: (i) Quantitatively determine the dispersion of literature according to specific and relevant categories and (ii) Identify research gaps that can inform future researchers. To this end, the following questions were asked: (i) What is the geographic extent? (ii) What is the disciplinary scope? (iii) When was the research published? (iv) Which are the most relevant keywords? (v) What are the methods used? (vi) What theories, constructs and concepts have been cited or applied?

The remaining paper will discuss the review methodology (3), method of review (4), analysis of research trends (5), important findings (6), future research directions (7) and conclusions (8).

3. Methodology

A systematic quantitative review follows a 15-step process that has been used across a wide range of disciplines (Cooper et al., 2023; Guitart et al., 2012; Kim & Cuskelly, 2017; Laird-Gentle et al., 2023; Lee et al., 2022; Mahmoudi et al., 2019; Martellotta et al., 2022; Najafi et al., 2022; Parker & de Baro, 2019; Roy et al., 2012; Steven et al., 2011; Takata & Hallmann, 2021; Thomson et al., 2019). This methodology is characterised as being structured, explicit, quantitative, rigorous, comprehensive and reproducible (Pickering et al., 2021; Pickering & Byrne, 2014). The process is broadly subdivided into “*knowledge creation*” and “*text production*” (Pickering et al., 2014, 2021). During “*knowledge creation*”, data on a topic is retrieved from existing literature and structured into a database and then reviewed and summarized using tables. The database is structured using relevant categories derived from the research questions. “*Text production*” involves the analysis and discussion of results and the drafting and revision of each section of the review paper. This approach can be used to evaluate the breadth and depth of a research area and thereby identify research gaps (Pickering et al., 2014, 2021; Pickering & Byrne, 2014).

4. Methods

The search, retrieval and structuring of the data to be reviewed followed a four-part process (Figure 1). First, the literature was retrieved using an appropriate search strategy (4.1). Second, records were screened based on exclusion and inclusion criteria (4.2). Third, further literature was retrieved (4.3) through backward tracking (Mohamed Shaffril et al., 2021; Takata & Hallmann, 2021). Finally, a structured database (4.4) was created based on categories identified from research questions.



Figure 1. Search, retrieval and structuring of data.

4.1 Search Strategy and Retrieval of Data

The search was conducted electronically through two databases, a search engine and backward tracking. The databases used were ProQuest and Taylor & Francis and the search engine Google Scholar. The search used truncated or full search terms (varying according to the sensitivity of the search platform) and were combined using Boolean operators “OR” and “AND”. After some trial and error, the following search terms were selected: “urban”, “street”, “pedestrian”, “experience”, “behaviour” and extensions of the words “vend”, “hawk” and “walk”. The data from Google Scholar was retrieved using Publish or Perish software. The data from ProQuest

and Taylor and Francis were exported as CSV files. The final search was undertaken on 19th December 2022 and a total of 2017 results were retrieved. The retrieved data was copied into Microsoft Excel where 216 duplicates were removed.

4.2 Screening and Eligibility Criteria

The 2020 PRISMA flow diagram was adopted (Figure 2) to systematically assess the literature (Page et al., 2021). The eligibility criteria include only English-language peer-reviewed journal articles. Any articles that did not investigate the influence of street vending on pedestrian experience or behaviour were excluded. Reviews and non-peer-reviewed literature including reports, conference papers and other grey literature were also excluded. Titles and abstracts were screened and when not clear, the full text was also assessed using the eligibility criteria.

Since the first hundred records after the last eligible record from the search engine were ineligible, the remaining records after these hundred records were also excluded. All records from the databases were screened. Of the 211 records thus retrieved, the full text was not available for one article. Of the remaining 210 records, 20 articles were included after screening the full text for thematic eligibility.

