Identifying notions of environment in obesity research using a mixed-methods approach

Elgaard Jensen, Torben; Kleberg Hansen, Anne Katrine; Ulijaszek, Stanley; Munk, Anders K.; Madsen, Anders Koed; Hillersdal, Line; Jespersen, Astrid Pernille

Published in:
Obesity Reviews

DOI:
10.1111/obr.12807

Publication date:
2019

Document version
Peer reviewed version

Identifying Notions of Environment in Obesity Research Using a Mixed Methods Approach

Torben Elgaard Jensen[1], Anne Katrine Kleberg Hansen[2], Stanley Ulijaszek[3], Anders Kristian Munk[1], Anders Koed Madsen[1], Line Hillersdal[4] and Astrid Pernille Jespersen[2]

[1]Aalborg University Copenhagen, Department of Learning and Philosophy, [2]University of Copenhagen, The Saxo Institute, [3]University of Oxford, School of Anthropology and Museum Ethnography, [4]University of Copenhagen, Department of Anthropology.

Identifying Notions of Environment in Obesity Research Using a Mixed Methods Approach

Abstract

The research field of obesity and environment has been variously framed in a-priori ways in grid-like and/or hierarchical form. Network analysis allows a new way of considering the relationality of this field. We use machine reading, network analysis, semantic analysis and qualitative analysis of 414 highly-cited publications on environment and obesity between 2001 and 2015 to produce a network map which exhibit five distinct notions of environment, all of which are active in the field of obesity research. These are: institutional, built, food, family, and bodily. They do not come togther as a single well-defined and well-described system , but overlap, interpenetrate and leave gaps. Examination of the degree to which research into obesity and environment can be understood as coherent or coordinated, shows that the field can be interpreted variously as: being simultaneously integrating and disintegrating; a partially coherent hierarchy; and/or a pattern of simplification and complexification. Future analyses incorporating larger datasets and a longitudinal comparison should give further information on the merit of each of these three interpretations.The map is proposed as a navigational tool for policy actors to coordinate efforts between stakeholders and for researchers to coordinate research plans in light of different positions in the field.

Introduction

In the past two decades obesity research has increasingly moved from studying isolated factors to adopting ecological views of the coherent complex of factors that may condition obesity (1). A key

role in this development has been played by Swinburn et al. (2), who in 1999 introduced the notion of *obesogenic environments*, which they defined in their words as 'the sum of influences that the surroundings, opportunities, or conditions of life have on promoting obesity in individuals or populations'. In addition to this definition, Swinburn et al. proposed the ANGELO framework (analysis grid for environments linked to obesity) - a 4x2 grid that 'dissects' the obesogenic environment into a number of factors. Along one dimension, the environment is split into four types: the physical, the economic, the political and the socio-cultural. Along the other dimension, environments are dissected into two sizes: micro and macro.

Swinburn's notion of obesogenic environments has inspired significant research into obesity ecology and it has turned attention to combinations of environmental factors such as the preponderance of motorized transport, sedentary occupation, and cheap and energy-dense food (3). Among policy-makers, especially in the United Kingdom, the concept of obesogenic environments has been used to frame obesity as a societal challenge requiring a broad coordinated effort [4-7]. In this context, the notion of obesogenic environment has become a vehicle for joining up government and research for collective effort (8). In the wider world, the notion of obesogenic environment has also caught on as a way of grasping that the current rise in obesity rates is rooted in ways of life broadly, rather than with any particular factor (9). Recently, Swinburn's notion, and more the specifically the ANGELO grid, have been used to review the field of obesity studies (10). This review talks of an 'explosion of obesogenic environment research' and identifies no less than 146 primary studies. But despite of this, it concludes that several cells in the ANGELO grid are sparsely covered.

The rise of ecological thinking in relation to obesity, as exemplified by the notion of obesogenic environments, may be indicative of a general willingness to collaborate and combine knowledge. But this does not mean that coherence and coordination is within easy reach. On the

contrary, policy approaches to control or regulate aspects of such environments appear to be very difficult to coordinate, since they involve a wide range of stakeholders (11-17). It is not unlikely that policy actors and other stakeholders have very different ideas about the issue of obesity, despite common adherence to the idea of making a coordinated effort to make environments less obesogenic. Despite the relatively broad-scale adoption of the term obesogenic environment, the growing field of obesogenic environment research field may not be summed up by Swinburn's original grid.

A good deal of obesity research has an ecological perspective, much of it being directly inspired by the Swinburnian notion obesogenic environment. But there is little reason to presume that all research on obesity and environment adheres to it in a strict sense. In this analysis we attempt to understand how environment is considered in obesity research, and the degree to which this effort can be understood as coherent or coordinated, using a mixed methods network analysis approach. From the abundant scientific literature on obesity-related issues, we collected a large number of highly-cited articles that specifically address obesity and environment. Within this corpus of articles, we have systematically explored the different ways in which the notion of environment is used, by developing and applying a mixed methods design (18) that involves machine reading and semantic analysis of an extensive literature on obesity and environment using a terms-extraction algorithm, visual network analysis of co-occurring terms, and qualitative analysis of the resultant network map.

The network map, we propose, is a navigational tool that researchers can use to help them understand their work in relation to other positions within the field of obesity and environment. The map should also be of use to policy actors who wish to overview and coordinate efforts between differently positioned stakeholders. The map may be a starting point for broader reflections on the configuration, differentiation and coherence of obesity research more generally.

Methodology: A computation-based mixed methods design

The mixed methods design used to produce a map of discursive regions of obesity and environment (a particular way of framing obesity as indicated by a tendency to use particular sets of terms) involved three specific goals. First, the method was designed to investigate the practices of the most influential authors in this scientific field. We therefore built on a dataset of recent and highly-cited articles in the most widely recognized interdisciplinary publication databases. The second goal was to articulate the less visible qualitative differences among influential authors in the field. We therefore used a quantitative word extraction algorithm that prioritizes differences rather than commonalities. The third goal was to explicate different notions of environment within this body of literature . We therefore investigated each of the discursive regions qualitatively to identify their underlying assumptions, and to determine the relationships between the clusters. Our division of labour was as follows: Jensen and Hansen were responsible for the data preparation work (assessment of article relevance). Munk and Madsen were responsible for the quantitative data analysis and production of the network map. Jensen, Hansen, Ulijaszek, Hillersdal and Jespersen were responsible for the qualitative analysis. All authors read and contributed to the final text.

Building the dataset

The literature corpus comprised of 500 highly-cited papers on obesity and environment from between 2001 and 2015. The starting point, 2001, was chosen because the publication that coined the term obesogenic environments (2) began to play a role in the literature around this time. The choice of end point, 2015, was pragmatic and organizational, being the latest full year before the authorship could undertake the analysis. We settled for 500 papers because they represent, in our

estimation (see below), roughly a third of the total volume of papers on obesogenic environments from that time period. We have made the assumption that the most cited third of this total volume of publications would allow us an overview of the main themes in the field across this period. The articles were sourced from Web of Science (WoS) and Scopus, which are by far the two largest and most widely recognized cross-disciplinary research publication databases in the English-speaking world. The two databases were chosen because we expected them to offer the best reflection of the practices of the dominant and most institutionally recognized actors in the field of obesity research. Scopus and WoS both have a significant bias toward English-language literature and toward the fields of biomedical science, natural science and engineering (19). Despite these biases, the databases also contain a large number of journals from the social sciences and humanities, which appear in our sample of highly-cited articles. The analysis undertaken did not allow an examination of whether or not social sciences and humanities talk about environment differently, but this could be done with larger datasets in the future. The likely bias of these databases might be viewed as a source of error, but the particular selection of articles in these prestigious databases also helps in discovering the prevailing discourses among the most powerful actors in the field (20). This is an issue for our research, but also more broadly for all obesity science, as the platformization of the internet structures what can and cannot be found, in the scientific literature and more broadly. In a similar way, our choice of selecting highly-cited articles, rather than randomly sampled articles or a fixed number of articles from each year, reflects our intention of identifying a broad spectrum of the most influential and broadly recognized notions of obesogenic environment. However, this sampling strategy works to the disadvantage of relatively small disciplines that have little influence on the field in general.

On a more pragmatic level, data sampling had to take account of the differences in coverage between Scopus and WoS. While both WoS and Scopus are stable enough in volume across

journals and over time for cross-disciplinary and longitudinal comparisons (23), their coverage has also been found to diverge, with Scopus generally covering more journals and disciplines in a less systematic way than WoS (24, 25).

The search was carried out in February 2016. From WoS we produced a ranked list of 1044 papers by querying the 'topic' as *obesity*, the 'title' as *environment*, and restricting the search to *articles.* From Scopus we produced a ranked list of 891 papers published between 2001 and 2015 by querying 'article title, abstract or keywords' as *obes**, 'article title' as *environment*, and 'document type' as *article.* Since Scopus and WoS do not offer the same search interface, it was necessary to use different search strings to approximate the search results on the two platforms. As Scopus has a tendency to estimate a higher number of citations than WoS for the same article, we could not simply merge the two lists to retrieve the 500 most cited papers without skewing the selection in favour of Scopus results. Since we wanted full text copies of the articles, we also had to work within the boundaries of the access granted by our library (Aalborg University Library). We therefore decided to retrieve the most cited fully accessible papers from each of the two lists, checking for and eliminating duplicates as we went along, until reaching a total of 500 papers.

Figure 1 shows the distribution of papers by year of publication. As expected, recently published papers were not yet widely cited and were therefore less prevalent in the set. The scarcity of papers between 2001 and 2005, however, can both be due to a lack of published material on the topic of obesogenic environments, or a result of papers not being cited very much in that period. To ensure that all papers were on topic, we assessed them manually, reducing the corpus from 500 to 414 papers. This reduction of the set did not significantly alter the distribution of papers over time (Figure 1). In the final sample, the number of citations to each paper ranged between 17 and 800. A full list of the 414 articles included in our sample can be found in the supporting information for this article.

[insert Figure 1]

Figure 1: Distribution of papers before and after manual cleaning.

Semantic analysis of the corpus

We used the open source software, CorTexT (24) to obtain a ranked list of multi-terms from the corpus through successive stages of semantic analysis. The first of these stages is known as Part of Speech (PoS) Tagging. PoS tagging analyses the sentence structure to attribute a word class to each of the terms found in a sentence (noun, verb, adjective, adverb, etc.). Having performed PoS on the corpus we were able to build a list of all noun phrases (combinations of nouns and adjectives) found in the corpus (this process is known as chunking). After automatically correcting orthographical errors and lemmatizing each term to its stem, noun phrases that are identical on the stem level were merged. For instance, the phrases 'diet quality', 'quality diet' and 'quality of the diet' were merged as 'diet quality'. If a shorter multi-term was nested in a longer multi-term, the longer multi-term was prioritized. For instance, if choosing between 'diet quality' and 'high diet quality' as a phrase, the latter would be prioritised. We set the maximum multi-term length at 4. This was a qualitative decision taken after reviewing the results of setting the length at 2 and 3, which turned out to force artificial cuts in many of the multi-terms, as for example 'quality of the diet'. We then proceeded with a ranking procedure aimed at prioritizing the terms that carry the most *specific* information about the research question. By specificity we mean terms that appear with a high frequency in a small part of the sample – as opposed to generic terms that are used evenly in all parts of the sample. As we explain the following, the ranking according to specificity was based on the calculation of a so-called specificity score. The procedure was as follows: we first counted the frequency of each multi-term in the corpus and set a minimum frequency to reduce the list. Because

we were interested in the discourse that is *particular* to a specific subset of papers on obesity and environment rather than the discourse that is generic to all papers on obesity and environment, we set the minimum frequency to 3 documents, indicating that a multi-term must be present in at least 3 different papers in order to be considered. We then calculated the specificity score of the remaining multi-terms (25). Specificity presumes that terms generic to all papers will exhibit an unbiased distribution across the corpus and will be therefore irrelevant to this analysis while, conversely, the terms that occur in specific parts of the corpus are relevant because they help show differences in notions of environment across the field. For instance, if 'diet quality' occurs frequently in 50 papers but is never found in the rest of the corpus it will receive a high specificity score, where as if it occurs with equal frequency in all the papers it receives the lowest specificity score. In this way, we calculated how much the distribution of each multi-term across the corpus deviated from its unbiased distribution (chi-squared) and ranked the multi-terms according to how much they deviated – that is according to their specificity.

Finally, we produced a list of the top 500 most specific multi-terms. The size of the terms list (500 items) was chosen based on several iterations in CorTexT with smaller and larger lists. The number 500 was a pragmatic choice between shorter lists that appeared to leave out several relevant multi-terms (e.g. 'ecological models' and 'food outlet density), and longer lists that appeared to include large amounts of superfluous terms (e.g. 'high levels' and 'age and gender'). CorTexT allows the terms list, including the ways in which terms are stemmed and merged, to be edited. One significant artefact of our dataset was the names of authors and journals that figured prominently in the extracted list of high-specificity multi-terms. Given that this information is already contained as metadata associated with each paper and tells us little about the ways in which the topic of obesogenic environments is framed, we decided to filter out author and journal names from the terms list. We also manually cleaned out a small number of overly generic terms that were not

captured by CortexT's specificity filter (e.g. 'corresponding author', 'email address' and 'research agenda').

Visual network analysis

To identify discursive patterns in the corpus (i.e. specific styles in the way obesity and environment are talked about), we produced a network of co-occurring multi-terms, within the same article. If two different multi-terms were used in the same article they would be connected by an edge (or a line, in everyday usage) in the network. The more frequently two terms co-occur, the heavier the edge becomes. A heavier edge is visually represented as a thicker line in the network. We filtered out the weakest edges to improve the clarity of the visualisation. CorTexT facilitates this by engaging a distributional measure that normalises the weight of an edge on the global connections of its two nodes. Edges between nodes with a high likelihood of being connected (because they are already globally well connected) must be heavier to be taken into account in analysis than edges between nodes with low likelihood of being connected.

The visual layout of the network (Figure 2) was obtained by spatialising the nodes with a spring based (or force vector) algorithm (26). This introduces a repulsive force between all nodes and allows the edges to act as springs holding connected nodes together. Heavier edges act as stronger springs, causing frequently co-occurring terms to be held more closely together than less heavy edges. Visual proximity between nodes can therefore be interpreted as their tendency to be used in the same contexts (in our case papers). Conversely, distance between nodes can be interpreted as the extent to which they are rarely (or never) used in the same context. Clusters of closely connected terms can be interpreted as a subset of papers with a tendency to frame discussion of the notion of obesity and environment in the same way. These clusters are what we refer to as

discursive patterns, because the presence of a cluster shows a recurrent practice of using particular terms together that is distinctive to a certain subset of papers within the dataset.

To aid the visual identification of clusters, community detection (i.e. the search for interconnected clusters of co-occurring themes) was performed using the Louvain method (27). This method explores different ways of partitioning the network until it finds the solution with the highest modularity score. A higher modularity score is obtained by minimizing the number of edges that cross between partitions. The nodes are coloured based on this partition, and nodes of the same colour can thus be interpreted as belonging to the same community of frequently co-occurring terms. The choice of colour carries no meaning. The supporting information for the electronic version of this article contains a zoomable overview map as well as magnified pictures of each of the clusters in the map.

[insert Figure 2]

Figure 2. Network map of the discursive patterns in 414 articles related to environment and obesity research.

Qualitative analysis of the map

Each cluster in Figure 2 represents a discursive region. The aim of the qualitative analysis was to explicate these 'ways' or more precisely the underlying notions of obesity and environment and the figures of thought that appear to guide researcher's choices of how to frame and speak about their research.

To structure our qualitative analysis, we posited that any particular notion of obesity and environment could be characterised by describing three key elements: (a) the kinds of elements and processes that constitute the environment ; (b) the kind of 'object of research' which is believed to

be contained and influenced by that environment; and (c) the presumed mechanisms of interaction between object and environment. This simple conceptualization was used both to guide our qualitative analysis and to summarize its results.

The qualitative analysis was conducted as a three-step-process. Firstly, we assessed the terms in each cluster as they appeared on the map in order to generate preliminary descriptions of the environment, object of research and mechanism of interaction specific to each cluster. Those preliminary descriptions were then checked against the underlying article corpus typical for each cluster. If confirmed, illustrative articles were searched for, to serve as examples in the description of clusters. Secondly, we compared the identified environment, object of research and mechanism of each cluster to other clusters, clarifying how they differed from, and/or were related to each other. In this comparison, the edges connecting the different clusters on the map were used as indicative of the differing extent of shared notions between the clusters. In some cases, the second step called for an iteration of step one. Thirdly, the qualitative analysis was condensed into short descriptions focused on the notion of environment, the object of research, and the mechanism of interaction for each cluster.

In general, the qualitative analysis pursued an iterative approach in which the starting point was always the map and its clusters, terms, colours and edges. Whenever the map needed further interpretation, or whenever preliminary assumptions needed to be substantiated, the underlying corpus of articles was consulted.

Results

Five notions of obesogenic environment were identified: institutional, built, food, family, and bodily (Figure 2 and Table 1).

[insert table 1]

Table 1. Five environments related to obesity, including their objects of research and key mechanisms of interaction.

Institutional environment

The environment in this cluster consists of *institutions* – predominantly schools and other organisations providing child care. The object of research is *institutional food services* as these appear in regulated food environments, and the mechanism of interaction is *policies and their implementation*. The centre of concern and regulation are school lunches and to some extent other meals. Many of these studies originate in countries with state funded or state subsidised school meals (e.g. (28)). Studies can both examine existent supply of, or interventions into, institutional food services.

Articles typical to this cluster contain a number of terms that specify the environment or the object of research. The object is specified with terms such as “school meals”, “vending machines”

"sugar sweetened beverages", whereas the environment appears in the form of institutions and regulatory bodies such as "Department of Agriculture", "Department of Health" or "school districts" which are stakeholders in the making of institutional food policies. Specific policies (the mechanism of interaction) are also mentioned - for instance "dietary guidelines".

The foods named are often calorie-dense highly processed products such as "french fries", "snack bars" and "ice cream", making them easy to single out as risk foods and targets for intervention. A smaller, less pronounced theme is that of "physical education", which also appears in this cluster. In all, the cluster points to policy efforts towards making schools and institutions into sites for obesity prevention.

Built environment

The built environment cluster is concerned with the physical surroundings of humans – especially as designed and built, and how this influences energy expenditure, which in turn influences population health (e.g. (29)). Its focus is overwhelmingly on measurement and reporting. It differs from the institutional environment, which largely describes the regulatory context in which schools provide food for children. The key object of research of the built environment cluster is *population obesity*, which is predominantly defined and measured by Body Mass Index (BMI) and sometimes by other anthropometric measures such as skinfold thickness (e.g. (30)). The key mechanism of interaction is *energy expenditure* through physical activity.