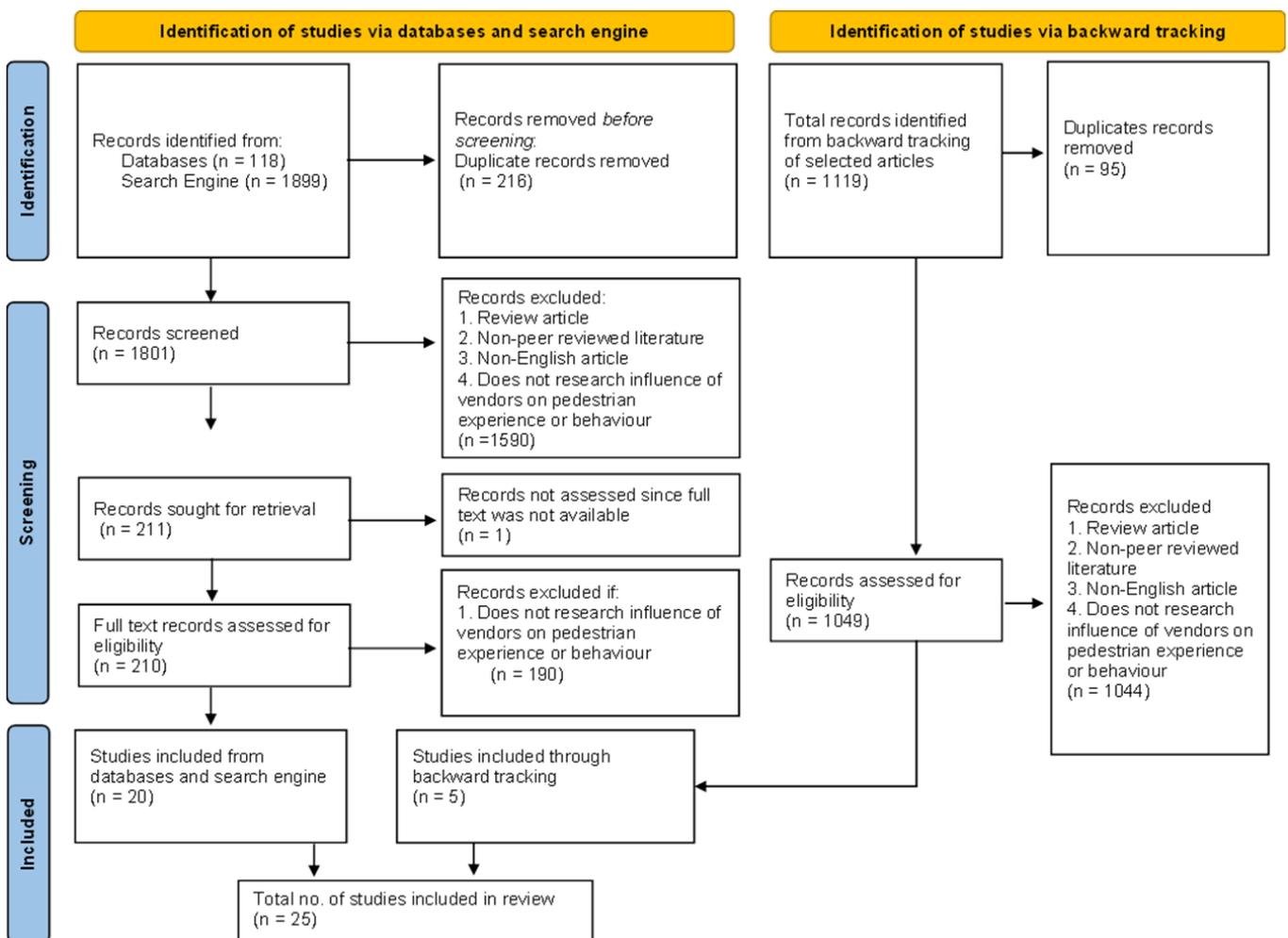


Figure 2. PRISMA 2020 flow diagram.

4.3 Backward Tracking

References from the 20 selected articles were screened for duplicates and eligibility and 4 new records were retrieved. Backward tracking was conducted once more using the new records and one more article was identified. The process was repeated once again, but no new records were identified. A total of 25 articles were retrieved through electronic search and backward tracking.



4.4 Creating the Database

The data extracted from the articles were classified using categories and sub-categories (Table 1) that emerged from the research questions and recorded in a Microsoft Excel spreadsheet. Geographical data was recorded as country(s) where research was conducted (context of research), the author's country of affiliation and the global region the country belongs to i.e Global North and Global South. Global North will hereafter be referred to as GN or North and Global South as GS or South. Data regarding disciplinary scope includes publisher, journal, journal discipline(s), plurality of journal discipline, whether an article studied the themes of experience, behaviour or both and whether the topic was approached as a sub-theme or an exclusive study. Data regarding journal discipline was retrieved from the publisher's website. Timeline was recorded by year of publication. Keywords were grouped using themes (eg: cities, space and time, vending, perception etc.). Data for research methods was recorded based on type of data (quantitative, qualitative or mixed) and details of type and number of data collection and analysis methods. The theories, constructs and concepts, hereafter referred to as TCC were categorized as cited or applied. Those applied were then grouped based on theme. This database was used to analyze patterns and trends of the literature.

Table 1. Categories and subcategories of database.

Research Question	Category		Sub-Category(s)
What is the geographic extent?	Context of research	Country of Affiliation	Global region
What is the disciplinary scope?	Publisher	Journal Experience or Behaviour	Study Exclusivity
When was the research published?	Year of publication		Discipline of journal Cross-disciplinarity
Which are the most relevant keywords?	Keywords used		Keyword theme
What are the methods used?	Type of data		Data collection methods Data analysis methods
What theories, constructs and concepts (TCC) have been cited or applied?	TCC Applied	TCC Cited	Type & Theme

5. Results

Data extracted from 25 peer-reviewed journal articles was analyzed and is reported in terms of geographic extent (5.1), distribution across publishers and journals, exclusivity of study, theme of behaviour or experience (5.2), timeline of publication (5.3), keywords (5.4), methods (5.5) and theories, constructs and concepts cited or applied (5.6).

5.1 Geographic Distribution

The research has been conducted across 14 countries by 58 authors who have affiliations to 17 countries (Figure 3). The maximum research was conducted in India (23%), China (12%) and Japan (12%). There was only 1 (4%) paper each that was researched in Bangladesh, Ethiopia, Greece, Iran, Peru, UK & Vietnam and 2 (8%) each in Tanzania, Thailand & USA. Only one paper (Vichiensan & Nakamura, 2021) was researched across multiple contexts of Japan and Thailand. USA (25%), India (16%), UK (11%), China (10%) and Japan (8%) together make up 70% of the affiliations. 4% and 5% of affiliations belong to Belgium and Netherlands respectively while 3% individually belong to Malaysia, Peru, Tanzania and Thailand. Only 1 affiliation (1%) each exists from Finland, France, Indonesia, Pakistan and Vietnam.

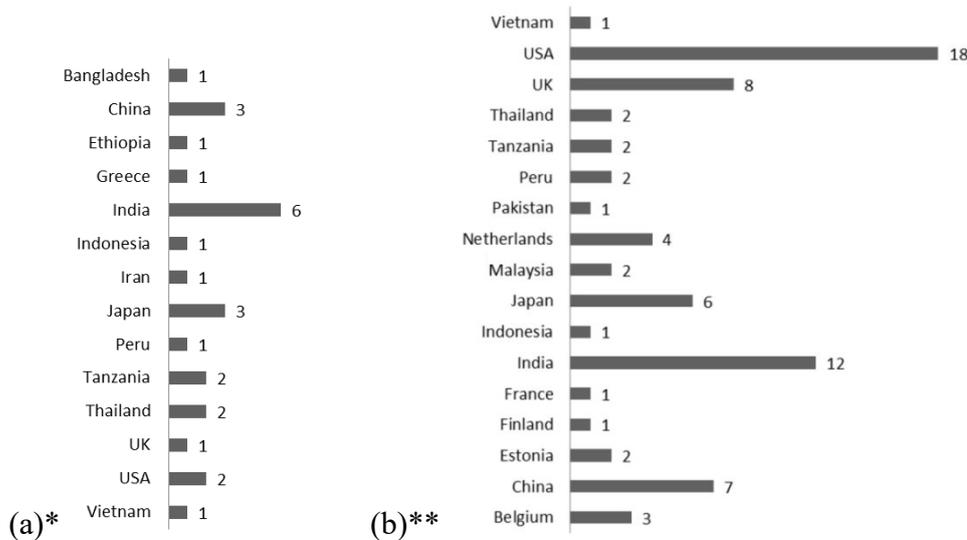


Figure 3. Distribution of research across countries based on research context (a) and author affiliation (b). *Total frequency > 25 as one article researched in multiple countries
 **Frequency >58 since authors are affiliated to more than one country

This review also seeks to highlight unique perspectives by comparing the context of research and author affiliation across global regions. 72% (18) of the research was conducted in the Global South, 24% (6) in the Global North and 4% (1) across both regions, while 40% of the articles had authors affiliated to the GN, 32% to GS and 28% across regions (Table 2). Of the 10 articles affiliated to the GN, 6 (24%) conducted research in the North and 4 (16%) in the South. No articles with affiliations to the South conducted research in the North, rather all 8 (32%) articles conducted research in the South. Similarly, the 7 (28%) articles with affiliations to the North and South did not conduct research in the North, but 6 (24%) articles presented research from the South and 1 (4%) from the South and North.

Table 2. Distribution and mapping of literature across global regions.

Context	Affiliation						Total Frequency	Total %
	Global North		Global South		Global South & North			
	Frequency	%	Frequency	%	Frequency	%		
Global North	6	24%	0	0%	0	0%	6	24%
Global South	4	16%	8	32%	6	24%	18	72%
Global South & Global North	0	0%	0	0%	1	4%	1	4%
Grand Total	10	40%	8	32%	7	28%	25	100%

5.2 Study Exclusivity, Theme and Discipline

Only 10(40%) articles exclusively study the topic, while 15(60%) research as a sub-theme (Table 3a). There is an equal distribution of articles that study either behaviour or experience (44% each). 3(12%) articles research both behaviour and experience.



Table 3. Distribution of research papers according to a) theme and study exclusivity and b) journal discipline. * Frequency >25 since some articles are published in cross-disciplinary journals.

** Does not add up to 100% due to rounding.

a) Study				b) Discipline		
Exclusivity	Experience/ Behaviour	Frequency	%	Discipline	Frequency	%
Exclusive	Behaviour	6	24%	Arts & Humanities	7	15%
	Experience	2	8%	Social Sciences	5	10%
	Experience & Behaviour	2	8%	Engineering	4	8%
Exclusive Total		10	40%	Geography	7	15%
Sub-Theme	Behaviour	5	20%	Built Environment	7	15%
	Experience	9	36%	Planning and Development	7	15%
	Experience & Behaviour	1	4%	Urban Studies	7	15%
Sub-Theme Total		15	60%	Others	4	8%
Grand Total		25	100%	Grand Total	48*	100%*

The research has been published across 20 journals. The journal *Cities* has the maximum number of articles to be published in any one journal (12%), followed by 2(8%) articles each in the *Journal of Urban Design, Sustainability* and *Urban Planning* (Table 4). The remaining journals have all published only 1(4%) article each. Most of the research (32%) is published by Taylor and Francis, followed by Elsevier (16%), MDPI (12%) and Cogitatio (8%). Canadian Centre of Science and Education, David Publishing Company, Emerald, Faculty of Built Environment, University Malaya, OpenEdition Journals, Palgrave Macmillan, Sage Journals and Springer have published only 1(4%) article each.

60% of the articles are published in cross-disciplinary journals. As seen in Table 3b, the disciplines include arts & humanities, social sciences, geography, built environment, planning and development and urban studies which are represented by 7(15%) articles each. 5(10%) articles have been published in journals that fall under the social sciences discipline and 4(8%) each under engineering and other disciplines.

Table 4. Distribution of research papers across publishers and journals.

Publisher	Journal	Frequency	%
Canadian Centre of Science and Education	Journal of Sustainable Development	1	4%
Canadian Centre of Science and Education Total		1	4%
Cogitatio	Urban Planning	2	8%
Cogitatio Total		2	8%
David Publishing Company	Journal of Traffic and Transportation Engineering	1	4%
David Publishing Company Total		1	4%
Elsevier	Cities	3	12%



	Journal of Environmental Psychology	1	4%
Elsevier Total		4	16%
Emerald	Archnet-IJAR: International Journal of Architectural Research	1	4%
Emerald Total		1	4%
Faculty of Built Environment, University Malaya	Journal of Design and Built Environment	1	4%
Faculty of Built Environment, University Malaya Total		1	4%
MDPI	International Journal of Environmental Research and Public Health	1	4%
	Sustainability	2	8%
MDPI Total		3	12%
OpenEdition Journals	Ambiances: International Journal of Sensory Environment, Architecture Urban Space	1	4%
OpenEdition Journals Total		1	4%
Palgrave Macmillan	Urban Design International	1	4%
Palgrave Macmillan Total		1	4%
Sage Journals	Urban Studies	1	4%
Sage Journals Total		1	4%
Springer	KSCE Journal of Civil Engineering	1	4%
Springer Total		1	4%
Taylor & Francis	Senses and Society	1	4%
	International Journal of Urban Sciences	1	4%
	Journal of Urban Affairs	1	4%
	Journal of Urban Design	2	8%
	Journal of Urbanism: International Research on Placemaking and Urban Sustainability	1	4%
	Landscape research	1	4%
	Traffic Injury Prevention	1	4%
Taylor & Francis Total		8	32%
Grand Total		25	100%

5.3 Timeline of Research

Timeline data is presented as publications per year and grouped by 5 years (Figure 4). The research spans 15 years. The first article published by Imai (2008) exclusively researched walking experience and street vending. In 2012, the first article studying both experience and behaviour was published. Three years since in 2015, the first article studying behaviour was published, but as a sub-theme. The research began with publications in the first two years but was followed by a gap of two years. This trend of a two-year research gap after a publication continued till 2015 after which the gap was reduced to one year. There have been consistent publications since 2019. The research peaked in 2017 when 7(28%) articles were published. 4(16%) articles were published during the 1st five-year interval which doubled to 8(32%) during the second interval and 13(52%) during the third interval.