The primary focus of this cluster is to define, measure and test a number of different aspects of the built environment that might influence the levels of physical activity of people in it. Studies included in this analysis either examine the existing outlay of environments or report from interventions into it. A common background assumption is that the current infrastructure planning has favoured passive modes of transport, such as cars, trains and escalators (e.g. (31)). Articles also

focus on how the neighbourhoods that promote the integration of physical activity into everyday life activities – such as walking to the grocery store instead of driving. The articles featured in this cluster place emphasis on relationships between place and obesity, as well as on place and health behaviours which might lead to obesity. An often-used research design is to compare "neighbourhood walkability" of cities as measured by built environment features such as "street connectivity", "recreation facilities", and the availability of "green spaces", the "air quality" or the "physical activity" of its residents (29, 32, 33). Other features of the urban environment, such as "traffic safety" and "crime safety", are also used as bases for comparative studies and as potential mediators of physical activity behaviour.

Food environment

Articles typical to this cluster focus on themes related to the *food environment*, which differs from the institutional environment in that it is concerned with the general availability of food in non-institutional contexts. It is assumed to interact with *population obesity* - the object of research - through the interaction mechanism of *energy uptake*. Food environment is often measured in terms of the immediate availability of food in the near neighbourhood, as signified by terms such as neighbourhood food environment" or "local food environment". Obesity is typically measured by BMI (e.g. (34)). These articles examine a broad range of phenomena, which are presumed to influence energy uptake. Calorie uptake is often not measured directly but rather indirectly assessed through studies of the availability, content and quality of the food in the immediate neighbourhood environments, or by measuring the spatial accessibility to "fast food restaurants", "full service restaurants", types of "grocery stores", "convenience stores" and others (e.g. (35)). Other studies examine the availability of particular food items such as "fresh fruit and vegetables" (e.g. (36)). Neighbourhoods with notably poor availability of healthy foods or food outlets are sometimes described as "food deserts" with detrimental health outcomes (e.g. (37)). The food environment cluster includes a more predominant focus on socio-economic status than the other clusters, which is indicated by terms such as "health disparity", "neighbourhood poverty" and "social cohesion" (e.g. (38)). In general, the interaction mechanism of energy uptake plays a key role in most of the articles typical of this cluster.

Family environment

This cluster is concerned with the environmental features defined by parental regulation and the family home. In this case, the object of research is *population obesity in children and adolescents*, which is typically measured by BMI. The key mechanism of interaction is *energy expenditure and*

intake, which is influenced by family practices such as eating habits, diet, physical activity and sedentary behaviour. These practices are indicated by terms such as "screen time", "home food environment", "parental influences", "food choice" and "fruit and vegetable intake". "Maternal education" maps alongside "parental education", there being no independent mapping for fathers. The cluster focuses on both supply- and demand-sides of energy balance, setting it apart from the clusters that only focus on supply (food environment) or demand (built environment). It shares a similar focus on children and youth as the institutional environment.

Within this cluster, there is an additional research interest in the long-term effects of early life on the health outcomes in adulthood and old age. This life course perspective often informs obesity prevention polices that target family environments (39).

In sum, the articles typical of this cluster explore a broad range of family environment features that are assumed to influence energy intake and expenditure, and consequently the production of obesity among the younger generation. As this particular subset of the population also comprises the future adult population, this cluster is concerned with interventions directed at existing obesity levels in children and adolescents as well as with long term obesity prevention.

Bodily environment

In this cluster, the environment is an internal physiological one, unlike all the other clusters. The object of research is *deposition of fat in the human or rodent organism*, a process that can potentially lead to obesity. Fat deposition is influenced by several types of interactional mechanisms, including inner *physiological processes and gene expression*, which in turn may be influenced by a further set of environmental factors.The *bodily environment* is considered in both its normal and pathological functioning (e.g. 40)).

A theme present in this cluster is the study of how the expression of particular genes

increases the likelihood of obesity (e.g. (41)). The appearance of the terms "obese women" and "maternal obesity" in this cluster without any male, paternal or parental counterparts points to a specific interest in the inner bodily environments of women and possible intra-uterine effects on health (for an article from the sample disussing effects of heredity, intra-uterine conditions and postnatal envrionments see (42)). Although it might seem as if this cluster shares an interest in long-term effects of nutrition on obesity with the food environment cluster, this similarity masks a vast difference in approach. While studies of food environment focus on large-scale food availability and population BMI, the studies in this cluster invariably address detailed processes in the inner bodily environment. Thus the kinds of environment-gene interaction studied here point towards a configuration of environment less focused on how the environment impacts calorie input and output and more on how environmental factors might influence the expression of genes or the regulation of inner bodily mechanisms. In this sense, articles typical of this cluster draw on a notion of environment which is significantly different from the other clusters.

When nutrition is of concern in this cluster, the focus is often on the risk of chronic disease. This focus on risky diets is indicated by terms such as "fatty acids", and "high-fat diets". Similarly, attention is paid to inner bodily mechanisms like "lipid metabolism" and "glucose intolerance." Chronic conditions often or normally associated with obesity appear prominently in the bodily environment cluster as indicated by terms such as "cardiovascular disease", "coronary heart disease", "diabetes", and "metabolic syndrome".

Discussion

The mixed methods design used in this study identifies five clear discursive regions (or notions of environment) within the field of obesity research. These are the institutional, the built, the food, the

family and the bodily environment. Each of these entails a different object of research and a different set of mechanisms of interaction between object and environment. This observation raises a broader set of questions about the configuration of the field of obesity research. In what follows, we consider three possible interpretations of the network pattern identified here. These are as: a pattern of simultaneous integration and disintegration; a partially coherent hierarchy; and/or a pattern of selective simplification and complexification.

Interpretation one: A pattern of simultaneous integration and disintegration

The first of these possible interpretations fastens attention to some of the physical properties of the map (Figure 2). While the five clusters are the most important features of the map, and the clusters represent a large number of terms which relate closely to each other, some terms are related to more than one cluster. Where several terms are shared between two clusters, the individual clusters appear less tightly knit and the two clusters are drawn more closely together. If, on the other hand, a cluster is composed almost exclusively of its own terms, that cluster will appear more tightly knit and at a distance from the other clusters.

The tension between strict separation and. rapprochement between clusters of research can be related to overall visions or normative ideas about how the field should do its work. The rise of ecological models of obesity (2) as well as broad-scale systemically oriented policy efforts such as the UK Foresight Report (4) are both indicative of ambitions to make the field as coherent and coordinated as possible (8). In this view, more shared terms between the clusters read as a (positive) sign of greater integration, while tightly knit clusters might well be seen as reflecting more isolation. Our results show evidence of both integration and isolation. For example, at the bottom of Figure 2, the bodily environment cluster is relatively tightly knit and disconnected from the others.

In contrast, at the top of the map, the four other clusters (institutional, food, built and family environments) are more interconnected and less tightly knit.

Interpretation two: A partially coherent hierarchy

Although all of the clusters define different objects of research, we could also attempt to look for more systematic connections between them. For example, the sizes of these objects of research might be fitted into a micro-to-macro series of levels ranging from matters that are physically small, such as genes or adipose cells within an organism, to matters of a much larger magnitude, such as a nationwide system for the provision of school lunches. Pursuing this idea of levels, these environments might be arranged by size, with, for example, level 1 consisting of minute processes within the individual organism (bodily environment); level 2 being the family environment; and level 3 being the food environments and the built environments that encompass entire neighbourhoods. A level 4 might be institutional environments, which often operate on a nationwide level, and contain all of the previously mentioned objects.

While this idea might work to some extent, the levels as represented by the clusters identified in this analysis are not discrete. For instance, a food environment is not perfectly contained within a policy environment, as many things other than policy influence the food environment (e.g. weather patterns, climate change, food retail and marketing strategies, and cooking fashions). Similarly, the bodily environment is not perfectly contained within the family environment, as the bodies of children and adolescents are subject to many other influences beyond their familial patterns of energy intake and expenditure. In short, the five clusters do not add up to a single well-defined and well-described system. The clusters do not comply with the presumption of the ANGELO grid that obesogenic environments can be dissected into four types and two levels, leaving no residuals. Instead, the five clusters overlap, interpenetrate and leave gaps. To depict the

field of obesity research as a kind of levelled hierarchy would therefore require multiple caveats. At best, the field might be depicted as a somewhat fragmented and partially coherent hierarchy. Given such lack of unity, the field of obesity research resembles a broader pattern of 'disunity', which has been described in several other fields (43, 44). One particularly well-described example is post-Cold War physics where subfields have been shown to engage in a complex pattern of interdisciplinary, mobile and market-driven collaborations with a broad range of other sciences (45). In this way, modern physics has moved beyond its earlier quest for positioning particle physics as the inevitable building block of all things and all sciences (45). In a similar way, the field of obesity research seems to have a 'disunited' character with its many simultaneous engagements rather than a single starting point from which everything else can be derived.

Interpretation three: A pattern of selective simplification and complexification

Rather than forcing the idea of a hierarchy based on the physical size of the obesity-objects, a third possibility would be to view the five clusters on our map as a pattern of simultaneous simplification and complexification. Any research project begins with a choice of focus, and by implication, a choice of building on a number of pragmatically simplified assumptions (46). In the present context, a study focusing on the obesogenic effect of institutional environments on thousands of school children might, for instance, build on the operational assumptions that obesity can be measured by BMI and that the food environment can be measured in terms of the prevalence of potentially obesity-encouraging objects such as vending machines. Other studies might draw on entirely different operational assumptions. For instance, a study of the obesogenic effects of an adverse prenatal environment might assume that these basic biological mechanisms can be identified by experimentally manipulating the food consumption of pregnant rats and their offspring, and by measuring their blood pressure and a range of metabolic parameters (47). The

chosen operational assumptions that end up being taken for granted (and thus simplified) are not self-evident by any inherent quality but rather appear so because certain methods, metrics or concepts have been preferred or agreed upon amongst a group of researchers, creating a path dependency effect. This applies to all research, including this study.

On this interpretation, what Figure 2 shows is not a series of objects of research that more or less fit together; rather, it shows how the deployment of particular simplifications, assumptions, or standards has facilitated the development of complex understandings of particular obesity-related phenomena. In other words, what appears on the map is a consequence of the tools available for simplification. For example, researchers can learn more about the institutional environment because they can count the number of physical education lessons and soft drink vending machines in schools. They could alternatively learn more about the bodily environment because they can set up experiments with rodent models. They could also learn more about the food environment because they can relate BMI statistically with the average distance to the nearest fast food restaurants, and so on. Every step along the way, and regardless of the type of research object in question, a more complex understanding of obesity is made possible by the availability and deployment of particular kinds of simplification. The development and dynamism of the field is therefore not only a question of the findings made by obesity researchers, but also a question of how they continually invent new standards, devices and measurements that allow them to define new study objects. The five notions of environment in Figure 2 can therefore be seen as an outcome of currently available productive simplifications.

Conclusion

Like other contemporary scientific fields, obesity research is characterised both by visions of unity and by practices of disunity. The mixed methods design employed here gives a systematic empirical analysis of the status and configuration of the field, as based on highly-cited scientific literature on

obesity and environment. While any such analysis is subject to bias especially according to the sampling frame used to obtain the articles used, we have identified five distinct notions of environment (institutional, built, food, family and bodily environments) in a broadly sampled dataset of 414 highly-cited articles. We have also shown that these multiple notions of environments invite deeper inquiry into the status and the configuration of the interdisciplinary field of obesity research. The field can be interpreted variously as: being simultaneously integrating and disintegrating; a partially coherent hierarchy; and/or a pattern of simplification and complexification. This study involved an analysis of 15 years of scientific publication in this field cross-sectionally; future analyses incorporating larger datasets and a longitudinal comparison should give further information on the merit of each of these three interpretations. The database for analysis might also be expanded with government reports and other types of policy documents to explore the degree to which the same or different notions of environment inform policy and administrative discourses. Finally, we propose that a time lapse version of this map be generated, which would allow us to see how the field is changing, and aid the understanding of both how the field is configured and how its practice might be strategically altered to focus research where it might be most needed.

References

1. Ulijaszek SJ. *Models of Obesity. From Ecology to Complexity in Science and Policy*. Cambridge: Cambridge University Press, 2017.
2. Swinburn BA, Egger G, Raza F. Dissecting obesogenic environments: The development and application of a framework for identifying and prioritizing environmental interventions for obesity. *J Prev Med* 1999; **29**: 563–70.

3. Popkin, B.M. (2004). The nutrition transition: an overview of world patterns of change. *Nutrition Reviews* 62: S140-3.
4. Office of Science and Technology, Her Majesty's Government. *Foresight. Tackling Obesities: Future Choices. Modelling Future Trends in Obesity and their Impact on Health*. London, 2007.
5. Government Office for Science. *Foresight. Tackling Obesities: Future Choices. Obesity System Atlas*. London, 2007.
6. World Health Organization. *Report of the Commission on Ending Childhood Obesity*. Geneva: World Health Organization, 2016.
7. Lee RE, McAlexander KM, Banda JA. *Reversing the obesogenic environment*. Champaign Illinois: Human Kinetics, 2011.
8. Ulijaszek, S.J. (2015). With the benefit of Foresight: obesity, complexity and joined-up government. BioSocieties 10: 213-28.
9. Lake A, Townsend T, Alvanides S (2011). Obesogenic Environments: Complexities, Perceptions and Objective Measures. Wiley-Blackwell.
10. Kirk SFL, Penney TL, McHugh TLF. Characterizing the obesogenic environment: the state of the evidence with directions for future research. *Obesity Reviews* 2010; **11**(2): 109-117.
11. Rabin BA., Boehmer TK, Brownson RC. Cross-national comparison of environmental and policy correlates of obesity in Europe. *European Journal of Public Health* 2007; **17**: 53-61.
12. Story M, Kaphingst KM, Robinson-O'Brien R, et al. Creating healthy food and eating environments: policy and environmental approaches. *Annual Review of Public Health* 2008; **29**: 253-72.

13. Dietz WH, Benken DE, Hunter AS. Public health law and the prevention and control of obesity. *The Millbank Quarterly* 2009; **87**: 215-27.

14. Swinburn BA, Sacks G., Hall, KD. et al. The global obesity pandemic: shaped by global drivers and local environments. *Lancet* 2011; **378**: 804-14.

15. Allender S, Gleeson E, Crammond B, et al. Policy change to create supportive environments for physical activity and healthy eating: which options are the most realistic for local government? *Health Promotion International* 2012; **27**: 261-74.

16. Mohebati L, Lobstein T, Millstone E, et al. Policy options for responding to the growing challenge from obesity in the United Kingdom. *European Journal of Public Health* 2007; **8**: 109-15.

17. Shill J, Mavoa H, Allender S, et al. Government regulation to promote healthy food environments – a view from inside state governments. *Obesity Reviews* 2012; **13**: 162-173.

18. Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.

19. Mongeon, P., & Paul-Hus, A. (2016). The journal coverage of Web of Science and Scopus: a comparative analysis. *Scientometrics*, *106*(1), 213-228.

20. Marres, N. (2015). Why map issues? On controversy analysis as a digital method. *Science, Technology, & Human Values*, *40*(5), 655-686.

21. Harzing AW, Alakangas S. Google Scholar, Scopus and the Web of Science: A longitudinal and cross-disciplinary comparison. *J Scientometrics* 2016; **106**(2): 787–804.

22. Vieira E, Gomes J. A comparison of Scopus and Web of Science for a typical university. *J Scientometrics* 2009; **81**(2): 587–600.

23. Chadegani AA, Salehi H, Yunus MM, et al. A comparison between two main academic literature collections: Web of Science and Scopus databases. *Asian Social Science* 2013; **9**(5): 18-26.

24. CorTexT. https://www.cortext.net (accessed 10 January 2018).

25. Van Eck NJ, Waltman L. Text mining and visualization using VOSviewer. *Arxiv preprint arXiv*: 1109.2058. 2011.

26. Jacomy, M., Venturini, T., Heymann, S., & Bastian, M. (2014). ForceAtlas2, a continuous graph layout algorithm for handy network visualization designed for the Gephi software. *PloS one*, *9*(6), e98679.

27. Blondel VD, Guillaume JL, Lambiotte R, et al. Fast unfolding of communities in large networks. *J Stat Mech: Theory and Exp* 2008; **10**: P10008.

28. Turner L, Chaloupka FJ. Slow progress in changing the school food environment: Nationally representative results from public and private elementary schools. *J Acad Nutr Diet* 2012 Sep 30; **112**(9): 1380–9.

29. Feng J, Glass TA, Curriero FC, Stewart WF, Schwartz BS. The built environment and obesity: A systematic review of the epidemiologic evidence. Health & Place 2010; 16: 175–190

30. Gina S. Lovasi, Judith S. Jacobson, James W. Quinn, Kathryn M. Neckerman, Maxine N. Ashby-Thompson, and Andrew Rundle. Is the Environment Near Home and School Associated with Physical Activity and Adiposity of Urban Preschool Children? Journal of Urban Health, Bulletin of the New York Academy of Medicine 2011; 88/6: 1143-1157.

31. Franklin BA. The downside of our technological revolution? An obesity-conducive environment. *Am J Cardiol* 2001 May 1; **87**(9): 1093–5.

32. Sigmundová D, Ansari WE, Sigmund E. Neighbourhood Environment Correlates of Physical Activity: A Study of Eight Czech Regional Towns. *Int J Environ Res Public Health* 2011; **8**(2): 341-357.

33. Saelens BE, Sallis JF, Frank LD, et al. Neighborhood Environment and Psychosocial Correlates of Adults' Physical Activity. *Med Sci Sports Exerc* 2012; **44**(4): 637-646.

34. Stark JH, Neckerman K, Lovasi GS, et al. Neighbourhood food environments and body mass index among New York City adults. *J Epidemiol Community Health* 2013 Sep 1; **67**(9): 736–42.

35. Wang MC, Cubbin C, Ahn D, et al. Changes in neighbourhood food store environment, food behaviour and body mass index, 1981–1990. *J Public Health Nutr* 2008 Sep; **11**(9): 963–70.

36. Farley TA, Rice J, Bodor JN, et al. Measuring the food environment: Shelf space of fruits, vegetables, and snack foods in stores. *J Urban Health* 2009 Sep 1; **86**(5): 672–82.

37. Bridle-Fitzpatrick S. Food deserts or food swamps? A mixed-methods study of local food environments in a Mexican city. *J Soc Sci Med* 2015 Oct 31; **142**: 202–13.

38. Zachary DA, Palmer AM, Beckham SW, et al. A framework for understanding grocery purchasing in a low-income urban environment. *J Qual Health Res* 2013 May; **23**(5): 665–78.

39. Salsberry PJ, Reagan PB. Effects of heritability, shared environment, and nonshared intrauterine conditions on child and adolescent BMI. *J Obes* 2010 Sep 1; **18**(9): 1775–80.

40. Schmidt I. Metabolic diseases: The environment determines the odds, even for genes. *J Physiol* 2002 Jun 1; **17**(3): 115–21.

41. Koch LG, Britton SL. Development of Animal Models to Test the Fundamental Basis of Gene-Environment Interactions. Obesity (Silver Spring, Md). 2008;16:suppl 3, 28-32.