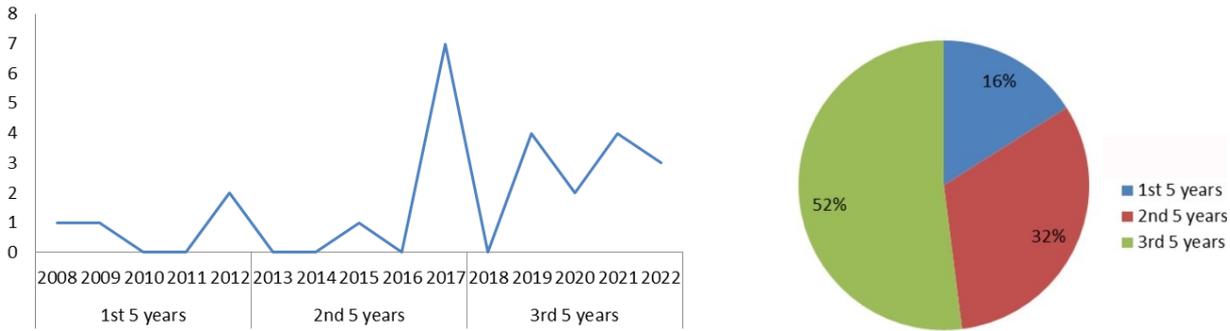


Figure 4. Timeline and distribution of articles every five years since 2008.

5.4 Keywords Used

129 keywords were used across 25 articles. 2(2%) articles had no keywords. Keyword co-occurrence was visualized using VOSviewer software (Figure 5). Keywords were grouped into clusters and linked based on association strength. Each cluster is represented by a different colour. There are 11 clusters, of which 7 are interconnected and 4 isolated. The size of individual keywords and the distance between them represent the frequency of co-occurrence and relative association and thereby the significance of the keyword. Considering these indications, clearly “walking” and “street vending” are the two most significant keywords. Other important keywords are “street vendors”, “India” and “public space”. “Street vending” is linked to keywords grouped around “walking”, “public space” and “India”. However, “street vendors” is linked only to “walking”.

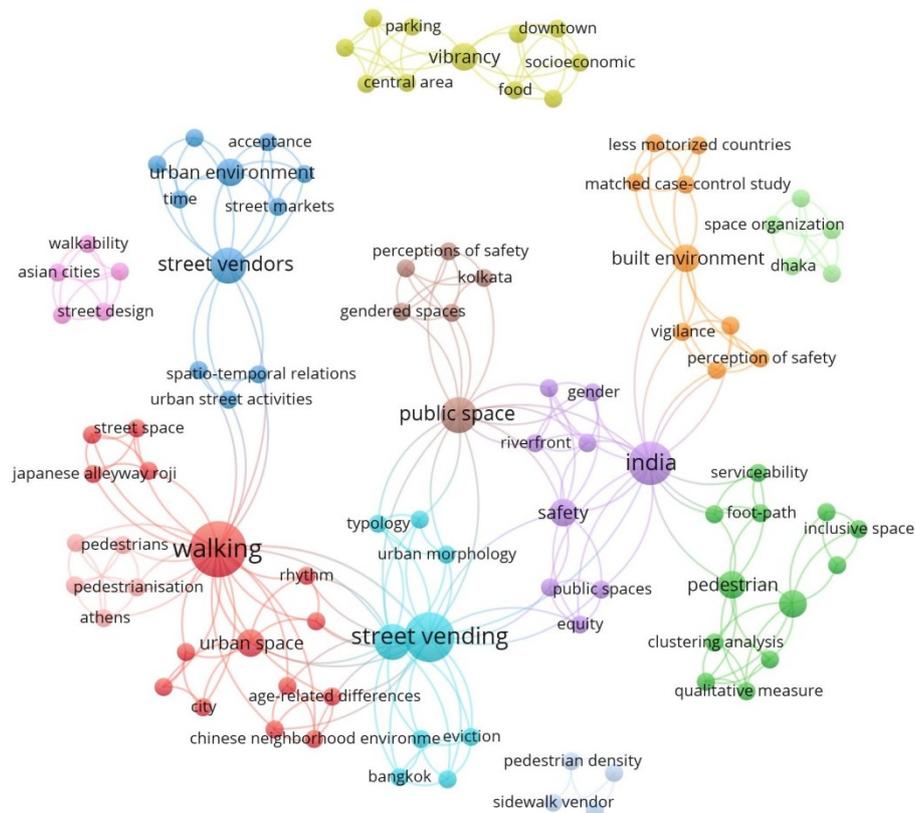


Figure 5. Keywords visualized in VOSviewer.

The keywords were also grouped by the author based on theme as seen in Figure 6. The highest occurring themes are of countries and cities (12%) and pedestrian and walking (12%) followed by theories, constructs or concepts (10%). Public space, vending, methods and streets comprise 9% of the keywords individually. Social factors (7%), built environment (5%) and inclusivity (4%) follow suit. Within the vending group, “street vending” (5) was preferred keyword over “street vendor” (1),



“street vendors” (3) or even “street hawking” (1). Within the pedestrian and walking group “walking” (6) was preferred over “pedestrian” (2), “pedestrians” (1) or “walkability” (1). Keyword occurrences in descending order are “walking” (6), “street vending” (5), “India” (4), “street vendors” (3), “informality” (3) and “public space” (3) followed by “pedestrian” (2) and “built environment” (2). The remaining keywords are all single occurrences. This pattern imitates that of the most significant keyword co-occurrences identified using VOS viewer.

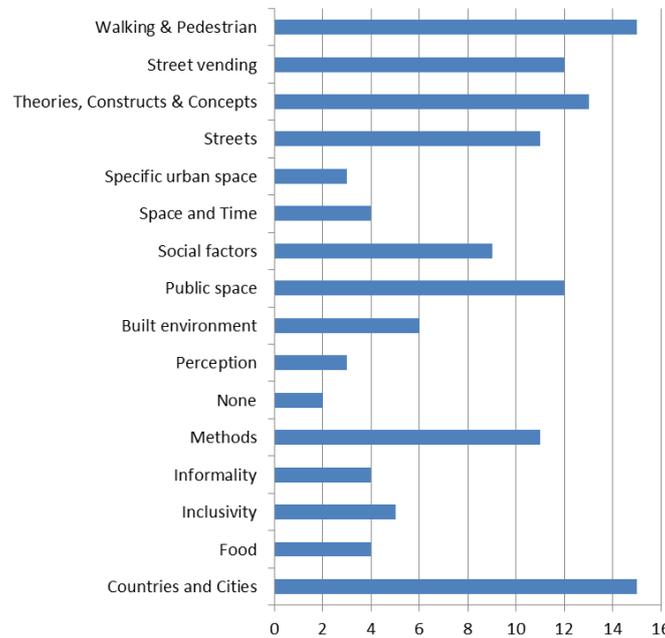


Figure 6. Keywords are grouped according to theme.

5.5 Methods Used

Out of the 25 articles, 15(60%) collected qualitative data, 8(32%) collected quantitative data and 2(8%) mixed data (Table 5). There is an even distribution of articles that study behaviour or experience using quantitative data, while most of the qualitative studies research experience (28%). Only mixed methods are used to study behaviour. The 3(12%) articles studying experience and behaviour used qualitative data.

Table 5. Distribution of type of research data.

Type of Research	Frequency	%
Mixed		
Behaviour	2	8%
Mixed Total	2	8%
Qualitative		
Behaviour	5	20%
Experience	7	28%
Experience & Behaviour	3	12%
Qualitative Total	15	60%
Quantitative		
Behaviour	4	16%
Experience	4	16%
Quantitative Total	8	32%
Grand Total	25	100%

Figure 7 represents the number of methods of data collection and analysis used. Most articles (48%) use two methods of data collection, but only one method of analysis. Only Vichiensan & Nakamura (2021) used 4 analysis methods.

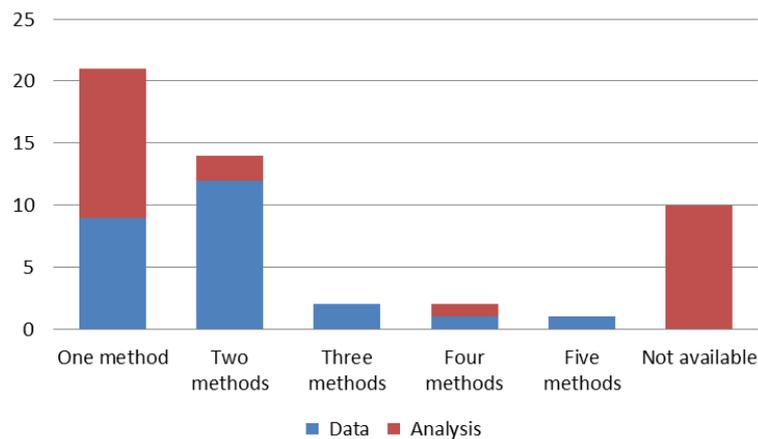


Figure 7. Distribution of the number of methods of data collection and analysis.

10 unique individual methods were used for data collection and 12 for analysis (Table 6). Although all 25 articles reported methods of data collection, 9 (30%) articles did not explicitly report their analysis methods. All of these articles used qualitative data. Focus group was the only method used exclusively for gathering qualitative data, while questionnaires were used to collect only quantitative data. All other methods of data collection were used to gather both quantitative and qualitative data. The most commonly reported method of data collection (used in 11 articles) was semi-structured or in-depth interviews. The interviews collected data on a wider range of aspects such as safety, pedestrian movements and perception of pedestrians or street vendors. Another commonly used method was observation (18%) which was applied to collect data on pedestrian movement. Data on safety and pedestrian movement was also obtained through behavioural mapping (16%). Walking and visual surveys (12%) and photography or videography (10%) were also identified as appropriate methods to collect data related to specific aspects of pedestrian behaviour or experience such as comfort, vibrancy access, and safety. Data on pedestrian's perception was obtained using questionnaire surveys (10%). GIS and ArcGIS (6%) were used to collect built environment data. Focus groups (4%) and archival records (2%) were the least used methods of data collection. Comparative analysis (3%), correlation analysis (7%), descriptive analysis (7%), factor analysis (3%), microsimulation model (3%), multivariable modelling (3%), paired sample T-test (3%), regression analysis (10%) and structural equation modelling (7%) were used to analyze quantitative data. Of the qualitative data studies that reported analysis methods, 10% used spatial analysis, 7% thematic analysis, 3% Lefebvre's rhythm analysis and 1% case study analysis.

**Table 6.** Details of methods of data collection and analysis.

* Frequency > 25 since some articles use more than one method.

Data Collection	Frequ ency	%
Interviews	11	22%
Observation	9	18%
Behavioural mapping, fieldwork notes	8	16%
Walking or visual survey, Point in time survey	6	12%
Questionnaire	5	10%
Photography & Videography	5	10%
GIS/ARCGIS	3	6%
Focus group	2	4%
Archival records	1	2%
Grand Total	50*	100 %
Data Analysis	Frequ ency	%
Spatial analysis	3	10%
Comparative analysis	1	3%
Correlation analysis	2	7%
Descriptive analysis	2	7%
Factor analysis	1	3%
Lefebvre's rhythmanalysis	1	3%
Microsimulation model	1	3%
Multivariable modelling	1	3%
Paired sample T test	1	3%
Regression analysis	3	10%
Structural equation modelling	2	7%
Transcription, coding and thematic analysis	2	7%
Case Study	1	3%
Not available	9	30%
Grand Total	30*	100 %

5.6 Theories, Constructs and Concepts

Kim and Cuskelly (2017) first reported the analysis of theories cited or applied. The scope of this analysis has since been broadened by Takata and Hallmann (2021) and Najafi et al (2022) to include concepts and perspectives. In this review, “cited” refers to when the article mentioned specific TCC but had no evidence that they were tested, while “applied” indicates that a study was designed based on a framework derived from TCC and explicitly applied throughout the research. As mentioned earlier in section 4.4, TCCs were grouped based on themes. Table 7a depicts the distribution of articles that cited and applied TCC and the number of TCC applied (7b). As seen in 7a, only 1 (4%) article neither cited nor applied any TCC. Most articles (48%) applied multiple TCC or a single theory (32%). 16% of the articles only cited TCC. There was a total of 40 TCC applied (Table 7b). However, constructs (70%) were applied more than theories (15%) or concepts (15%). The 6 theories that are applied are “Eyes on the Street”, “Non-Place Theory”, “Sustainable Livelihood Theory”,



“Self-Organizing Pedestrian Movement”, “Out of Place Elements”, and “Lefebvre’s Rhythmanalysis”. All TCC applications can be grouped as attributes of public space (50%), attributes of street vending (23%) or pedestrian experience or behaviour (18%).