42. Salsberry PJ, Reagan PB. Effects of Heritability, shared Environment, and Nonshared Intrauterine Conditions on Child and Adolescent BMI. Obesity 2010; 18:9, 1775-1780

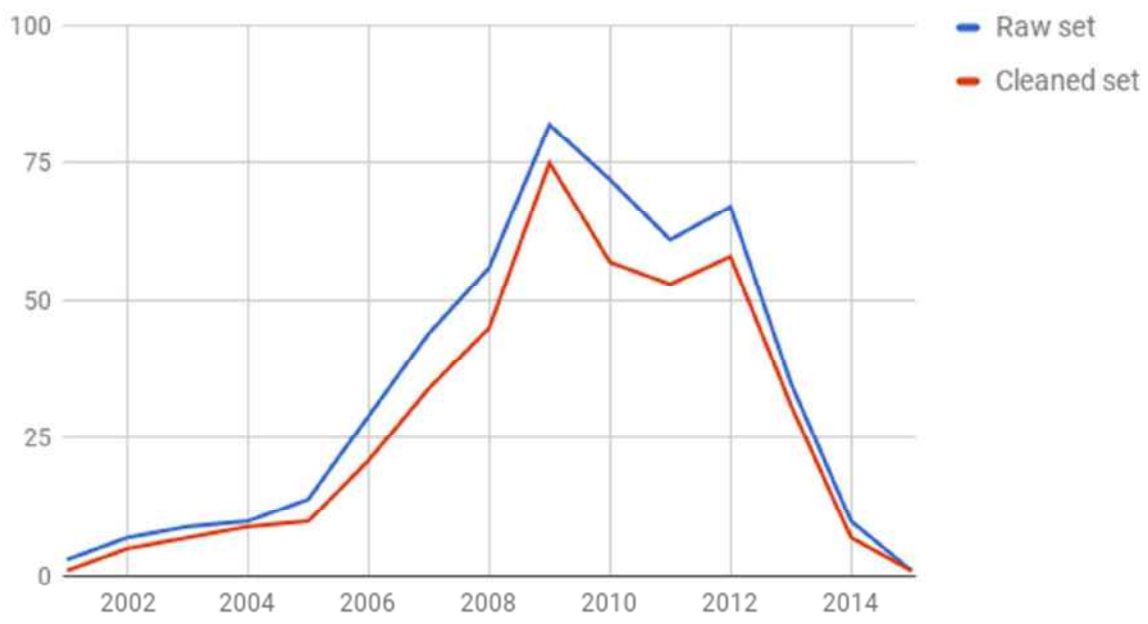
43. Kamminga H, Somsen G (eds). *Pursuing the unity of science: Ideology and scientific practice from the Great War to the Cold War*. Routledge, 2016.

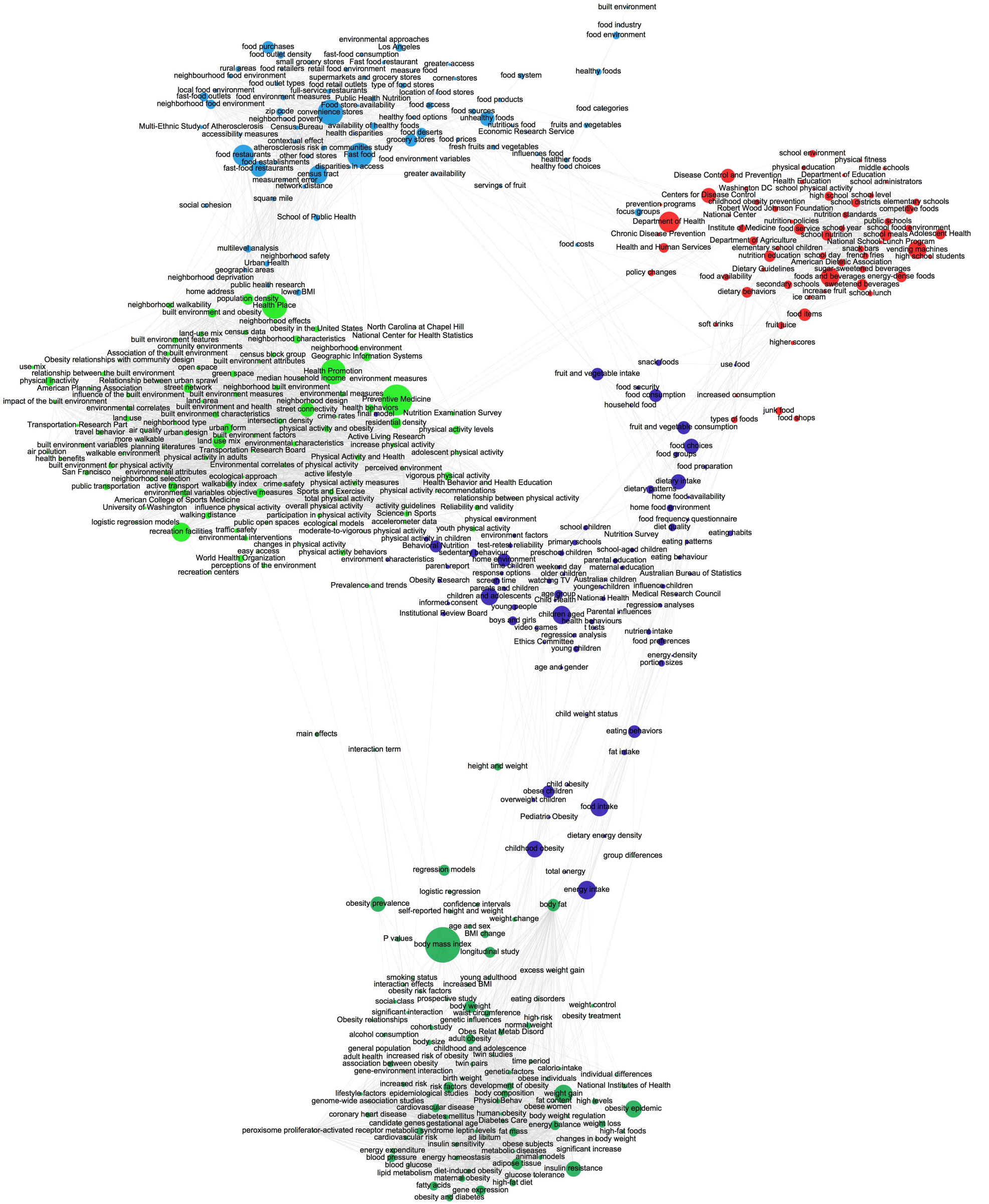
44. Galison PL, Stump DJ. *The disunity of science: Boundaries, contexts, and power*. Stanford University Press, 1996.

45. Galison PL. Meaning of scientific unity: The law, the orchestra, the pyramid, the quilt and the ring. In: Kamminga H, Somsen G (eds) *Pursuing the unity of science: Ideology and scientific practice from the Great War to the Cold War*. Routledge, 2016.

46. Elgaard Jensen T, Petersen MK. Straddling, Betting and Passing: The configuration of user involvement in cross-sectorial innovation projects. In: Hyysalo S, Elgaard Jensen T, Oudshoorn N (eds.) *New production of users.* Routledge, 2016, pp. 136–159.

47. Vickers MH, Ikenasio BA and Breier BH. Adult growth hormone treatment reduces hypertension and obesity induced by an adverse prenatal environment. *J Endocrinol* 2002 Dec 1; **175**(3): 615–623.


100
75
50
25
0
2002
2004
2006
2008
2010
2012
2014
Raw set
Cleaned set


built environment
food industry
food environment
environmental approaches
food purchases
Los Angeles
food outlet density
fast-food consumption
small grocery stores
Fast food restaurant
greater access
rural areas
food retailers
retail food environment
measure food
healthy foods
neighbourhood food environment
supermarkets and grocery stores
corner stores
food system
food outlet types
food retail outlets
type of food stores
local food environment
full-service restaurants
location of food stores
fast-food outlets
food environment measures
Public Health Nutrition
food products
neighborhood food environment
Food store availability
food access
food categories
zip code
convenience stores
food sources
neighborhood poverty
healthy food options
unhealthy foods
Multi-Ethnic Study of Atherosclerosis
Census Bureau
availability of healthy foods
nutritious food
fruits and vegetables
accessibility measures
health disparities
food deserts
Economic Research Service
contextual effect
grocery stores
food prices
atherosclerosis risk in communities study
fresh fruits and vegetables
food restaurants
other food stores
Fast food
influences food
food establishments
food environment variables
healthier foods
disparities in access
healthy food choices
fast-food restaurants
census tract
greater availability
measurement error
network distance
servings of fruit
square mile
social cohesion
School of Public Health
school environment
physical fitness
physical education
middle schools
Disease Control and Prevention
Department of Education
Health Education
school administrators
Washington DC
school physical activity
Centers for Disease Control
high school
school level
childhood obesity prevention
school districts
elementary schools
prevention programs
Robert Wood Johnson Foundation
competitive foods
focus groups
National Center
nutrition standards
Department of Health
nutrition policies
public schools
Institute of Medicine
food service
school year
school food environment
Chronic Disease Prevention
school nutrition
school meals
Adolescent Health
Department of Agriculture
National School Lunch Program
food costs
Health and Human Services
elementary school children
snack bars
vending machines
nutrition education
school day
french fries
high school students
American Dietetic Association
Dietary Guidelines
sugar-sweetened beverages
policy changes
food availability
foods and beverages
energy-dense foods
secondary schools
sweetened beverages
dietary behaviors
increase fruit
school lunch
ice cream
multilevel analysis
neighborhood safety
Urban Health
geographic areas
neighborhood deprivation
public health research
home address
lower BMI
population density
neighborhood walkability
Health Place
built environment and obesity
neighborhood effects
food items
soft drinks
fruit juice
obesity in the United States
North Carolina at Chapel Hill
land-use mix
census data
National Center for Health Statistics
built environment features
neighborhood characteristics
higher scores
community environments
neighborhood environment
Association of the built environment
census block group
Geographic Information Systems
Obesity relationships with community design
built environment attributes
snack foods
use mix
open space
Health Promotion
use food
relationship between the built environment
green space
fruit and vegetable intake
physical inactivity
Relationship between urban sprawl
median household income
environment measures
food security
American Planning Association
street network
neighborhood built environment
food consumption
increased consumption
influence of the built environment
built environment measures
environmental measures
Preventive Medicine
household food
impact of the built environment
land area
neighborhood design
junk food
environmental correlates
built environment and health
street connectivity
health behaviors
food shops
built environment characteristics
crime rates
final model
Nutrition Examination Survey
types of foods
land use
intersection density
Transportation Research Part
neighborhood type
residential density
fruit and vegetable consumption
travel behavior
air quality
urban design
urban form
physical activity and obesity
physical activity levels
built environment factors
Active Living Research
more walkable
land use mix
environmental characteristics
increase physical activity
food choices
built environment variables
planning literatures
Transportation Research Board
food groups
air pollution
walkable environment
adolescent physical activity
health benefits
physical activity in adults
Physical Activity and Health
built environment for physical activity
Environmental correlates of physical activity
food preparation
San Francisco
environmental attributes
perceived environment
ecological approach
active lifestyle
vigorous physical activity
dietary intake
neighborhood selection
public transportation
active transport
walkability index
crime safety
physical activity measures
Health Behavior and Health Education
dietary patterns
environmental variables objective measures
Sports and Exercise
physical activity recommendations
home food availability
American College of Sports Medicine
total physical activity
relationship between physical activity
University of Washington
influence physical activity
overall physical activity
activity guidelines
Reliability and validity
home food environment
walking distance
participation in physical activity
Science in Sports
food frequency questionnaire
logistic regression models
public open spaces
ecological models
accelerometer data
physical environment
diet quality
recreation facilities
traffic safety
moderate-to-vigorous physical activity
youth physical activity
school children
Nutrition Survey
eating habits
environmental interventions
environment factors
physical activity in children
primary schools
eating patterns
changes in physical activity
Behavioral Nutrition
test-retest reliability
school-aged children
easy access
physical activity behaviors
sedentary behaviour
preschool children
eating behaviour
World Health Organization
environment characteristics
home environment
parental education
perceptions of the environment
parent report
time children
weekend day
maternal education
recreation centers
response options
older children
Australian Bureau of Statistics
Obesity Research
screen time
watching TV
Australian children
Prevalence and trends
parents and children
younger children
influence children
children and adolescents
age group
Medical Research Council
informed consent
Child Health
National Health
regression analyses
young people
Institutional Review Board
children aged
Parental influences
boys and girls
health behaviours
video games
t tests
nutrient intake
regression analysis
Ethics Committee
food preferences
young children
energy density
portion sizes
age and gender
child weight status
main effects
eating behaviors
interaction term
fat intake
height and weight
child obesity
obese children
overweight children
food intake
Pediatric Obesity
dietary energy density
childhood obesity
group differences
regression models
total energy
energy intake
logistic regression
obesity prevalence
confidence intervals
body fat
self-reported height and weight
weight change
age and sex
BMI change
P values
body mass index
longitudinal study
excess weight gain
smoking status
young adulthood
interaction effects
increased BMI
obesity risk factors
social class
prospective study
eating disorders
body weight
weight control
significant interaction
waist circumference
obesity treatment
Obesity relationships
genetic influences
high risk
cohort study
normal weight
alcohol consumption
Obes Relat Metab Disord
body size
adult obesity
general population
childhood and adolescence
adult health
increased risk of obesity
twin studies
association between obesity
twin pairs
time period
gene-environment interaction
genetic factors
caloric intake
birth weight
obese individuals
individual differences
increased risk
risk factors
development of obesity
National Institutes of Health
lifestyle factors
epidemiological studies
body composition
weight gain
genome-wide association studies
Physiol Behav
fat content
high levels
cardiovascular disease
obese women
obesity epidemic
coronary heart disease
diabetes mellitus
human obesity
body weight regulation
candidate genes
gestational age
Diabetes Care
energy balance
weight loss
peroxisome proliferator-activated receptor
metabolic syndrome
leptin levels
fat mass
high-fat foods
cardiovascular risk
ad libitum
changes in body weight
insulin sensitivity
obese subjects
energy expenditure
metabolic diseases
significant increase
blood pressure
energy homeostasis
animal models
blood glucose
adipose tissue
insulin resistance
lipid metabolism
diet-induced obesity
glucose tolerance
maternal obesity
fatty acids
high-fat diet
gene expression
obesity and diabetes

Environment (a)	Obesity object (b)	Interactive mechanism (c)	Colour of cluster on figure 2.
Institutional environment	Institutional food services	Policies and their implementation	Red
Built environment	Population obesity	Energy expenditure	Light green
Food environment	Population obesity	Energy intake	Light blue
Family environment	Population obesity in children and adolescents.	Energy expenditure and intake	Purple
Bodily environment	Fat deposition in human or rodent organisms	Physiological processes, gene-environment interaction	Dark green

Supporting information for

Identifying Notions of Environment in Obesity Research Using a Mixed Methods Approach

Table of contents

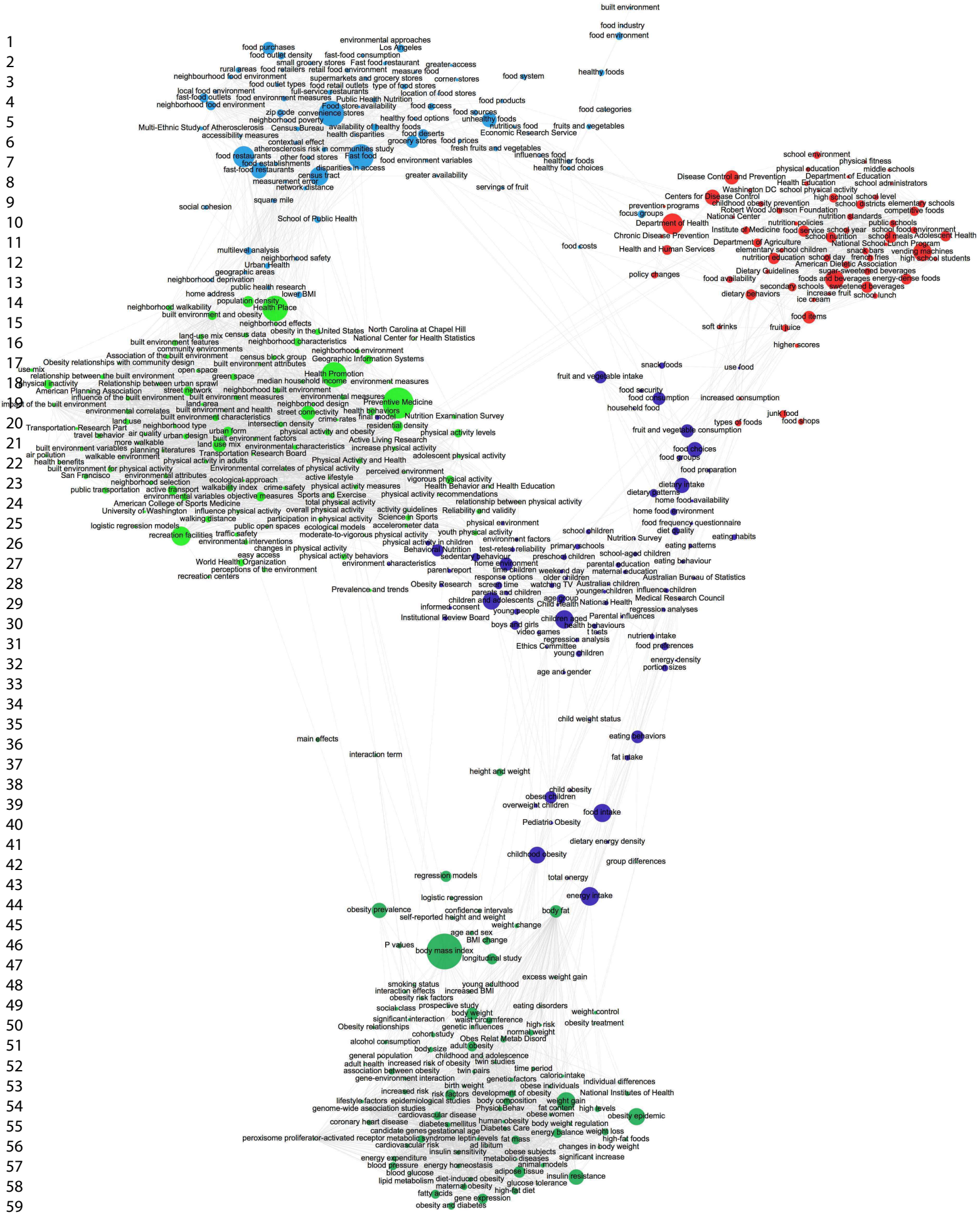


Figure 2: Network map of the discursive patterns in 414 articles related to environment and obesity research. Nodes represent noun phrases, edges represent co-occurrence of noun phrases in the same papers. The size of the nodes represent the frequency with which the noun phrase occurs in the dataset. The colour of the nodes represent the cluster assigned to the node through Louvain modularity. Closeups of each cluster are available on the following pages.