Table 7. a) Distribution of articles that cite or apply Theories, Constructs or Concepts (TCC)
b) Distribution of TCC applied

a) Cited or Applied	Frequency	%
Applied		
Multiple	12	48%
Single	8	32%
Applied Total	20	80%
Cited	4	16%
None	1	4%
Grand Total	25	100%

b) Applied	Frequency	%
Theory	6	15%
Construct	28	70%
Concept	6	15%
Grand Total	40	100%

6. Discussion

This section will systematically answer the research questions posed at the beginning of the paper by highlighting the main findings pertaining to the: geographic extent (6.1), disciplinary scope & timeline of research (6.2), most relevant keywords (6.3), methods used (6.4) and theories, constructs and concepts that are cited or applied (6.5).

6.1 The North-South Divide: Conformations & Divergences

Although 28 countries are represented through context and affiliation, the bulk of the research is concentrated within five countries namely USA, India, China, UK & Japan. Nearly half of the research conducted is concentrated in India, China & Japan. There are only 1 or 2 articles that have published research from the remaining 11 countries. India, China & Japan remain visible along with USA & UK because of author affiliations (Figure 3). It is unsurprising that the US and UK figure within the majority as they are considered leaders in academic research (Confraria et al., 2017). This trend is also consistent with other systematic reviews across multiple disciplines that have reported these two countries among the top five affiliations (Guitart et al., 2012; Kim & Cuskelly, 2017; Roy et al., 2012; Takata & Hallmann, 2021). They ascribe one of the main reasons for English being the official language in these countries. While this is true, the greater presence of these two countries and Japan is also reflective of the larger discourse concerning the unequal global distribution of academic knowledge and the North-South divide. However, the greater number of affiliations to India and China is antithetical to this argument. The representation from India, China and Japan may be attributed to 1) interest in the research theme and 2) prevalence of street vending in Asia. China and Japan have also seen positive trends in research funding climate in recent years (Huang & Huang, 2018). The interest from India can be further explained by the fact that India is one of the few countries to regulate and protect street vending (Bhowmik, 2005; The Street Vendors (Protection of Livelihood and Regulation of Street Vending) Act, 2014). This provides scholars with the opportunity to undertake research and encourages street vendors and pedestrians to willingly participate in the research. Also, although English is not the official language in India, it is widely spoken by scholars conducting research, leading to more publications in English-language journals.

The dominating spread of research in the GS and low spread in GN may be attributed to the conception that street vending is predominantly a Southern phenomenon as evidenced by many existing reviews on street vending that focus on the Global South (Bhowmik, 2005; Bromley, 2000; Peimani & Kamalipour, 2022a; Wongtada, 2014). This perception is further evidenced by the large difference between context and affiliation from USA & UK. A quarter of the affiliations belong to



the USA, although only 8% of the research was conducted there. Similarly, the UK represents 11% of the affiliations, but on 4% of the research was conducted there.

The significant occurrence of articles that are affiliated only with GN or across both regions but conduct research in GS can again be attributed to the imbalanced academic production of knowledge between the North and South. Some of these reasons for this imbalance include 1) higher research capacities of Northern countries (Chankseliani, 2023) 2) lack of research funding in GS or more funding in GN (Huang & Huang, 2018; Chankseliani, 2023; Reidpath & Allotey, 2019) 3) “*international academic mobility*” where researchers travel abroad for research and situations where researchers from GS who moved to GN return to conduct research in the home country (Shen et al., 2022; Smeby & Trondal, 2005; Reidpath & Allotey, 2019). The dominance of research in the South and lack in the North by North-South partnerships again reflects the meta-narrative of the global North-South divide and the problems of North-South research collaborations (Binka, 2005; Bradley, 2008; Gaillard, 1994; Jeffery, 2014).

6.2 Existing Literature is Cross-disciplinary, Emerging and Accelerating

Equal distribution across all disciplines (Table 3b) except social sciences, engineering and other smaller disciplines indicates that the topic can generate interest across scholars from multiple disciplines. The positive trend towards cross-disciplinary research is encouraging as this signifies that the topic is complex and diverse perspectives may be considered to generate robust research. The underrepresentation of social sciences is surprising as street vending is very much a societal concern and as Larivière et al’s (2015) finding suggests, social sciences as a discipline have had the highest publications when compared to other disciplines. However, considering that articles studying street vending and walkability were reviewed, this finding does align with that of Shields et al (2021) who reported the need for socially informed studies on walkability.

While Taylor and Francis dominate the publishing scenario, most journals (except for Cities) irrespective of the publishers, have published only 1 article each (Table 4). This fact and fewer exclusive studies indicate that this is an emerging topic in research, though important enough to be studied as a sub-theme. The dominance of research published by Taylor and Francis also indicates that they may have a greater range of multidisciplinary journals. Considering that all the articles reviewed in this research were published after 2000, this trend corresponds with the increase in journals and articles published by Taylor and Francis since the inception of online publications (Larivière et al., 2015).

The commencement of research aligns with the peak in walkability research around 2008 (Shields et al., 2023) signifying a diversification in walkability research at the time. There has been a steady decrease in the frequency of gaps in publication culminating in consistent publications over the last four years. The number of publications has also been consistently increasing, having doubled during the second five-year period and the bulk published in the last five years. So, even though the topic is emerging, it is also rapidly accelerating.

6.3 Research is Contextual

As expected, “street vending” and “walking” stand out as the most dominant keywords. The stronger links and predominance (Figure 5) of “street vending” over “street vendors” and “walking” over “pedestrians” indicate that street vending or walking as an activity is considered more significant than street vendors or pedestrians as social groups. Outlier clusters with no connections to the main network are more likely to be generated from articles that researched the topic as a sub-theme.