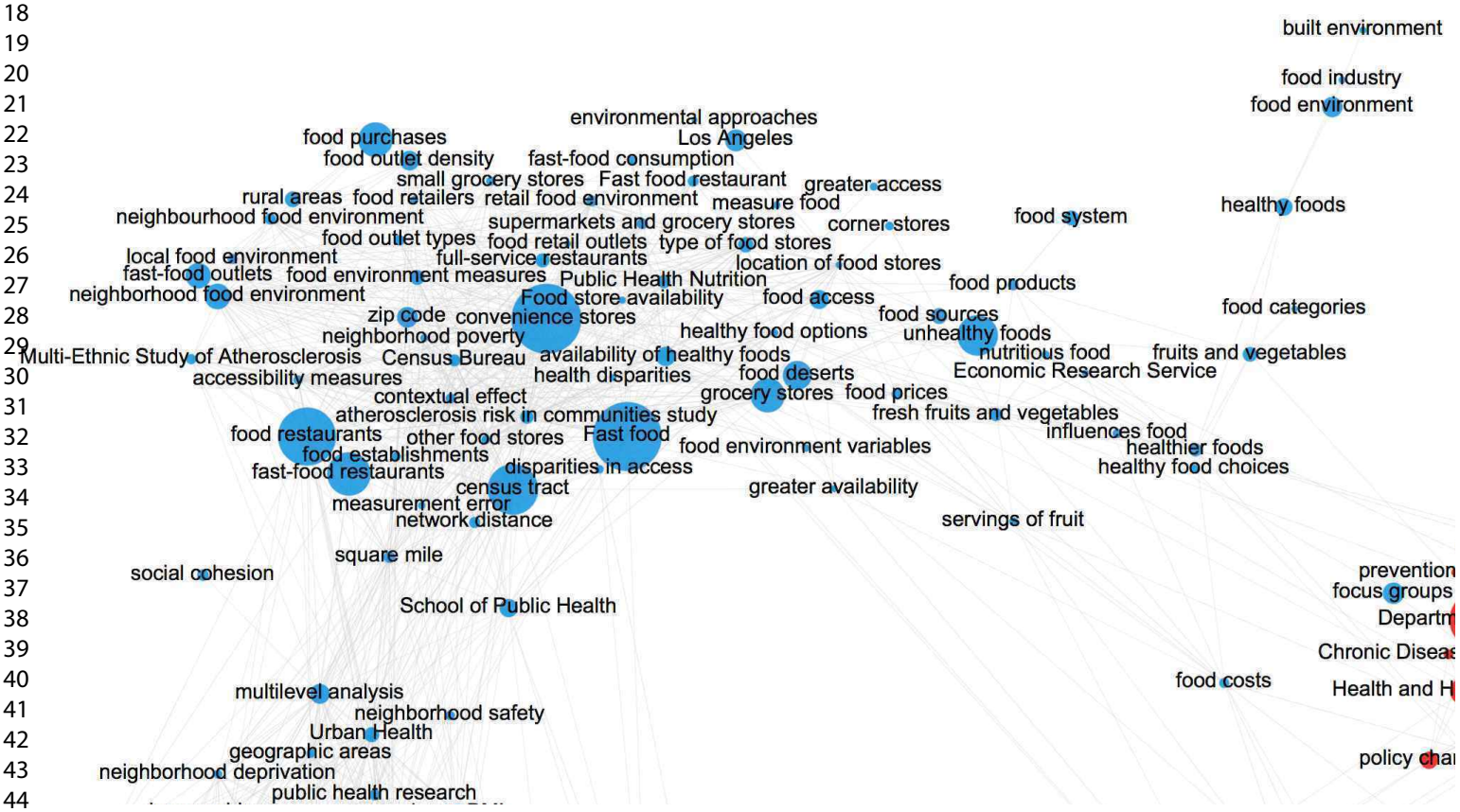


Figure 2: Closeup of the light blue cluster on the food environment. Nodes represent noun phrases, edges represent co-occurrence of noun phrases in the same papers. The size of the nodes represent the frequency with which the noun phrase occurs in the dataset. The colour of the nodes represent the cluster assigned to the node through Louvain modularity. Close-ups of each cluster are available on the following pages.

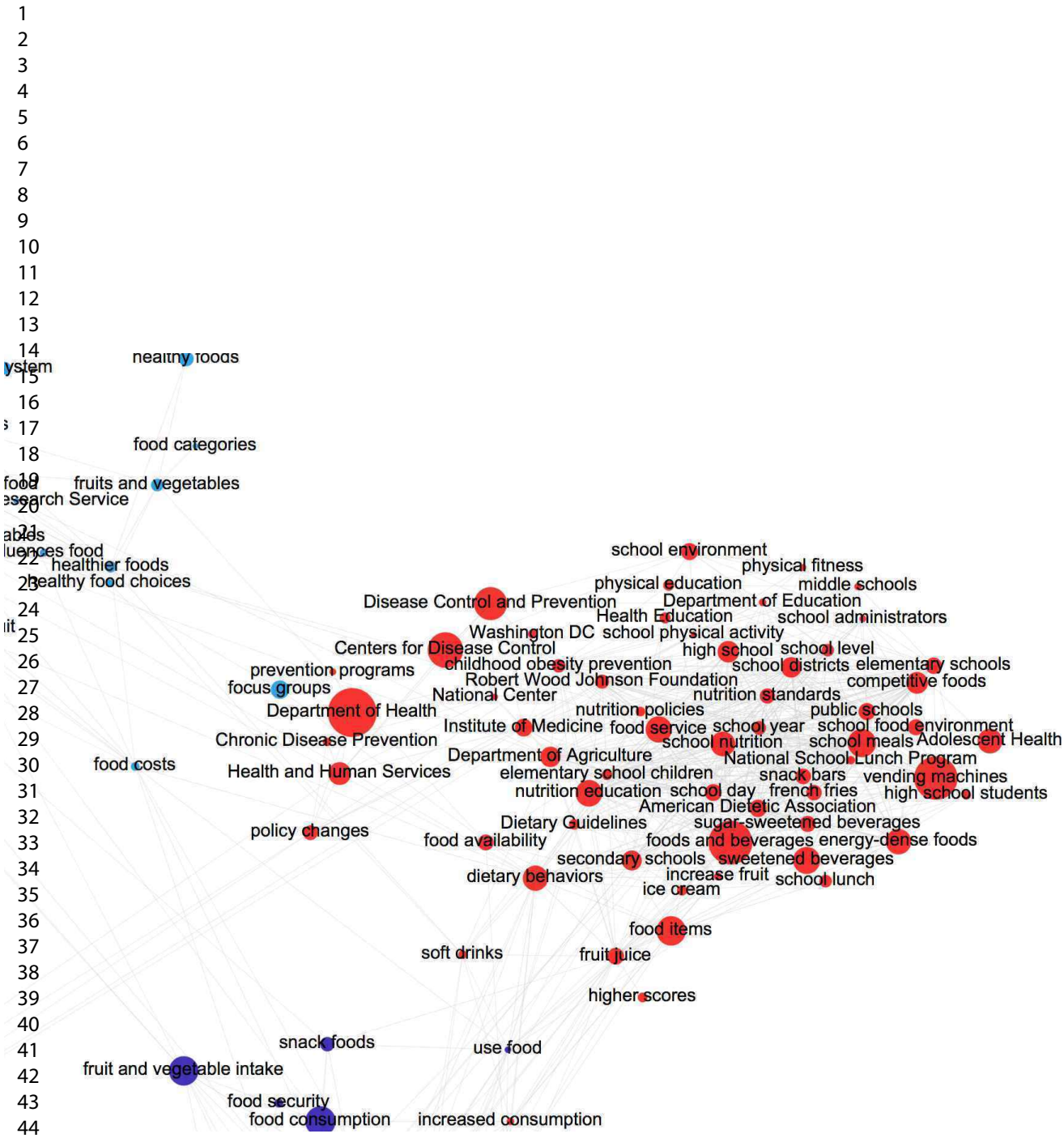


Figure 2: Closeup of the red cluster on the institutional environment. Nodes represent noun phrases, edges represent co-occurrence of noun phrases in the same papers. The size of the nodes represent the frequency with which the noun phrase occurs in the dataset. The colour of the nodes represent the cluster assigned to the node through Louvain modularity. Close-ups of each cluster are available on the following pages.

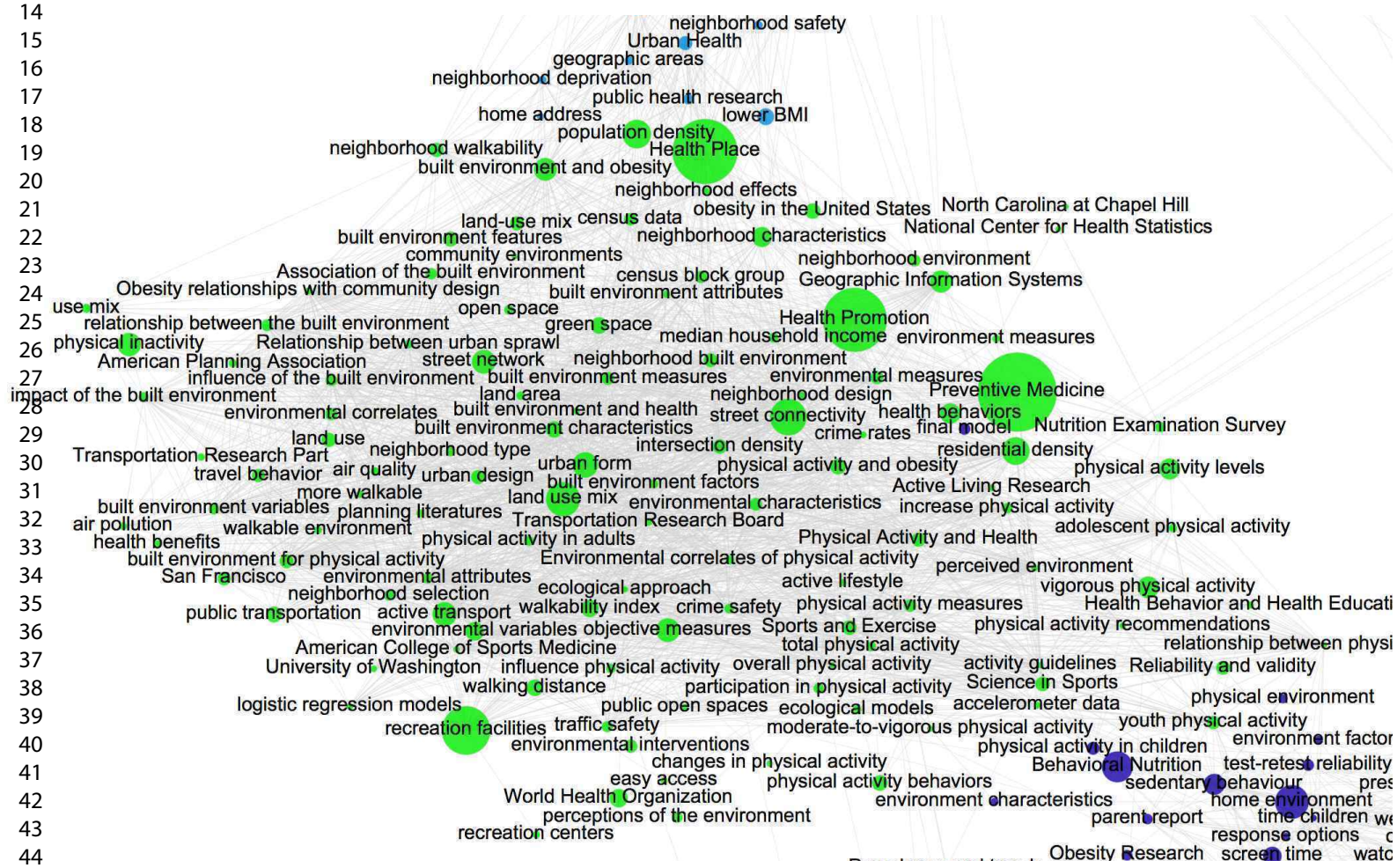


Figure 2: Closeup of the light green cluster on the built environment. Nodes represent noun phrases, edges represent co-occurrence of noun phrases in the same papers. The size of the nodes represent the frequency with which the noun phrase occurs in the dataset. The colour of the nodes represent the cluster assigned to the node through Louvain modularity. Close-ups of each cluster are available on the following pages.

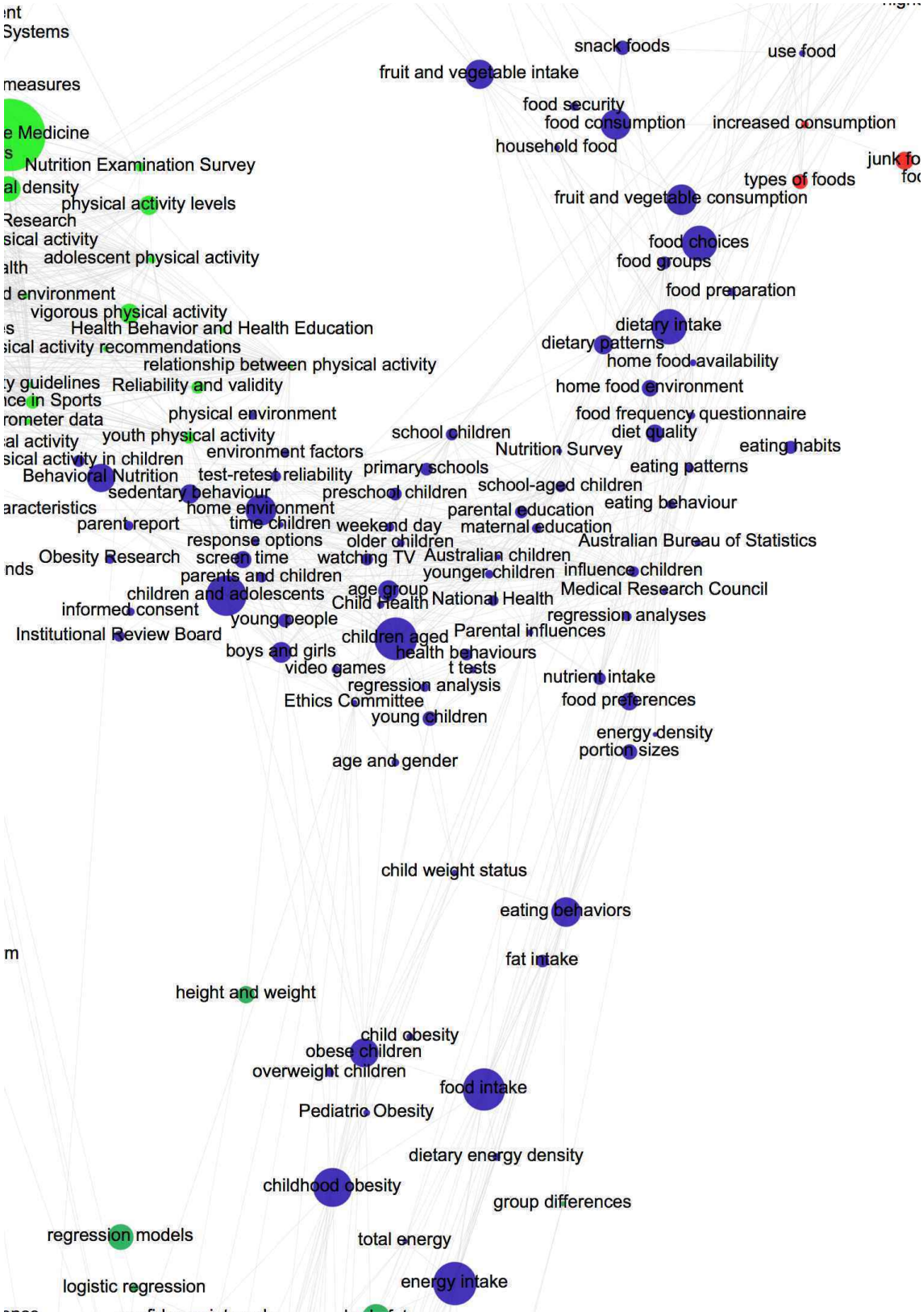


Figure 2: Closeup of the purple cluster on the family environment. Nodes represent noun phrases, edges represent co-occurrence of noun phrases in the same papers. The size of the nodes represent the frequency with which the noun phrase occurs in the dataset. The colour of the nodes represent the cluster assigned to the node through Louvain modularity. Close-ups of each cluster are available on the following pages.

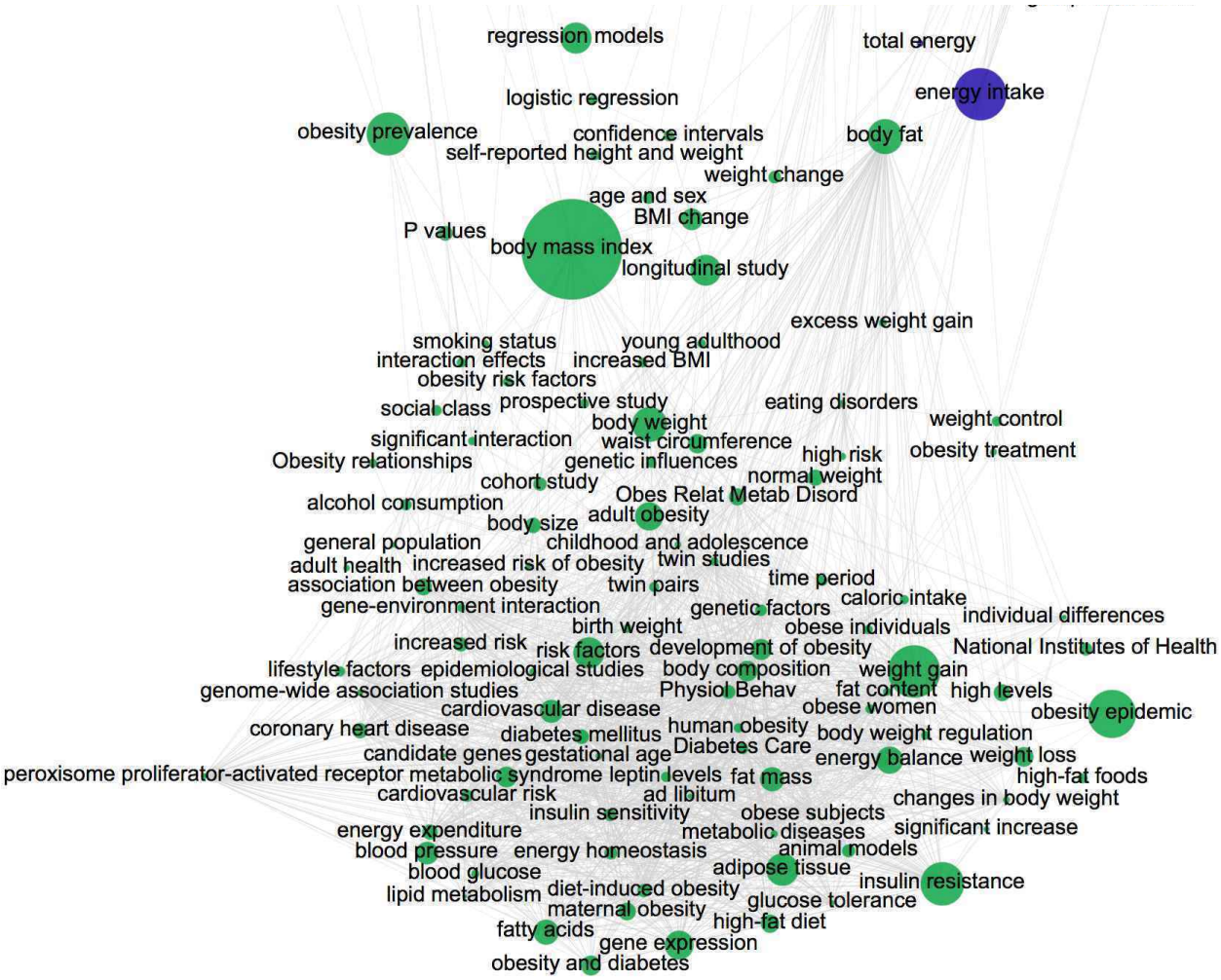


Figure 2: Closeup of the dark green cluster on the bodily environment. Nodes represent noun phrases, edges represent co-occurrence of noun phrases in the same papers. The size of the nodes represent the frequency with which the noun phrase occurs in the dataset. The colour of the nodes represent the cluster assigned to the node through Louvain modularity. Close-ups of each cluster are available on the following pages.