New trends which could not be interpreted through the visualisation in VOSviewer have emerged by grouping the keywords by theme. The most interesting of which is the use of keywords related to country or city-specific contexts. This combination of this category of keywords along with those of “pedestrian and walkability”, “public spaces”, “methods”, and “theories, concepts and constructs” will be a useful search strategy for academics wishing to gain new knowledge on the topic. The use



of country or city specific keywords also signifies that most of the existing research is contextual and has generated place-based perspectives.

6.4 Lack of Mixed Methods Research and Future Propensities of Skewed Perspectives

The range of methods used for data collection and analysis is quite varied. The higher proportion of qualitative data is not unusual since Recchi (2020) highlighted the use of qualitative data and case study research to study street vending in her review. However, while it was found that most of the data in this review was qualitative, this study contrasts Recchi (2020) in the aspect of case studies being used for research. This divergence occurs because of differing search strategies that were applied in both reviews yielding varying datasets for analysis.

A large portion of the qualitative studies did not explicitly report the analysis methods. Research that is rigorous in reporting its methods can positively influence research replicability and transparency and is less likely to be questioned about its credibility (Closa, 2021). Such a practice also allows other scholars to reproduce and verify findings in comparable contexts and test the applicability of methodologies and theories in varying contexts (Aguinis & Solarino, 2019). Therefore, there is an immediate need for future researchers to be explicitly detailed while reporting their methods. Closa (2021) highlighted how such a practice would allow the research to be more relevant to a wider audience. Considering the scope of the research is cross-disciplinary, this approach will prove useful. However, considering this same dimension, it is discouraging to note that very few studies employ mixed methods. While quantitative and qualitative studies have their own advantages in answering specific research questions in a field, they are fundamentally different in their approach (Kumar, 2014). The cumulative dependence on a single type of data in the larger research network can generate skewed perspectives in the future.

6.5 The Need for New Theories

Very little theory (Table 7b) is applied in the existing research. All the theories applied can be linked to the domains of public space or place, pedestrian movement and street vending. This is a severe limitation that is further expounded by the trend that most constructs and concepts can also be grouped within the same domains. The relationship between street vending and pedestrian experience or behaviour is very much an urban phenomenon. It is obvious that the research being reviewed reflects this idea since TCC of public space were applied more than those of street vending or pedestrian experience or behaviour. The above conclusions are a clear indication that there is a need for new theories that can interconnect public space, street vending and pedestrian behaviour and experience to be developed. Most of the theories used are also rooted in the global Northern context.

7. Gaps in Existing Research and Future Research Directions

Data from 25 articles studying the influence of street vending on pedestrian experience and behaviour has been systematically reviewed to identify gaps (Table 8) pertaining to geographic extent, disciplinary scope, timeline of publications, keywords and methods used and the theories, constructs and concepts applied.

Table 8. Details of research gaps, recommendations and relevance.

Research Concern	Main Findings	Research Gap	Recommendation	Relevance & Implications
Geographical scope & Keywords	Imbalance of research context and affiliation in Global North	Need for comparative studies between North and South	Case study methodology & North-South affiliations	Nuanced perspectives of the differences and similarities of pedestrian-vending relationships across global
	Dominating spread of research in Global South and	Need for more research from Global North	North-South affiliations	



	the low spread in Global North			boundaries and contexts
	Research is contextual, but negligible research across global regions			
	All the theories applied can be individually categorized under the domains of public space, pedestrian movement and street vending	Lack of applied theory	Integrating assemblage thinking with other relevant theories	Accelerate and broaden empirical research
		Lack of theory related to the specific knowledge domain	Using assemblage thinking as a research methodology	Expand the range of theoretical applications that can interconnect public space, street vending and pedestrians
Theory, Methods, Timeline & Disciplinary scope				Develop new theories pertaining to the research area
	Only 6 theories are applied. Existing research is highly contextualized	More perspectives from social Sciences are needed	Grounded theory, case study and mixed methods in integrative or singular forms	Can address cross-disciplinary research
				Generate comparative and multi-contextual data
				Aid in nuanced interpretations of upcoming research

7.1 Misconception about Street Vending and Implications for Multi-contextual Research

Many scholars direct their efforts towards the Global South when researching street vending (Bhowmik, 2005; Bromley, 2000; Deore & Lathia, 2019; Dovey et al., 2022; Hagos et al., 2020; Peimani & Kamalipour, 2022a, 2022b; Sun, 2021; Sun et al., 2020, 2021; Tafti, 2019; Wongtada, 2014; Yatmo, 2009), creating the conception that street vending is a phenomenon of Southern import. However, street vending is globally primarily considered as a source of income and means of survival (Recchi, 2020). There are consistent occurrences of street vending in wealthy nations too, especially among migrant communities and the unemployed, manifested by the recent increase in migration to developed countries and economic downturns (Martin, 2014; Piazzoni, 2022; Recchi, 2020; Tonnelat, 2007). Recent works from the Global North although few and far between (Devlin, 2019; Martin, 2014; Newman & Burnett, 2013; Piazzoni, 2022; Recchi, 2020) are serving to amend the misconception of street vending as a Southern phenomenon. However, there is still a lack of research that has been conducted in the Global North (Table 2) and even fewer studies exist across global regions. The existing research has already generated contextual data rooted in place, although from mostly single locations. I believe this trend of contextual studies can be leveraged and resonate with Recchi’s (2020) and Peimani et Kamalipour’s (2022a) suggestions that more comparative studies be undertaken across regions. I especially recommend studies across the North-South context



to gain more nuanced perspectives of the differences and similarities of pedestrian-vending relationships across global boundaries. This can be better achieved by employing a case study methodology and North-South affiliations. While I am aware that such partnerships are complex and may not always be equal (Binka, 2005; Bradley, 2008; Gaillard, 1994; Jeffery, 2014), it is beyond the scope of this review to discuss the details of such partnerships or possible solutions thereof.