Full reference list of the 414 articles in the sample

1. Adamo KB, Sheel AW, Onywera V, et al. Child obesity and fitness levels among Kenyan and Canadian children from urban and rural environments: A KIDS-CAN Research Alliance Study. *International Journal of Pediatric Obesity* 2011; **6**(2): e225-e232.
2. Adams AK, Harvey H, Brown D. Constructs of Health and Environment Inform Child Obesity Prevention in American Indian Communities. *Obesity* 2008; **16**(2): 311-317.
3. Adams MA, Sallis JF, Kerr J, et al. Neighborhood environment profiles related to physical activity and weight status: A latent profile analysis. *Prev Med* 2011; **52**(5): 326-331.
4. Ahern M, Brown C, Dukas S. A National Study of the Association Between Food Environments and County-Level Health Outcomes. *The Journal of Rural Health* 2011; **27**(4): 367-379.
5. Alam C, Bittoun E, Bhagwat D, et al. Effects of a germ-free environment on gut immune regulation and diabetes progression in non-obese diabetic (NOD) mice. *Diabetologia* 2011; **54**(6): 1398-1406.
6. Allender S, Gleeson E, Crammond B, et al. Policy change to create supportive environments for physical activity and healthy eating: which options are the most realistic for local government? *Health Promotion International* 2012; **27**: 261-74.
7. Alton D, Adab P, Roberts L, et al. Relationship between walking levels and perceptions of the local neighbourhood environment. *Arch Dis Child* 2007; **92**(1): 29-33.
8. Amis AM, Wright PM, Dyson B, et al. Implementing Childhood Obesity Policy in a New Educational Environment: The Cases of Mississippi and Tennessee. *Am J Public Health* 2012; **102**(7): 1406-1413.
9. An R, Sturm R. School and Residential Neighborhood Food Environment and Diet Among California Youth. *Am J Prev Med* 2012; **42**(2): 129-135.
10. Anastasovska J, Arora T, Sanchez Canon GJ, et al. Fermentable Carbohydrate Alters Hypothalamic Neuronal Activity and Protects Against the Obesogenic Environment. *Obesity* 2012; **20**(5): 1016-1023.
11. Ashe M, Feldstein LM, Graff S, et al. Local Venues for Change: Legal Strategies for Healthy Environments. *The Journal of Law, Medicine & Ethics* 2007; **35**(1): 138-147.
12. Awad O, Jiao C, Ma N, et al. Obese Diabetic Mouse Environment Differentially Affects Primitive and Monocytic Endothelial Cell Progenitors. *Stem Cells* 2005; **23**(4): 575-583.
13. Bader MDM, Purciel M, Yousefzadeh P, et al. Disparities in Neighborhood Food Environments: Implications of Measurement Strategies. *Economic Geography* 2010; **86**(4): 409-430.
14. Beets MW, Huberty J, Beighle A, et al. Impact of Policy Environment Characteristics on Physical Activity and Sedentary Behaviors of Children Attending Afterschool Programs. *Health Educ Behav* 2013; **40**(3): 296-304.

15. Belansky ES, Cutforth N, Delong E, et al. Early Effects of the Federally Mandated Local Wellness Policy on School Nutrition Environments Appear Modest in Colorado's Rural, Low-Income Elementary Schools. *J Am Diet Assoc* 2010; **110**(11): 1712-1717.
16. Beltaïfa L, Traissac P, El Ati J, et al. Prevalence of obesity and associated socioeconomic factors among Tunisian women from different living environments. *Obesity* 2009; **10**(2): 145-143.
17. Benedetti MG, Di Gioia A, Conti L, et al. Physical activity monitoring in obese people in the real life environment. *Journal of NeuroEngineering and Rehabilitation* 2009; **6**:47
18. Bentley R, Jolley D, Kavanagh AM. Local environments as determinants of walking in Melbourne, Australia. *Soc Sci Med* 2010; **70**(11): 1806-1815.
19. Berge JM, Arikian A, Doherty WJ, et al. Healthful Eating and Physical Activity in the Home Environment: Results from Multifamily Focus Groups. *J Nutr Educ Behav* 2012; **44**(2): 123-131.
20. Berge JM, Wall M, Bauer KW, et al. Parenting Characteristics in the Home Environment and Adolescent Overweight: A Latent Class Analysis. *Obesity* 2010; **18**(4): 818-825.
21. Berke EM, Koepsell TD, Moudon AV, et al. Association of the Built Environment with Physical Activity and Obesity in Older Persons. *Am J Public Health* 2007; **97**(3): 486-492.
22. Berthoud HR. The neurobiology of food intake in an obesogenic environment. *Proc Nutr Soc* 2012; **71**(4): 478-487.
23. Binns HJ, Forman JA, Karr CJ, et al. The Built Environment: Designing Communities to Promote Physical Activity in Children. *Pediatrics* 2009; **123**(6): 1591-1598.
24. Birch LL, Anzman SL. Learning to Eat in an Obesogenic Environment: A Developmental Systems Perspective on Childhood Obesity. *Child Development Perspectives* 2010; **4**(2): 138-143.
25. Blanck HM, Kim SA. Creating Supportive Nutrition Environments for Population Health Impact and Health Equity: An Overview of the Nutrition and Obesity Policy Research and Evaluation Network's Efforts. *Am J Prev Med* 2012; **43**(3): S85-S90.
26. Blondel VD, Guillaume JL, Lambiotte R, et al. Fast unfolding of communities in large networks. *J Stat Mech: Theory and Exp* 2008; **10**: P10008.
27. Boardman JD, Roettger ME, Domingue BW, et al. Gene–environment interactions related to body mass: School policies and social context as environmental moderators. *Journal of Theoretical Politics* 2012; **24**(3): 370-388.
28. Bocarro JN, Kanters MA, Cerin E, et al. School sport policy and school-based physical activity environments and their association with observed physical activity in middle school children. *Health & Place* 2012; **18**(1): 31-38.
29. Bodor JN, Rice JC, Farley TA, et al. The Association between Obesity and Urban Food Environments. *Journal of Urban Health* 2010; **87**(5) : 771-781.
30. Boone-Heinonen J, Gordon-Larsen P, Guilkey DK, et al. Environment and physical activity dynamics: The role of residential self-selection. *Psychology of Sport and Exercise* 2011; **12**(1): 54-60.
31. Boone-Heinonen J, Gordon-Larsen P. Obesogenic Environments in Youth: Concepts an Methods from a Longitudinal National Sample. *Am J Prev Med* 2012; **42**(5): e37-e46.

32. Boone-Heinonen J, Guilkey DK, Evenson KR, et al. Residential self-selection bias in the estimation of built environment effects on physical activity between adolescence and young adulthood. *International Journal of Behavioral Nutrition and Physical Activity* 2010; **7**(1):70.
33. Booth KM, Pinkston MM, Poston WSC. Obesity and the Built Environment. *J Am Diet Assoc* 2005; **105**(5): 110-117.
34. Booth SL, Sallis JF, Ritenbaugh C, et al. Environmental and societal factors affect food choice and physical activity: rationale, influences, and leverage points. *Nutrition Reviews* 2001; **59**: S21-39.
35. Bouchard C. Gene-Environment Interactions in Etiology of Obesity: Defining the Fundamentals. *Obesity* 2008; **16**(3): S5-S10.
36. Bouret S, Levin BE, Ozanne SE. Gene-Environment Interactions Controlling Energy and Glucose Homeostasis and the Developmental Origins of Obesity. *Physiol Rev* 2015; **95**(1): 47-82.
37. Bower JK, Hales DP, Tate DF, et al. The Childcare Environment and Children's Physical Activity. *Am J Prev Med* 2008; **34**(1): 23-29.
38. Boyle M, Lawrence S, Schwarte L, et al. Health Care Providers' Perceived Role in Changing Environments to Promote Healthy Eating and Physical Activity: Baseline Findings From Health Care Providers Participating in the Healthy Eating, Active Communities Program. *Pediatrics* 2009; **123**(5): S293-S300.
39. Briefel RR, Crepinsek MK, Cabili C, et al. School Food Environments and Practices Affect Dietary Behaviors of US Public School Children. *J Am Diet Assoc* 2009; **109**(2): S91-S107.
40. Brito EC, Vimaleswaran KS, Brage S, et al. *PPARGC1A* sequence variation and cardiovascular risk-factor levels: a study of the main genetic effects and gene × environment interactions in children from the European Youth Heart Study. *Diabetologia* 2009; **52**(4): 609-613.
41. Bullock SL, Craypo L, Clark SE, et al. Food and Beverage Environment Analysis and Monitoring System: A Reliability Study in the School Food and Beverage Environment. *J Am Diet Assoc* 2010; **110**(7): 1084-1088.
42. Burdette AM, Needham BL. Neighborhood Environment and Body Mass Index Trajectories From Adolescence to Adulthood. *J Adolesc Health* 2012; **50**(1): 30-37.
43. Burgoine T, Alvanides S, Lake AA. Creating 'obesogenic realities'; do our methodological choices make a difference when measuring the food environment? *International Journal of Health Geographics* 2013; **12**(1): 33.
44. Burgoine T, Monsivais P. Characterising food environment exposure at home, at work, and along commuting journeys using data on adults in the UK. *International Journal of Behavioral Nutrition and Physical Activity* 2013; **10**(1): 85.
45. Cameron N. Growth Patterns in Adverse Environments. *American Journal of Human Biology* 2007; **19**(5): 615-621.
46. Campbell KJ, Crawford DA, Ball K. Family food environment and dietary behaviors likely to promote fatness in 5-6 year old children. *International Journal of Obesity* 2006; **30**(8): 1272-1280.
47. Campbell KJ, Crawford DA, Salmon J, et al. Associations Between the Home Food Environment and Obesity-promoting Eating Behaviors in Adolescence. *Obesity* 2007; **15**(3): 719-730.

48. Carels RA, Konrad K, Young KM, et al. Taking control of your personal eating and exercise environment: A weight maintenance program. *Eating Behaviors* 2008; **9**(2): 228-237.
49. Carroll-Scott A, Gilstad-Hayden K, Rosenthal L, et al. Disentangling neighborhood contextual associations with child body mass index, diet, and physical activity: The role of built, socioeconomic, and social environments. *Soc Sci Med* 2013; **95**: 106-114.
50. Carson V, Kuhle S, Spence JC, et al. Parents' Perception of Neighbourhood Environment as a Determinant of Screen Time, Physical Activity and Active Transport. *Can J Public Health* 2010; **101**(2): 124-127.
51. Carter MA, Dubois L, Tremblay MS, et al. Trajectories of Childhood Weight Gain: The Relative Importance of Local Environment versus Individual Social and Early Life Factors. *PLoS ONE* 2012; **7**(10): e47065.
52. Carter MA, Swinburn B. Measuring the 'obesogenic' food environment in New Zealand primary schools. *Health Promotion International* 2004; **19**(1): 15-20.
53. Casey AA, Elliott M, Glanz K, et al. Impact of the food environment and physical activity environment on behaviors and weight status in rural U.S. communities. *Prev Med* 2008; **47**(6): 600-604.
54. Caspi CE, Sorensen G, Subramanian SV, et al. The local food environment and diet: A systematic review. *Health & Place* 2012; **18**(5): 1172-1187.
55. Cavanaugh E, Mallya G, Brensinger C, et al. Nutrition environments in corner stores in Philadelphia. *Prev Med* 2013; **56**(2): 149-151.
56. Celis-Morales CA, Perez-Bravo F, Ibañes L, et al. Insulin Resistance in Chileans of European and Indigenous Descent: Evidence for an Ethnicity x Environment Interaction. *PLoS ONE* 2011; **6**(9): e24690.
57. Cerin E, Conway TL, Cain KL, et al. Sharing good NEWS across the world: developing comparable scores across 12 countries for the neighborhood environment walkability scale (NEWS). *BMC Public Health* 2013; **13**:309.
58. Cervero R, Sarmiento OL, Jacoby E, et al. Influences of Built Environments on Walking and Cycling: Lessons from Bogotá. *International Journal of Sustainable Transportation* 2009; **3**(4): 203-226.
59. Cetateanu A, Jones A. Understanding the relationship between food environments, deprivation and childhood overweight and obesity: Evidence from a cross sectional England-wide study. *Health & Place* 2014; **27**(100): 68-76.
60. Chadegani AA, Salehi H, Yunus MM, et al. A comparison between two main academic literature collections: Web of Science and Scopus databases. *Asian Social Science* 2013; **9**(5): 18-26.
61. Chaput JP, Klingenberg L, Astrup A, et al. Modern sedentary activities promote overconsumption of food in our current obesogenic environment. *Obesity Reviews* 2011; **12**(501): e12-e20.
62. Chaudhury H, Mahmood A, Michael YL, et al. The influence of neighborhood residential density, physical and social environments on older adults' physical activity: An exploratory study in two metropolitan areas. *Journal of Aging Studies* 2012; **26**(1): 35-43.
63. Chen H, Simar D, Morris MJ. Hypothalamic Neuroendocrine Circuitry is Programmed by Maternal Obesity: Interaction with Postnatal Nutritional Environment. *PLoS ONE* 2009; **4**(7): e6259.

64. Christian H, Giles-Corti B, Knuiman M, et al. The influence of the built environment, social environment and health behaviors on body mass index. Results from RESIDE. *Prev Med* 2011; **53**(1/2): 57-60.
65. Chunara R, Bouton L, Ayers JW, et al. Assessing the Online Social Environment for Surveillance of Obesity Prevalence. *PloS ONE* 2013; **8**(4): e61373.
66. Cohen DA. Obesity and the built environment: changes in environmental cues cause energy imbalances. *International Journal of Obesity* 2008; **32**(S7): S137-S142.
67. Coleman KJ, Geller KS, Rosenkranz RR, et al. Physical Activity and Healthy Eating in the After-School Environment. *J Sch Health* 2008; **78**(12): 633-640.
68. Cornes BK, Lind PA, Medland SE, et al. Replication of the association of common rs9939609 variant of FTO with increased BMI in an Australian adult twin population but no evidence for gene by environment (G × E) interaction. *International Journal of Obesity* 2009; **33**(1): 75-79.
69. Costanza MC, Cayanis E, Ross BM, et al. Relative Contributions of Genes, Environment, and Interactions to Blood Lipid Concentrations in a General Adult Population. *Am J Epidemiol* 2005; **161**(8): 714-724.
70. Couch SC, Glanz K, Zhou C, et al. Home Food Environment in Relation to Children's Diet Quality and Weight Status. *J Acad Nutr Diet* 2014; **114**(10): 1569-1579.
71. Crawford D, Cleland V, Timperio A, et al. The longitudinal influence of home and neighbourhood environments on children's body mass index and physical activity over 5 years: the CLAN study. *International Journal of Obesity* 2010; **34**(7): 1177-1187.
72. Crossman A, Sullivan DA, Benin M. The family environment and American adolescents' risk of obesity as young adults. *Soc Sci Med* 2006; **63**(9): 2255-2267.
73. Cullen KW, Hartstein J, Reynolds KD, et al. Improving the School Food Environment: Results from a Pilot Study in Middle Schools. *J Am Diet Assoc* 2007; **107**(3): 484-489.
74. Cullen KW, Smalling AL, Thompson D, et al. Creating Healthful Home Food Environments: Results of a Study with Participants in the Expanded Food and Nutrition Education Program. *J Nutr Educ Behav* 2009; **41**(6): 380-388.
75. Cummins S, Macintyre S. Are secondary data sources on the neighbourhood food environment accurate? Case-study in Glasgow, UK. *Prev Med* 2009; **49**(6): 527-528.
76. Dabelea D, Crume T. Maternal Environment and the Transgenerational Cycle of Obesity and Diabetes. *Diabetes* 2011; **60**(7): 1849-1855.
77. Dahly DH, Adair LS. Quantifying the urban environment: A scale measure of urbanicity outperforms the urban–rural dichotomy. *Soc Sci Med* 2007; **64**(7): 1407-1419.
78. Day PL, Pearce J. Obesity-Promoting Food Environments and the Spatial Clustering of Food Outlets Around Schools. *Am J Prev Med* 2011; **40**(2): 113-121.
79. De Castro JM. Genes, the environment and the control of food intake. *Br J Nutr* 2004; **92**(S1): S59-S62.
80. De Vet E, De Wit JBF, Luszczynska A, et al. Access to excess: how do adolescents deal with unhealthy foods in their environment? *European Journal of Public Health* 2013; **23**(5): 752-756.
81. Dengel DR, Hearst MO, Harmon JH, et al. Does the built environment relate to the metabolic syndrome in adolescents? *Health & Place* 2009; **15**(4): 946-951.

82. Ding D, Adams MA, Sallis JF, et al. Perceived neighborhood environment and physical activity in 11 countries: do associations differ by country? *International Journal of Behavioral Nutrition and Physical Activity* 2013; **10**(1): 57.
83. Ding D, Gebel K. Built environment, physical activity, and obesity: What have we learned from reviewing the literature? *Health & Place* 2012; **18**(1): 100-105.
84. Ding D, Sallis JF, Norman GJ, et al. Community Food Environment, Home Food Environment, and Fruit and Vegetable Intake of Children and Adolescents. *J Nutr Educ Behav* 2012; **44**(6): 634-638.
85. Dodson JL, Hsiao YC, Kasat-Shors M, et al. Formative Research for a Healthy Diet Intervention Among Inner-City Adolescents: The Importance of Family, School and Neighborhood Environment. *Ecology of Food and Nutrition* 2009; **48**(1): 39-58.
86. Downs SM, Arnold A, Marshall D, et al. Associations among the food environment, diet quality and weight status in Cree children in Québec. *Public Health Nutrition* 2009; **12**(9): 1504-1411.
87. Drewnowski A. Obesity and the food environment: Dietary energy density and diet costs. *Am J Prev Med* 2004; **27**(3): 154-162.
88. Drummond RL, Staten LK, Sanford MR, et al. Steps to a Healthier Arizona: A Pebble in the Pond: The Ripple Effect of an Obesity Prevention Intervention Targeting the Child Care Environment. *Health Promotion Practice* 2009; **10**(2): 156S-167S.
89. Dubowitz T, Ghosh-Dastidar M, Eibner C, et al. The Women's Health Initiative: The Food Environment, Neighborhood Socioeconomic Status, BMI, and Blood Pressure. *Obesity* 2012; **20**(4): 862-871.
90. Due P, Damsgaard MT, Rasmussen M, et al. Socioeconomic position, macroeconomic environment and overweight among adolescents in 35 countries. *International Journal of Obesity* 2009; **33**(10): 1084-1093.
91. Duncan DT, Castro MC, Gortmaker SL, et al. Racial differences in the built environment—body mass index relationship? A geospatial analysis of adolescents in urban neighborhoods. *International Journal of Health Geographics* 2012; **11**(1): 11.
92. Durand CP, Andalib M, Dunton GF, et al. A systematic review of built environment factors related to physical activity and obesity risk: implications for smart growth urban planning. *Obesity Reviews* 2011; **12**(5): e173-e182.
93. Durant N, Harris SK, Doyle S, et al. Relation of School Environment and Policy to Adolescent Physical Activity. *J Sch Health* 2009; **79**(4): 153-159.
94. Edwards KL, Clarke GP. The design and validation of a spatial microsimulation model of obesogenic environments for children in Leeds, UK: SimObesity. *Soc Sci Med* 2009; **69**(7): 1127-1134.
95. Edwards TL, Velez Edwards DR, Villegas R, et al. HTR1B, ADIPOR1, PPARGC1A, and CYP19A1 and Obesity in a Cohort of Caucasians and African Americans: An Evaluation of Gene-Environment Interactions and Candidate Genes. *Am J Epidemiol* 2012; **175**(1): 11-21.
96. Egger G. Health, "Illth," and Economic Growth: Medicine, Environment, and Economics at the Crossroads. *Am J Prev Med* 2009; **37**(1): 78-83.
97. Epstein LH, Raja S, Daniel TO, et al. The Built Environment Moderates Effects of Family-Based Childhood Obesity Treatment over 2 Years. *Ann Behav Med* 2012; **44**(2): 248-258.

98. Eriksson JG. Epidemiology, genes and the environment: lessons learned from the Helsinki Birth Cohort Study. *J Intern Med* 2007; **261**(5): 418-425.
99. Evans AE, Dave J, Tanner A, et al. Changing the Home Nutrition Environment, Effects of a Nutrition and Media Literacy Pilot Intervention. *Fam Community Health* 2006; **29**(1): 43-54.
100. Faith MS, Berkowitz RI, Stallings VA, et al. Parental Feeding Attitudes and Styles and Child Body Mass Index: Prospective Analysis of a Gene-Environment Interaction. *Pediatrics* 2004; **114**(4): e429-e436.
101. Farley TA, Rice J, Bodor JN, et al. Measuring the food environment: Shelf space of fruits, vegetables, and snack foods in stores. *J Urban Health* 2009; **86**(5): 672–82.
102. Feng J, Glass TA, Curriero FC, et al. The built environment and obesity: A systematic review of the epidemiologic evidence. *Health & Place* 2010; **16**(2): 175-190.
103. Fleten C, Nystad W, Stigum H, et al. Parent-Offspring Body Mass Index Associations in the Norwegian Mother and Child Cohort Study: A Family-based Approach to Studying the Role of the Intrauterine Environment in Childhood Adiposity. *Am J Epidemiol* 2012; **176**(2): 83-92.
104. Floyd MF, Taylor WC, Whitt-Glover M. Measurement of Park and Recreation Environments That Support Physical Activity in Low-Income Communities of Color: Highlights of Challenges and Recommendations. *Am J Prev Med* 2009; **36**(4): S156-S160.
105. Font JC, Fabbri J, Gil D. Decomposing cross-country differences in levels of obesity and overweight: Does the social environment matter? *Soc Sci Med* 2010; **70**(8): 1185-1193.
106. Fontaine KR, Robertson HT, Holst C, et al. Is Socioeconomic Status of the Rearing Environment Causally Related to Obesity in the Offspring? *PLoS ONE* 2011; **6**(11): e27692.
107. Forsyth A, Van Riper D, Larson N, et al. Creating a replicable, valid cross-platform buffering technique: The sausage network buffer for measuring food and physical activity built environments. *International Journal of Health Geographics* 2012; **11**(1): 14.
108. Fox MK, Dodd AH, Wilson A. Association between School Food Environment and Practices and Body Mass Index of US Public School Children. *J Am Diet Assoc* 2009; **109**(2): S108-S117.
109. Frank L, Kavage S. A National Plan for Physical Activity: The Enabling Role of the Built Environment. *Journal of Physical Activity and Health* 2009; **6**(2): S186-S195.
110. Frank LD, Engelke P. Multiple Impacts of the Built Environment of Public Health: Walkable Places and the Exposure to Air Pollution. *International Regional Science Review* 2005; **28**(2): 193-216.
111. Frank LD, Saelens BE, Powell KE, et al. Stepping towards causation: Do built environments or neighborhood and travel preferences explain physical activity, driving, and obesity? *Soc Sci Med* 2007; **65**(9): 1898-1914.
112. Frank LD, Saelens BS, Chapman J, et al. Objective Assessment of Obesogenic Environments in Youth: Geographic Information System Methods and Spatial Findings from the Neighborhood Impact on Kids Study. *Am J Prev Med* 2012; **42**(5): e47-e55.

113. Franks PW, Ravussin E, Hanson RL, et al. Habitual physical activity in children: the role of genes and the environment. *Am J Clin Nutr* 2005; **82**(4): 901-908.
114. Franzini L, Elliott MN, Cuccaro P, et al. Influences of Physical and Social Neighborhood Environments on Children's Physical Activity and Obesity. *Am J Public Health* 2009; **99**(2): 271-278.
115. French SA, Harnack LJ, Hannan PJ, et al. Worksite environment intervention to prevent obesity among metropolitan transit workers. *Prev Med* 2010; **50**(4): 180-185.
116. French SA, Story M, Fulkerson JA, et al. Food Environment in Secondary Schools: À La Carte, Vending Machines, and Food Policies and Practices. *Am J Public Health* 2003; **93**(7): 1161-1168.
117. Fulkerson JA, Rydell S, Kubik MY, et al. Healthy Home Offerings via the Mealtime Environment (HOME): Feasibility, Acceptability, and Outcomes of a Pilot Study. *Obesity* 2010; **18**(1): S69-S74.
118. Gargani S, Thévenet J, Yuan JE, et al. Adaptive changes of human islets to an obesogenic environment in the mouse. *Diabetologia* 2013; **56**(2): 350-358.
119. Gattshall ML, Shoup JA, Marshall JA, et al. Validation of a survey instrument to assess home environments for physical activity and healthy eating in overweight children. *International Journal of Behavioral Nutrition and Physical Activity* 2008; **5**(1):3.
120. Gerozissis K. Brain insulin, energy and glucose homeostasis; genes, environment and metabolic pathologies. *Eur J Clin Pharmacol* 2008; **585**(1): 38-49.
121. Giabbanelli PJ, Alimadad A, Dabbaghian V, et al. Modeling the influence of social networks and environment on energy balance and obesity. *Journal of Computational Science* 2012; **3**(1/2): 17-27.
122. Gibson DM. The Neighborhood Food Environment and Adult Weight Status: Estimates From Longitudinal Data. *Am J Public Health* 2011; **101**(1): 71-78.
123. Gilliland JA, Rangel CY, Healy MA, et al. Linking Childhood Obesity to the Built Environment: A Multi-level Analysis of Home and School Neighbourhood Factors Associated With Body Mass Index. *Can J Public Health* 2012; **103**(3): S15-S21.
124. Giskes K, Van Lenthe F, Avendano-Pabon M, et al. A systematic review of environmental factors and obesogenic dietary intakes among adults: are we getting closer to understanding obesogenic environments? *Obesity Reviews* 2011; **12**(5): e95-e106.
125. Gittelsohn J, Franceschini MCT, Rasooly IR, et al. Understanding the Food Environment in a Low-Income Urban Setting: Implications for Food Stores Interventions. *Journal of Hunger and Environmental Nutrition* 2008; **2**(2/3): 33-50.
126. Gittelsohn J, Sharma S. Physical, Consumer, and Social Aspects of Measuring the Food Environment Among Diverse Low-Income Populations. *Am J Prev Med* 2009; **36**(4): S161-S165.
127. Glanz K, Sallis JF, Saelens BE, et al. Nutrition Environment Measures Survey in Stores (NEMS-S). Development and Evaluation. *Am J Prev Med* 2007; **32**(4): 282-289.

128. Glanz K. Measuring Food Environments: A Historical Perspective. *Am J Prev Med* 2009; **36**(4): S93-S98.
129. Gorin AA, Raynor HA, Fava J. Randomized controlled trial of a comprehensive home environment-focused weight-loss program for adults. *Health Psychol* 2013; **32**(2): 128-137.
130. Gorin AA, Raynor HA, Niemeier HM, et al. Home grocery delivery improves the household food environments of behavioral weight loss participants: results of an 8-week pilot study. *International Journal of Behavioral Nutrition and Physical Activity* 2007; **4**:58.
131. Gorin AA, Wing RR, Fava JL, et al. Weight loss treatment influences untreated spouses and the home environment: evidence of a ripple effect. *International Journal of Obesity* 2008; **32**(11): 1678-1684.
132. Gorski JN, Dunn-Meynell AA, Hartman TG, et al. Postnatal environment overrides genetic and prenatal factors influencing offspring obesity and insulin resistance. *Am J Physiol Regul Integr Comp Physiol* 2006; **291**(3): R768-R778.
133. Gortmaker SL, Swinburn BA, Levy D, et al. Changing the future of obesity: science, policy, and action. *Lancet* 2011; **378**(9793): 838-847.
134. Gose M, Plachta-Danielzik S, Willié B, et al. Longitudinal Influences of Neighbourhood Built and Social Environment on Children's Weight Status. *Int J Environ Res Public Health* 2013; **10**(10): 5083-5096.
135. Grafova IB. Overweight children: Assessing the contribution of the built environment. *Prev Med* 2008; **47**(3): 304-308.
136. Granich J, Rosenberg M, Knuiman M, et al. Understanding children's sedentary behaviour: a qualitative study of the family home environment. *Health Education Research* 2010; **25**(2): 199-210.
137. Granich J, Rosenberg M, Knuiman MW, et al. Individual, Social and Physical Environment Factors Associated With Electronic Media Use Among Children: Sedentary Behavior at Home. *Journal of Physical Activity and Health* 2011; **8**: 613-625.
138. Grove ML, Morrison A, Folsom AR, et al. Gene-environment interaction and the GNB3 gene in the Atherosclerosis Risk in Communities Study. *International Journal of Obesity* 2007; **31**(6): 919-926.
139. Grow HM, Saelens BE, Kerr J, et al. Where Are Youth Active? Roles of Proximity, Active Transport, and Built Environment. *Med Sci Sports Exerc* 2008; **40**(12): 2071-2079.
140. Gubbels JS, Kremers SPJ, Stafleu A, et al. Child-care environment and dietary intake of 2- and 3-year-old children. *J Hum Nutr Diet* 2010; **23**(1): 97-101.
141. Gubbels JS, Kremers SPJ, Van Kann DHH, et al. Interaction between physical environment, social environment, and child characteristics in determining physical activity at child care. *Health Psychol* 2011; **30**(1): 84-90.
142. Guerrieri R, Nederkoorn C, Jansen A. The interaction between impulsivity and a varied food environment: its influence on food intake and overweight. *International Journal of Obesity* 2008; **32**(4): 708-714.
143. Guo JY, Gandavarapu S. An economic evaluation of health-promotive built environment changes. *Prev Med* 2010; **50**: S44-S49.
144. Gustafson AA, Sharkey J, Samuel-Hodge CD, et al. Perceived and objective measures of the food store environment and the association with weight and diet

among low-income women in North Carolina. *Public Health Nutrition* 2011; **14**(6): 1032-1038.
145. Haberstick BC, Lessem JM, McQueen MB, et al. Stable Genes and Changing Environments: Body Mass Index Across Adolescence and Young Adulthood. *Behav Genet* 2010; **40**(4): 495-504.
146. Harris JK, Lecy J, Hipp JA, et al. Mapping the development of research on physical activity and the built environment. *Prev Med* 2013; **57**(5): 533-540.
147. Harzing AW, Alakangas S. Google Scholar, Scopus and the Web of Science: A longitudinal and cross-disciplinary comparison. *J Scientometrics* 2016; **106**(2): 787–804.
148. Haug E, Torsheim T, Sallis JF, et al. The characteristics of the outdoor school environment associated with physical activity. *Health Education Research* 2010; **25**(2): 248-256.
149. Hayne CL, Moran PA, Ford MM. Regulating environments to reduce obesity. *J Public Health Policy* 2004; **25**(3/4): 391-407.
150. He M, Tucker P, Gilliland J, et al. The Influence of Local Food Environments on Adolescents' Food Purchasing Behaviors. *Int J Environ Res Public Health* 2012; **9**(4): 1458-1471.
151. Hearst MO, Pasch KE, Laska MN. Urban v. suburban perceptions of the neighbourhood food environment as correlates of adolescent food purchasing. *Public Health Nutrition* 2012; **15**(2): 299-306.
152. Heikkinen S, Argmann C, Feige JN, et al. The Pro12Ala PPARγ2 Variant Determines Metabolism at the Gene-Environment Interface. *Cell Metabolism* 2009; **9**(1): 88-98.
153. Heitmann BL, Westerterp KR, Loos RJF, et al. Obesity: lessons from evolution and the environment. *Obesity Reviews* 2012; **13**(10): 910-922.
154. Henderson KE, Grode GM, Middleton AE, et al. Validity of a Measure to Assess the Child-Care Nutrition and Physical Activity Environment. *J Am Diet Assoc* 2011; **111**(9): 1306-1313.
155. Hendrie GA, Coveney J, Cox DN. Defining the complexity of childhood obesity and related behaviours within the family environment using structural equation modelling. *Public Health Nutrition* 2012; **15**(1): 48-57.
156. Hinde S, Dixon J. Changing the obesogenic environment: insights from a cultural economy of car reliance. *Transportation Research Part D* 2005; **10**(1): 31-53.
157. Ho SY, Wong BYM, Lo WS, et al. Neighbourhood food environment and dietary intakes in adolescents: Sex and perceived family affluence as moderators. *International Journal of Pediatric Obesity* 2010; **5**(5): 420-427.
158. Hobin E, Leatherdale S, Manske S. A multilevel examination of factors of the school environment and time spent in moderate to vigorous physical activity among a sample of secondary school students in grades 9–12 in Ontario, Canada. *Int J Public Health* 2012; **57**(4): 699-709.
159. Holsten JE, Deatrick JA, Kumanyika S, et al. Children's food choice process in the home environment. A qualitative descriptive study. *Appetite* 2012; **58**(1): 64-73.
160. Horner MW, Wood BS. Capturing individuals' food environments using flexible space-time accessibility measures. *Applied Geography* 2014; **51**: 99-107.
161. Hosler AS, Dharssi A. Identifying Retail Food Stores to Evaluate the Food Environment. *Am J Prev Med* 2010; **39**(1): 41-44.

162. Hoyos Cillero I, Jago R. Sociodemographic and home environment predictors of screen viewing among Spanish school children. *Journal of Public Health* 2011; **33**(3): 392-402.
163. Huberty JL, Dodge T, Peterson K, et al. Active Omaha: The Journey of an Active Living Environment. *Am J Prev Med* 2009; **37**(6): S428-S435.
164. Hurvitz PM, Moudon AV. Home Versus Nonhome Neighborhood: Quantifying Differences in Exposure to the Built Environment. *Am J Prev Med* 2012; **42**(4): 411-417.
165. Hutchinson PL, Nicholas Bodor J, Swalm CM, et al. Neighbourhood food environments and obesity in southeast Louisiana. *Health & Place* 2012; **18**(4): 854-860.
166. Imhoff BR, Hansen JM. Extracellular redox environments regulate adipocyte differentiation. *Differentiation* 2010; **80**(1): 31-39.
167. Ingram DA, Lien IZ, Mead LE, et al. In Vitro Hyperglycemia or a Diabetic Intrauterine Environment Reduces Neonatal Endothelial Colony-Forming Cell Numbers and Function. *Diabetes* 2008; **57**(3): 724-731.
168. Inoue S, Murase N, Shimomitsu T, et al. Association of physical activity and neighborhood environment among Japanese adults. *Prev Med* 2009; **48**(4): 321-325.
169. Jago R, Stamatakis E, Gama A, et al. Parent and Child Screen-Viewing Time and Home Media Environment. *Am J Prev Med* 2012; **43**(2): 150-158.
170. Janevic T, Borrell LN, Savitz DA, et al. Neighbourhood food environment and gestational diabetes in New York City. *Paediatr Perinat Epidemiol* 2010; **24**(3): 249-254.
171. Jeffery RW, McGuire MT, Brelje KL, et al. Recruitment to Mail and Telephone Interventions for Obesity in a Managed Care Environment: The Weigh-To-Be Project. *Am J Manag Care* 2004; **10**(6): 378-382.
172. Jilcott SB, Wade S, McGuirt JT, et al. The association between the food environment and weight status among eastern North Carolina youth. *Public Health Nutrition* 2011; **14**(9): 1610-1617.
173. Johnson L, Van Jaarsveld JHM, Wardle J. Individual and family environment correlates differ for consumption of core and non-core foods in children. *B J Nutr* 2011; **105**(6): 950-959.
174. Johnson R, Welk G, Saint-Maurice PF, et al. Parenting Styles and Home Obesogenic Environments. *Int J Environ Res Public Health* 2012; **9**(4): 1411-1426.
175. Jun HJ, Corliss HL, Boynton-Jarrett R, et al. Growing up in a domestic violence environment: relationship with developmental trajectories of body mass index during adolescence into young adulthood. *J Epidemiol Community Health* 2012; **66**(7): 629-635.
176. Kaiser N, Nesher R, Donath MY, et al. Psammomys Obesus, a Model for Environnment-Gene Interactions in Type 2 Diabetes. *Diabetes* 2005; **54**(2): S137-S144.
177. Karnehed N, Tynelius P, Heitmann BL, et al. Physical activity, diet and gene–environment interactions in relation to body mass index and waist circumference: The Swedish Young Male Twins Study. *Public Health Nutrition* 2006; **9**(7): 851-858.
178. Katzmarzyk PT, Barreira TV, Broyles ST, et al. The International Study of Childhood Obesity, Lifestyle and the Environment (ISCOLE): design and methods. *BMC Public Health* 2013; **13**: 900.