7.2 Implications for Cross-disciplinary Research, Theory and Methodology

By identifying and categorizing constructs, concepts and theories used in existing research, this review has identified the lack of theory related to pedestrian-vending relationships. The position so far has been to treat street vending and walkability as two separate entities that theoretically don't engage, though, in everyday life, they do. There is a need to accelerate and broaden empirical research and expand the range of new theoretical applications that can interconnect public space, street vending and pedestrians. New theories can become frameworks that are applied to answer important questions pertaining to the influence of street vending on pedestrian experience and behaviour. Since the research is as emerging one, imminent work in this direction would aid in developing more nuanced interpretations of upcoming research.

Assemblage thinking has previously been suggested by Dovey (2012) to study informal urbanism and Peimani and Kamalipour (2022a) as a theoretical framework to study street vending. However, the debate around assemblage thinking is complex and evolving with varying arguments by scholars about its implementation and appropriateness in urban studies (Acuto & Curtis, 2013; Anderson et al., 2012; Brenner et al., 2011; Dovey, 2011; Dovey et al., 2018; Farias, 2011; Kamalipour & Peimani, 2015; McFarlane & Anderson, 2011; Taufen et al., 2022; Wachsmuth et al., 2011; Yadollahi, 2017). I explore Peimani and Kamalipour's suggestion further to understand the implications for studying the topic of this review using assemblage thinking by evaluating two articles that have applied assemblage thinking to discuss street vending.

Using assemblage thinking, pedestrians and street vendors can fit into the larger network of heterogeneous agents that generate urban processes (Dovey et al., 2018; McFarlane & Anderson, 2011). Previous research (Tafti, 2019) that applied assemblage as an ontology to explain the transformative nature of street vending in specific contexts, while successful in navigating the complexities of the relationship between street vendors and other urban entities, did not explicitly report details on the role of pedestrians in the network. I attribute this to a lack of a theoretical framework and the consideration of pedestrians as mere passers-by rather than as an engaging force in the assemblage. Dovey et al., (2022) are more successful in this regard when they try to answer the question of what factors may be interconnected to and influence street vending in the urban realm. They do not consider assemblage thinking as a theory, but simply as a tool for engaging with urban space at multiple scales (Dovey et al., 2018, 2022). Although they consider the relationship between the intensity of street vending and pedestrian flows as axiomatic, they still aid this thinking with constructs derived from literature and apply a conceptual framework throughout the research. In doing so, they were able to develop substantially deeper interpretations of data concerning the network of street vending and other urban factors including pedestrians. Therefore, I believe that it is important to integrate relevant theoretical or conceptual frameworks when using assemblage thinking to study the topic of this review.

There is still, however, a need to address the lack of theoretical knowledge and empirical studies exclusive to the research area. I recommend applying grounded theory, case study and mixed methods in integrative or singular forms.

Although the topic of this review is cross-disciplinary, very few studies use mixed methods. This poses a challenge as research conducted within silos of an individual discipline may have a predisposition of accepted research paradigms and thereby not fully explore all perspectives of the study. The mixed methods approach is paradigmatically plural and provides the opportunity to develop richer data and more nuanced perspectives of complex topics by combining the strengths of both quantitative and qualitative studies and negotiating the differences generated thereof (Cresswell,



2022; Creamer, 2022; Kumar, 2014; Doyle et al., 2009; Greene, 2005; Teddlie & Tashakkori, 2012). This approach can also be applied across a diverse range of topics, making it suitable to study the topic of this review.

Case study research can provide the holism required to investigate the topic as it provides the opportunity to conduct thorough, in-depth investigations, generate comparable empirical data and explain phenomena and causal links across multiple contexts (Yin, 2018; Kumar, 2014; Groat & Wang, 2013; Walton, 1972). This approach is highly flexible and when applied singularly (Eisenhardt, 1989, 2021) or integrated with mixed methods (Carmona, 2015; Cook & Kamalodeen, 2020) can generate data and theory concerning complex topics that are rooted in place.

Street vending is a dynamic and transformative process, calling for a holistic approach of study. Grounded theory can be used to document this quality, develop contextual theories and explain associations. Grounded theory is not a new approach to theorising street vending (Jamme, 2023; Keswani, 2019; Uddin, 2021; Zamani & Babaei, 2021). This approach can aid in generating theory embedded in data (Charmaz, 2006) and be applied across multiple disciplines, making it ideal for cross-disciplinary research (Creamer, 2018; Milani & Hashemi, 2020). The mixed methods-grounded theory approach can combine the advantages of methods predominant in individual disciplines to develop more “*complex*” and “*multilayered*” theories (Creamer, 2018; Guetterman et al., 2017; Milani & Hashemi, 2020). Case study integrated with grounded theory (Fernandez & Lehmann, 2011; Lehmann, 2010) has been previously applied in IS research and can be used to generate new theories in emerging research areas such as the topic of this review. To the best of my knowledge, this methodology has not been applied in urban studies so far. However, this approach can help answer questions about specific developments within and across contexts, generate contextual theories, and highlight similarities and differences between the Global North & Global South. This approach can also generate comparative perspectives rooted in diverse contexts (Robinson, 2016; Ren & Luger, 2015) that become useful in developing theories. Applying grounded theory, case study, and mixed methods in integrative forms has the potential to “*rupture*” (Walsh, 2015, pp 531) existing theories and challenge the predominant flow of knowledge from Global North to South.

8. Conclusion

This paper has evaluated 25 peer-reviewed English articles studying the influence of street vending on pedestrian experience or behaviour using a systematic quantitative review methodology for the first time. The findings of the review have been analyzed to assess the limitations and gaps of the existing research and recommend directions for future researchers. It has been found that the research, although in its nascent stages, is cross—disciplinary and rapidly accelerating, especially in the Global South. However, research conducted in the Global North is comparatively lesser. These findings, while serving as limitations in some ways, also present opportunities for future research. The most apparent limitations are the clear lack of multi-contextual perspectives and lack of research from the Global North which can be improved through affiliations between the North and South and case study methodology. Few attempts have been made to bridge the boundary between research on street vending and that on walkability in the past 15 years and there is still a pressing need for richer empirical data exclusive to the research area. While assemblage thinking can be operationalized to achieve this, there is first a need to develop new theories exclusive to the research area to be developed. Adopting an integrative approach of grounded theory, mixed methods and case study methodologies can aid in developing more nuanced multi-contextual understandings of the influence of street vending on pedestrian experience or behaviour.

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