179. Kegler MC, Escoffery C, Alcantara I, et al. A qualitative examination of home and neighborhood environments for obesity prevention in rural adults. *International Journal of Behavioral Nutrition and Physical Activity* 2008; **5**(1): 65.
180. Keller KL, Pietrobelli A, Johnson SL, et al. Maternal restriction of children's eating and encouragements to eat as the 'non-shared environment': a pilot study using the child feeding questionnaire. *International Journal of Obesity* 2006; **30**(11): 1670-1675.
181. Kent CF, Daskalchuk T, Cook L, et al. The Drosophila foraging Gene Mediates Adult Plasticity and Gene–Environment Interactions in Behaviour, Metabolites, and Gene Expression in Response to Food Deprivation. *PLoS Genetics* 2009; **5**(8): e1000609.
182. Kent MP, Dubois L, Wanless A. A Nutritional Comparison of Foods and Beverages Marketed to Children in Two Advertising Policy Environments. *Obesity* 2012; **20**(9): 1829-1837.
183. Kent MP, Dubois L, Wanless A. Food marketing on children's television in two different policy environments. *International Journal of Pediatric Obesity* 2011; **6**(2): e433-e441.
184. Kerr J, Norman GJ, Adams MA, et al. Do neighborhood environments moderate the effect of physical activity lifestyle interventions in adults? *Health & Place* 2010; **16**(5): 903-908.
185. Kerr J, Sallis JF, Owen N, et al. Advancing Science and Policy Through a Coordinated International Study of Physical Activity and Built Environments: IPEN Adult Methods. *Journal of Physical Activity and Health* 2013; **10**: 581-601.
186. Kershaw KN, Albrecht SS, Carnethon MR. Racial and Ethnic Residential Segregation, the Neighborhood Socioeconomic Environment, and Obesity Among Blacks and Mexican Americans. *Am J Epidemiol* 2013; **177**(4): 299-309.
187. Kim S, Adamson KC, Balfanz DR, et al. Development of the Community Healthy Living Index: A tool to foster healthy environments for the prevention of obesity and chronic disease. *Prev Med* 2010; **50**: S80-S85.
188. Kipke MD, Iverson E, Moore D, et al. Food and Park Environments: Neighborhood-level Risks for Childhood Obesity in East Los Angeles. *J Adolesc Health* 2007; **40**(4): 325-333.
189. Kirk SFL, Penney TL, McHugh TLF. Characterizing the obesogenic environment: the state of the evidence with directions for future research. *Obesity Reviews* 2010; **11**(2): 109-117.
190. Koch LG, Britton SL. Development of Animal Models to Test the Fundamental Basis of Gene-Environment Interactions. *Obesity* 2008; **16**: S28-S32.
191. Koohsari MJ, Badland H, Giles-Corti B. (Re)Designing the built environment to support physical activity: Bringing public health back into urban design and planning. *Cities* 2013; **35**: 294-298.
192. Kosti RI, Panagiotakos DB, Tountas Y, et al. Parental Body Mass Index in association with the prevalence of overweight/obesity among adolescents in Greece; dietary and lifestyle habits in the context of the family environment: The Vyronas study. *Appetite* 2008; **51**(1): 218-222.
193. Kozak LP, Newman S, Chao PM, et al. The Early Nutritional Environment of Mice Determines the Capacity for Adipose Tissue Expansion by Modulating Genes of Caveolae Structure. *PloS ONE* 2010; **5**(6): e11015.

194. Kral T, Stunkard AJ, Berkowitw RI, et al. Daily food intake in relation to dietary energy density in the free-living environment: a prospective analysis of children born at different risk of obesity1,2,3. *Am J Clin Nutr* 2007; **86**(1): 41-47.
195. Kral TVE, Rauh EM. Eating behaviors of children in the context of their family environment. *Physiol Behav* 2010; **100**(5): 567-573.
196. Kriemler S, Manser-Wenger S, Zahner L, et al. Reduced cardiorespiratory fitness, low physical activity and an urban environment are independently associated with increased cardiovascular risk in children. *Diabetologia* 2008; **51**(8): 1408-1415.
197. Kwate NOA, Yau CY, Loh JM, et al. Inequality in obesigenic environments: Fast food density in New York City. *Health & Place* 2009; **15**(1): 364-373.
198. Lake A, Townshend T. Obesogenic environments: exploring the built and food environments. *JRSH* 2006; **126**(6): 262-267.
199. Lake AA, Townshend T, Alvanides S, et al. Diet, physical activity, sedentary behaviour and perceptions of the environment in young adults. *J Hum Nutr Diet* 2009; **22**(5): 444-454.
200. Lambin S, Van Bree R, Caluwaerts, S, et al. Adipose tissue in offspring ofLeprdb/+mice: early-life environment vs. genotype. *Am J Physiol Endocrinol Metab* 2007; **292**(1): E262-E271
201. Langevin DD, Kwiatkowski C, McKay G, et al. Evaluation of Diet Quality and Weight Status of Children from a Low Socioeconomic Urban Environment Supports "At Risk" Classification. *Am J Diet Assoc* 2007; **107**(11): 1973-1977.
202. Lanningham-Foster L, Foster RC, McCrady SK, et al. Changing the School Environment to Increase Physical Activity in Children. *Obesity* 2008; **16**(8): 1849-1853.
203. Laska MN, Hearst MO, Forsyth A, et al. Neighbourhood food environments: are they associated with adolescent dietary intake, food purchases and weight status? *Public Health Nutrition* 2010; **13**(11): 1757-1763.
204. Lawrence S, Boyle M, Craypo L, et al. The Food and Beverage Vending Environment in Health Care Facilities Participating in the Healthy Eating, Active Communities Program. *Pediatrics* 2009; **123**: S287-S292.
205. Leal C, Chaix B. The influence of geographic life environments on cardiometabolic risk factors: a systematic review, a methodological assessment and a research agenda. *Obesity Reviews* 2011; **12**(3): 217-230.
206. Leatherdale ST, Papadakis S. A Multi-Level Examination of the Association Between Older Social Models in the School Environment and Overweight and Obesity Among Younger Students. *J Youth Adolescence* 2011; **40**(3): 361-372.
207. Lee IM, Ewing R, Sesso HD. The Built Environment and Physical Activity Levels: The Harvard Alumni Health Study. *Am J Prev Med* 2009; **37**(4): 293-298.
208. Lee SH, Dobrzyn A, Dobrzyn P, et al. Lack of stearoyl-CoA desaturase 1 upregulates basal thermogenesis but causes hypothermia in a cold environment. *J Lipid Res* 2004; **45**(9): 1674-1682.
209. Li F, Harmer P, Cardinal BJ, et al. Built Environment and 1-Year Change in Weight and Waist Circumference in Middle-Aged and Older Adults: Portland Neighborhood Environment and Health Study. *Am J Epidemiol* 2009; **169**(4): 401-408.
210. Li F, Harmer PA, Cardinal BJ, et al. Built Environment, Adiposity, and Physical Activity in Adults Aged 50-75. *Am J Prev Med* 2008; **35**(1): 38-46.

211. Li JV, Reshat R, Wu Q, et al. Experimental bariatric surgery in rats generates a cytotoxic chemical environment in the gut contents. *Frontiers in Microbiology* 2011; **2**(183): 1-9.
212. Li X, Gonzalez O, Shen X, et al. Endothelial Acyl-CoA Synthetase 1 Is Not Required for Inflammatory and Apoptotic Effects of a Saturated Fatty Acid-Rich Environment. *Arterioscler Thromb Vasc Biol* 2013; **33**(2): 232-240.
213. Longacre MR, Primack BA, Owens PM, et al. Public Directory Data Sources Do Not Accurately Characterize the Food Environment in Two Predominantly Rural States. *J Am Diet Assoc* 2011; **111**(4): 557-582.
214. Lopez-Zetina J, Lee H, Friis R. The link between obesity and the built environment. Evidence from an ecological analysis of obesity and vehicle miles of travel in California. *Health & Place* 2006; **12**(4): 656-664.
215. Lovasi GS, Hutson MA, Guerra M, et al. Built Environments and Obesity in Disadvantaged Populations. *Epidemiol Rev* 2009; **31**(1): 7-20.
216. Lovasi GS, Jacobson JS, Quinn JW, et al. Is the Environment Near Home and School Associated with Physical Activity and Adiposity of Urban Preschool Children? *Journal of Urban Health* 2011; **88**(6): 1143-1157.
217. Lowe MR, Butryn ML, Didie ER, et al. The Power of Food Scale. A new measure of the psychological influence of the food environment. *Appetite* 2009; **53**(1): 114-118.
218. Lucan SC, Mitra N. Perceptions of the food environment are associated with fast-food (not fruit-and-vegetable) consumption: findings from multi-level models. *Int J Public Health* 2012; **57**(3): 599-608.
219. Luoto R, Kalliomäki M, Laitinen K, et al. Initial Dietary and Microbiological Environments Deviate in Normal-weight Compared to Overweight Children at 10 Years of Age. *JPGN* 2011; **52**(1): 90-95.
220. Lytle LA. Measuring the Food Environment: State of the Science. *Am J Prev Med* 2009; **36**(4): S134-S144.
221. Macdonald L, Cummins S, Macintyre S. Neighbourhood fast food environment and area deprivation—substitution or concentration? *Appetite* 2007; **49**(1): 251-254.
222. Macdonald L, Ellaway A, Macintyre S. The food retail environment and area deprivation in Glasgow City, UK. *International Journal of Behavioral Nutrition and Physical Activity* 2009; **6**: 52.
223. MacFarlane A, Cleland V, Crawford D, et al. Longitudinal examination of the family food environment and weight status among children. *International Journal of Pediatric Obesity* 2009; **4**(4): 343-352.
224. MacFarlane A, Crawford D, Worsley A. Associations Between Parental Concern for Adolescent Weight and the Home Food Environment and Dietary Intake. *J Nutr Educ Behav* 2010; **42**(3): 152-160.
225. Mackenbach JD, Rutter H, Compernolle S, et al. Obesogenic environments: a systematic review of the association between the physical environment and adult weight status, the SPOTLIGHT project. *BMC Public Health* 2014; **14**(1): 233.
226. MacLeod KE, Gee GC, Crawford P, et al. Evidence-based policy and practice: Neighbourhood environment as a predictor of television watching among girls. *J Epidemiol Community Health* 2008; **62**(4): 288-292.
227. Martin AA, Davidson TL. Human cognitive function and the obesogenic environment. *Physiol Behav* 2014; **136**: 185-193.

228. Mâsse LC, Frosh MM, Chriqui JF, et al. Development of a School Nutrition–Environment State Policy Classification System (SNESPCS). *Am J Prev Med* 2007; **33**(4): S277-S291.
229. McCaffery JM, Papandonatos GD, Bond DS, et al. Gene × environment interaction of vigorous exercise and body mass index among male Vietnam-era twins. *Am J Clin Nutr* 2009; **89**(4): 1011-1018.
230. McLure SA, Summerbell CD, Reilly JJ. Objectively measured habitual physical activity in a highly obesogenic environment. *Child Care Health Dev* 2009; **35**(3): 369-375.
231. Mikkelsen BE. Images of foodscapes: Introduction to foodscape studies and their application in the study of healthy eating out-of-home environments. *Perspectives in Public Health* 2011; **131**(5): 209-216.
232. Miles R, Panton L. The influence of the perceived quality of community environments on low-income women's efforts to walk more. *J Community Health* 2006; **31**(5): 379-392.
233. Miller DP. Associations between the home and school environments and child body mass index. *Soc Sci Med* 2011; **72**(5): 677-684.
234. Mitra R, Buliung RN. Built environment correlates of active school transportation: neighborhood and the modifiable areal unit problem. *Journal of Transport Geography* 2012; **20**(1): 51-61.
235. Mladenovic J, Shea JA, Duffy FD, et al. Variation in Internal Medicine Residency Clinic Practices: Assessing Practice Environments and Quality of Care. *J Gen Intern Med* 2008; **23**(7): 914-920.
236. Mobley LR, Root ED, Finkelstein EA, et al. Environment, Obesity and CardioVascular Disease Risk in Low-Income Women. *Am J Prev Med* 2006; **30**(4): 327-332.
237. Monden CWS, van Lenthe FJ, Mackenback JP. A simultaneous analysis of neighbourhood and childhood socio-economic environment with self-assessed health and health-related behaviours. *Health & Place* 2006; **30**(4): 394-403.
238. Moore K, Roux AVD, Auchincloss A, et al. Home and work neighbourhood environments in relation to body mass index: the Multi-Ethnic Study of Atherosclerosis (MESA). *J Epidemiol Community Health* 2013; **67**(10): 846-853.
239. Moore LV, Roux AVD, Nettelton J, et al. Associations of the local food environment with diet quality-a comparison of assessments based on surveys and geographic information systems: the Multi-Ethnic Study of Atherosclerosis. *Am J Epidemiol* 2008; **167**(8): 917-924.
240. Morland KB, Evenson KR. Obesity prevalence and the local food environment. *Health & Place* 2009; **15**(2): 491-495.
241. Mujahid MS, Roux AVD, Shen M, et al. Relation between Neighborhood Environments and Obesity in the Multi-Ethnic Study of Atherosclerosis. *Am J Epidemiol* 2008; **167**(11): 1349-1357.
242. Nackers LM, Appelhans BM. Food Insecurity Is Linked to a Food Environment Promoting Obesity in Households With Children. *J Nutr Educ Behav* 2013; **45**(6): 780-784.
243. Nanney MS, Nelson T, Wall M et al. State School Nutrition and Physical Activity Policy Environments and Youth Obesity. *Am J Prev Med* 2010; **38**(1): 9-16.

244. Navalpotro L, Regidor E, Ortega P, et al. Area-based socioeconomic environment, obesity risk behaviours, area facilities and childhood overweight and obesity. *Prev Med* 2012; **55**(2): 102-107.
245. Naylor PJ, Bridgewater L, Purcell M, et al. Publically Funded Recreation Facilities: Obesogenic Environments for Children and Families? *Int J Environ Res Public Health* 2010; **7**(5): 2208-2221.
246. Naylor RW, Droms CM, Haws KL. Eating with a Purpose: Consumer Response to Functional Food Health Claims in Conflicting Versus Complementary Information Environments. *Journal of Public Policy & Marketing* 2009; **28**(2): 221-223.
247. Neckerman KM, Bader MDM, Richards CA, et al. Disparities in the Food Environments of New York City Public Schools. *Am J Prev Med* 2010; **39**(3): 195-202.
248. Nelson MC, Gordon-Larsen P, North KE, et al. Body Mass Index Gain, Fast Food, and Physical Activity: Effects of Shared Environments over Time. *Obesity* 2006; **14**(4): 701-709.
249. Nelson MC, Larson NI, Barr-Anderson D, et al. Disparities in Dietary Intake, Meal Patterning, and Home Food Environments Among Young Adult Nonstudents and 2- and 4-Year College Students. *Am J Public Health* 2009; **99**(7): 1216-1219.
250. Nelson MC, Story M. Food Environments in University Dorms: 20,000 Calories per Dorm Room and Counting. *Am J Prev Med* 2009; **36**(6): 523-526.
251. Nelson NM, Woods CB. Obesogenic environments: Are neighbourhood environments that limit physical activity obesogenic? *Health & Place* 2009; **15**(4): 917-924.
252. Nichol ME, Pickett W, Janssen I. Associations Between School Recreational Environments and Physical Activity. *J Sch Health* 2009; **79**(6): 247-254.
253. Nollen NL, Belfort CA, Snow P, et al. The school food environment and adolescent obesity: qualitative insights from high school principals and food service personnel. *International Journal of Behavioral Nutrition and Physical Activity* 2007; **4**: 18.
254. Norman GJ, Adams MA, Kerr J, et al. A Latent Profile Analysis of Neighborhood Recreation Environments in Relation to Adolescent Physical Activity, Sedentary Time, and Obesity. *J Public Health Management Practice* 2010; **16**(5): 411-419.
255. O'Kane G. What is the real cost of our food? Implications for the environment, society and public health nutrition. *Public Health Nutrition* 2012; **15**(2): 268-276.
256. O'Malley PM, Johnston LD, Delva J, et al. School Physical Activity Environment Related to Student Obesity and Activity: A National Study of Schools and Students. *J Adolesc Health* 2009; **45**(3): S71-S81.
257. Odaka Y, Nakano M, Tanaka T, et al. The Influence of a High-Fat Dietary Environment in the Fetal Period on Postnatal Metabolic and Immune Function. *Obesity* 2010; **18**(9): 1688-1694.
258. Olstad DL, Downs SM, Raine KD, et al. Improving children's nutrition environments: A survey of adoption and implementation of nutrition guidelines in recreational facilities. *BMC Public Health* 2011; **11**(1): 423.
259. Ordovás JM, Robertson R, Cléirigh EN. Gene–gene and gene–environment interactions defining lipid-related traits. *Curr Opin Lipidol* 2011; **22**(2) : 129-136.

260. Ordovas JM, Shen J. Gene-Environment Interactions and Susceptibility to Metabolic Syndrome and Other Chronic Diseases. *J Periodontol* 2008; **79**(8): 1508-1513.
261. Ordovas, JM. HDL Genetics: Candidate Genes, Genome Wide Scans and Gene-Environment Interactions. *Cardiovasc Drugs Ther* 2002; **16**(4): 273-281.
262. Oreskovic NM, Kuhlthau KA, Romm D, et al. Built Environment and Weight Disparities Among Children in High- and Low-Income Towns. *Academic Pediatrics* 2009; **9**(5): 315-421.
263. Oreskovic NM, Winickoff JP, Kuhlthau KA et al. Obesity and the Built Environment Among Massachusetts Children. *Clin Pediatr (Phila)* 2009; **48**(9): 904-912.
264. Osler M, Holst C, Prescott E, et al. Influence of genes and family environment on adult smoking behavior assessed in an adoption study. *Genet Epidemiol* 2001; **21**: 193-200.
265. Owen N, De Bourdeaudhuij I, Sugiyama T, et al. Bicycle Use for Transport in an Australian and a Belgian City: Associations with Built-Environment Attributes. *Journal of Urban Health* 2010; **87**(2): 189-198.
266. Ozdemir A, Yilmaz O. Assessment of outdoor school environments and physical activity in Ankara's primary schools. *Journal of Environmental Psychology* 2008; **28**(3): 287-300.
267. Pandalai SP, Schulte PA, Miller DB. Conceptual heuristic models of the interrelationships between obesity and the occupational environment. *Scan J Work Environ Health* 2013; **39**(3): 221-232.
268. Panter JR, Jones AP. Associations between physical activity, perceptions of the neighbourhood environment and access to facilities in an English city. *Soc Sci Med* 2008; **67**(11): 1917-1923.
269. Papas MA, Alberg AJ, Ewing R, et al. The Built Environment and Obesity. *Epidemiol Rev* 2007; **29**(1): 129-143.
270. Park S, Choi BY, Wang Y, et al. School and Neighborhood Nutrition Environment and Their Association With Students' Nutrition Behaviors and Weight Status in Seoul, South Korea. *J Adolesc Health* 2013; **53**(5): 655-662.
271. Park Y, Quinn J, Florez K, et al. Hispanic immigrant women's perspective on healthy foods and the New York City retail food environment: A mixed-method study. *Soc Sci Med* 2011; **73**(1): 13-21.
272. Pearce JR, Maddison R. Do enhancements to the urban built environment improve physical activity levels among socially disadvantaged populations? *International Journal for Equity in Health* 2011; **10**(1): 28.
273. Pendola R, Gen S. BMI, auto use, and the urban environment in San Francisco. *Health & Place* 2007; **13**(2): 551-556.
274. Peracchi F, Arcaleni E. Early-life environment, height and BMI of young men in Italy. *Economics and Human Biology* 2011; **9**(3): 251-264.
275. Phillips MM, Raczynski JM, West DS, et al. Changes in School Environments With Implementation of Arkansas Act 1220 of 2003. *Obesity* 2010; **18**(1): S54-S61.
276. Poortinga W. Perceptions of the environment, physical activity, and obesity. *Soc Sci Med* 2006; **63**(11): 2835-2846.
277. Poulain-Godefroy O, Froguel P. Preadipocyte response and impairment of differentiation in an inflammatory environment. *Biochem Biophys Res Commun* 2007; **356**(3): 662-667.

278. Powell LM, Han E, Zenk SN, et al. Field validation of secondary commercial data sources on the retail food outlet environment in the U.S. *Health & Place* 2011; **17**(5): 1122-1131.
279. Powell-Wiley TM, Ayers CR, De Lemos JA, et al. Relationship between perceptions about neighborhood environment and prevalent obesity: data from the Dallas heart study. *Obesity* 2013; **21**(1): E14-E21.
280. Power C, Jefferis BJMH. Fetal environment and subsequent obesity: a study of maternal smoking. *Int J Epidemiol* 2002; **31**(2): 413-419.
281. Prince SA, Kristjansson EA, Russell K, et al. A Multilevel Analysis of Neighbourhood Built and Social Environments and Adult Self-Reported Physical Activity and Body Mass Index in Ottawa, Canada. *Int J Environ Res Public Health* 2011; **8**(10): 3953-3978.
282. Procter KL, Clarke GP, Ransley JK, et al. Micro-level analysis of childhood obesity, diet, physical activity, residential socioeconomic and social capital variables: where are the obesogenic environments in Leeds? *Area* 2008; **40**(3): 323-340.
283. Rabin BA, Boehmer TK, Brownson RC. Cross-national comparison of environmental and policy correlates of obesity in Europe. *European Journal of Public Health* 2007; **17**: 53-61.
284. Rahman T, Cushing RA, Jackson RJ. Contributions of Built Environment to Childhood Obesity. *Mt Sinai J Med* 2011; **78**(1): 49-57.
285. Raja S, Yin L, Roemmich J, et al. Food Environment, Built Environment, and Women's BMI: Evidence from Erie County, New York. *Journal of Planning Education and Research* 2010; **29**(4): 444-460.
286. Regidor E, Gutiérrez-Fisac JL, Ronda E, et al. Impact of cumulative area-based adverse socioeconomic environment on body mass index and overweight. *J Epidemiol Community Health* 2008; **62**(3): 231-238.
287. Riva G. Virtual environments in clinical psychology. *Psychotherapy: Theory, Research, Practice, Training* 2003; **40**(1/2): 68-76.
288. Roefs A, Quaedackers L, Werrij MQ, et al. The environment influences whether high-fat foods are associated with palatable or with unhealthy. *Behav Res Ther* 2006; **44**(5): 715-736.
289. Roemmich JN, Epstein LH, Raja S, et al. The Neighborhood and Home Environments: Disparate Relationships With Physical Activity and Sedentary Behaviors in Youth. *Ann Behav Med* 2007; **33**(1): 29-38.
290. Roman CG, Knight CR, Chalfin A, et al. The Relation of the Perceived Environment to Fear, Physical Activity, and Health in Public Housing Developments: Evidence from Chicago. *J Public Health Policy* 2009; **30**(1): S286-S308.
291. Rose D, Hutchinson PL, Bodor JN, et al. Neighborhood Food Environments and Body Mass Index: The Importance of In-Store Contents. *Am J Prev Med* 2009; **37**(3): 214-219.
292. Rundle A, Neckerman KM, Freeman L, et al. Neighborhood Food Environment and Walkability Predict Obesity in New York City. *Environ Health Perspect* 2009; **117**(3): 442-447.
293. Rundle AG, Bader MDM, Richards CA, et al. Using Google Street View to Audit Neighborhood Environments. *Am J Prev Med* 2011; **40**(1): 94-100.

294. Rutt CD, Coleman KJ. Examining the relationships among built environment, physical activity, and body mass index in EL Paso, TX. *Prev Med* 2005; **40**(6): 831-841.
295. Saarloos D, Kim JE, Timmermans H. The Built Environment and Health: Introducing Individual Space-Time Behavior. *Int J Environ Res Public Health* 2009; **6**(6): 1724-1743.
296. Saben J, Lindsey F, Zhong Y, et al. Maternal obesity is associated with a lipotoxic placental environment. *Placenta* 2014; **35**(3): 171-177.
297. Saelens BE, Glanz K, Sallis JF, et al. Nutrition Environment Measures Study in Restaurants (NEMS-R). Development and Evaluation. *Am J Prev Med* 2007; **32**(4): 273-281.
298. Saelens BE, Sallis JF, Frank LD, et al. Neighborhood Environment and Psychosocial Correlates of Adults' Physical Activity. *Med Sci Sports Exerc* 2012; **44**(4): 637-646.
299. Saelens BE, Sallis JF, Frank LD, et al. Obesogenic Neighborhood Environments, Child and Parent Obesity: The Neighborhood Impact on Kids Study. *Am J Prev Med* 2012; **42**(5): e57-e64.
300. Sallis JF, Floyd MF, Rodríguez DA, et al. Role of Built Environments in Physical Activity, Obesity, and Cardiovascular Disease. *Circulation* 2012; **125**(5): 729-737.
301. Sallis JF, Glanz K. Physical Activity and Food Environments: Solutions to the Obesity Epidemic. *Milbank Q* 2009; **87**(1): 123-154.
302. Sallis JF, Glanz K. The Role of Built Environments in Physical Activity, Eating, and Obesity in Childhood. *Future Child* 2006; **16**(1): 89-108.
303. Sallis JF, Kerr J, Carlson JA, et al. Evaluating a Brief Self-Report Measure of Neighborhood Environments for Physical Activity Research and Surveillance: Physical Activity Neighborhood Environment Scale (PANES). *Journal of Physical Activity and Health* 2010; **7**: 533-540.
304. Sallis JF, Saelens BE, Frank LD, et al. Neighborhood built environment and income: Examining multiple health outcomes. *Soc Sci Med* 2009; **68**(7): 1285-1293.
305. Sallis JF, Slymen DJ, Conway TL, et al. Income disparities in perceived neighborhood built and social environment attributes. *Health & Place* 2011; **17**(6): 1274-1283.
306. Salmon J, Hume C, Ball K, et al. Individual, social and home environment determinants of change in children's television viewing: The Switch-Play intervention. *Journal of Science and Medicine in Sport* 2006; **9**(5): 378-387.
307. Salmon J, Timperio A, Telford A, et al. Association of Family Environment with Children's Television Viewing and with Low Level of Physical Activity. *Obes Res* 2005; **13**(11): 1939-1951.
308. Salois MJ. Obesity and diabetes, the built environment, and the 'local' food economy in the United States, 2007. *Economics and Human Biology* 2012; **10**(1): 35-42.
309. Salsberry PJ, Reagan PB. Effects of heritability, shared environment, and nonshared intrauterine conditions on child and adolescent BMI. *Obesity* 2010; **18**(9): 1775–1780.
310. Salsberry PJ, Reagan PB. Taking the long view: The prenatal environment and early adolescent overweight. *Res Nurs Health* 2007; **30**(3): 297-307.

311. Samimi A, Mohammadian AK, Madanizadeh S. Effects of transportation and built environment on general health and obesity. *Transportation Research Part D, Transport and environment* 2009; **14**(1): 67-71.
312. Santana P, Santos R, Nogueira H. The link between local environment and obesity: A multivelel analysis in the Lisbon Metropolitan Area, Portugal. *Soc Sci Med* 2009; **68**(4): 601-609.
313. Sarkar C, Gallacher J, Webster C, et al. Built environment configuration and change in body mass index: The Caerphilly Prospective Study (CaPS). *Health & Place* 2013; **19**: 33-44.
314. Schäfer Elinder L, Jansson M. Obesogenic environments – aspects on measurement and indicators. *Public Health Nutrition* 2009; **12**(3): 307-315.
315. Schmidt I. Metabolic diseases: The environment determines the odds, even for genes. *J Physiol* 2002; **17**(3): 115–21.
316. Schooling CM, Lam TH, Thomas GN, et al. Growth Environment and Sex Differences in Lipids, Body Shape and Diabetes Risk. *PLoS ONE* 2007; **2**(10): e1070.
317. Schulz LO, Bennett PH, Ravussin E, et al. Effects of Traditional and Western Environments on Prevalence of Type 2 Diabetes in Pima Indians in Mexico and the U.S. *Diabetes Care* 2006; **29**(8): 1866-1871.
318. Schwarte L, Samuels SE, Boyle M, et al. Local Public Health Departments in California: Changing Nutrition and Physical Activity Environments for Obesity Prevention. *J Public Health Management Practice* 2010; **16**(2): e17-e28.
319. Schwarte L, Samuels SE, Capitman J, et al. The Central California Regional Obesity Prevention Program: Changing Nutrition and Physical Activity Environments in California's Heartland. *Am J Public Health* 2010; **100**(11):2124-2128.
320. Schwartz BS, Stewart WF, Godby S, et al. Body Mass Index and the Built and Social Environments in Children and Adolescents Using Electronic Health Records. *Am J Prev Med* 2011; **41**(4): e17-e28.
321. Scott MM, Dubowitz T, Cohen DA. Regional differences in walking frequency and BMI: What role does the built environment play for Blacks and Whites? *Health & Place* 2009; **15**(3): 897-902.
322. Seliske LM, Pickett W, Boyce WF, et al. Association between the food retail environment surrounding schools and overweight in Canadian youth. *Public Health Nutrition* 2009; **12**(9): 1384-1391.
323. Sharkey JR, Horel S. Neighborhood socioeconomic deprivation and minority composition are associated with better potential spatial access to the ground-truthed food environment in a large rural area. *J Nutr* 2008; **138**(3): 620-627.
324. Shier V, An R, Sturm R. Is there a robust relationship between neighbourhood food environment and childhood obesity in the USA? *Public Health* 2012; **126**(9): 723-730.
325. Shill J, Mavoa H, Allender S, et al. Government regulation to promote healthy food environments – a view from inside state governments. *Obesity Reviews* 2012; **13**: 162-173.
326. Shimotsu ST, French SA, Gerlach AR, et al. Worksite environment physical activity and healthy food choices: measurement of the worksite food and physical activity environment at four metropolitan bus garages. *International Journal of Behavioral Nutrition and Physical Activity* 2007; **4**(1):17.

327. Shuldiner AR. Obesity Genes and Gene–Environment–Behavior Interactions: Recommendations for a Way Forward. *Obesity* 2008; **16**(3): S79-S81.
328. Sigman-Grant M, Christiansen E, Fernandez G, et al. Child care provider training and a supportive feeding environment in child care settings in 4 states, 2003. *Preventing Chronic Disease* 2011; **8**(5): A113.
329. Sigmundová D, Ansari WE, Sigmund E. Neighbourhood Environment Correlates of Physical Activity: A Study of Eight Czech Regional Towns. *Int J Environ Res Public Health* 2011; **8**(2): 341-357.
330. Singh GK, Siahpush M, Kogan MD. Neighborhood Socioeconomic Conditions, Built Environments, And Childhood Obesity. *Health Aff* 2010; **29**(3): 503-512.
331. Sirard JR, Laska MN, Patnode CD, et al. Adolescent physical activity and screen time: associations with the physical home environment. *International Journal of Behavioral Nutrition and Physical Activity* 2010; **7**(1): 82.
332. Sirard JR, Nelson MC, Pereira MA, et al. Validity and reliability of a home environment inventory for physical activity and media equipment. *International Journal of Behavioral Nutrition and Physical Activity* 2008; **5**(1): 24.
333. Skala K, Chuang RJ, Evans E, et al. Ethnic Differences in the Home Food Environment and Parental Food Practices Among Families of Low-Income Hispanic and African-American Preschoolers. *J Immigrant Minority Health* 2012; **14**(6): 1014-1022.
334. Skidmore P, Welch A, Van Sluijs E, et al. Impact of neighbourhood food environment on food consumption in children aged 9–10 years in the UK SPEEDY (Sport, Physical Activity and Eating behaviour: Environmental Determinants in Young people) study. *Public Health Nutrition* 2010; **13**(7): 1022-1030.
335. Skidmore PML, Cassidy A, Swaminathan R. An obesogenic postnatal environment is more important than the fetal environment for the development of adult adiposity: a study of female twins. *Am J Clin Nutr* 2009; **90**(2): 401-406.
336. Sloane D, Nascimento L, Flynn G, et al. Assessing Resource Environments to Target Prevention Interventions in Community Chronic Disease Control. *J Health Care Poor Underserved* 2006; **17**(2): 146-158.
337. Sloane DC, Diamant AL, Lewis LB, et al. Improving the nutritional resource environment for healthy living through community-based participatory research. *J Gen Intern Med* 2003; **18**(7): 568-575.
338. Smith C, Butterfass J, Richards R. Environment influences food access and resulting shopping and dietary behaviors among homeless Minnesotans living in food deserts. *Agric Hum Values* 2010; **27**(2): 141-161.
339. Smith DM, Cummins S. Obese Cities: How Our Environment Shapes Overweight. *Geography Compass* 2009; **3**(1): 518-535.
340. Snowdon W, Lawrence M, Schultz J, et al. Evidence-informed process to identify policies that will promote a healthy food environment in the Pacific Islands. *Public Health Nutrition* 2010; **13**(6): 886-892.
341. Sobngwi E, Mbanya JC, Unwin NC, et al. Exposure over the life course to an urban environment and its relation with obesity, diabetes, and hypertension in rural and urban Cameroon. *Int J Epidemiol* 2004; **33**(4): 769-776.

342. Solovieva S, Lohiniva J, Leino-Arjas P, et al. COL9A3 Gene Polymorphism and Obesity in Intervertebral Disc Degeneration of the Lumbar Spine: Evidence of Gene-Environment Interaction. *Spine* 2002; **27**(23): 2691-2696.
343. Speakman JR, Levitsky DA, Allison DB, et al. Set points, settling points and some alternative models: theoretical options to understand how genes and environments combine to regulate body adiposity. *Disease Models & Mechanisms* 2011; **4**(6): 733-745.
344. Spence JC, Cutumisu N, Edwards J, et al. Relation between local food environments and obesity among adults. *BMC Public Health* 2009; **9**: 192.
345. Spencer SJ. Early Life Programming of Obesity: The Impact of the Perinatal Environment on the Development of Obesity and Metabolic Dysfunction in the Offspring. *Current Diabetes Reviews* 2012; **8**(1): 55-68.
346. Spurrier NJ, Magarey AA, Golley R, et al. Relationships between the home environment and physical activity and dietary patterns of preschool children: a cross-sectional study. *International Journal of Behavioral Nutrition and Physical Activity* 2008; **5**(1): 31.
347. Stark JH, Neckerman K, Lovasi GS, et al. Neighbourhood food environments and body mass index among New York City adults. *J Epidemiol Community Health* 2013; **67**(9): 736–742.
348. Story M, Giles-Corti B, Yaroch AL, et al. Work Group IV: Future Directions for Measures of the Food and Physical Activity Environments. *Am J Prev Med* 2009; **36**(4): S182-S188.
349. Story M, Kaphingst KM, Robinson-O'Brien R, et al. Creating healthy food and eating environments: policy and environmental approaches. *Annual Review of Public Health* 2008; **29**: 253-72.
350. Story M, Nanney MS, Schwartz MB. Schools and Obesity Prevention: Creating School Environments and Policies to Promote Healthy Eating and Physical Activity. *Milbank Q* 2009; **87**(1): 71-100.
351. Stroebe W, Papies EK, Aarts H. From Homeostatic to Hedonic Theories of Eating: Self-Regulatory Failure in Food-Rich Environments. *Applied Psychology* 2008; **57**(S1): 172-193.
352. Sturm R. Disparities in the food environment surrounding US middle and high schools. *Public Health* 2008; **122**(7): 681-690.
353. Su S, Lampert R, Forrester L, et al. Common Genes Contribute to Depressive Symptoms and Heart Rate Variability: The Twins Heart Study. *Twin Research and Human Genetics* 2010; **13**(1): 1-9.
354. Suglia SF, Chambers EC, Rosario A, et al. Asthma and Obesity in Three-Year-Old Urban Children: Role of Sex and Home Environment. *J Pediatr* 2011; **159**(1): 14-20.
355. Swinburn BA, Sacks G, Hall KD. et al. The global obesity pandemic: shaped by global drivers and local environments. *Lancet* 2011; **378**: 804-14.
356. Symonds ME, Sebert S, Budge H. The Obesity Epidemic: From the Environment to Epigenetics – Not Simply a Response to Dietary Manipulation in a Thermoneutral Environment. *Frontiers in Genetics* 2011; **2**(24): 1-10.
357. Tamashiro KLK, Hegeman MA, Sakai RR. Chronic social stress in changing dietary environment. *Physiol Behav* 2006; **89**(4): 536-542.
358. Tamashiro KLK, Mortan TH. Perinatal environment and its influences on metabolic programming of offspring. *Physiol Behav* 2010; **100**(5): 560-566.

359. Tandon PS, Zhou C, Sallis JF, et al. Home environment relationships with children's physical activity, sedentary time, and screen time by socioeconomic status. *International Journal of Behavioral Nutrition and Physical Activity* 2012; **9**(1): 88.
360. Tanegashima K, Okamoto S, Nakayama Y. CXCL14 Deficiency in Mice Attenuates Obesity and Inhibits Feeding Behavior in a Novel Environment. *PLoS ONE* 2010; **5**(4): e10321.
361. Tappe KA, Glanz K, Sallis JF, et al. Children's physical activity and parents' perception of the neighborhood environment: neighborhood impact on kids study. *International Journal of Behavioral Nutrition and Physical Activity* 2013; **10**(1): 39.
362. Taylor AE, Sandeep MN, Janipalli CS, et al. Associations of FTO and MC4R Variants with Obesity Traits in Indians and the Role of Rural/Urban Environment as a Possible Effect Modifier. *Journal of Obesity* 2011; **2011**: 1-7.
363. Terry-McElrath YM, O'Malley PM, Delva J, et al. The School Food Environment and Student Body Mass Index and Food Consumption: 2004 to 2007 National Data. *J Adolesc Health* 2009; **45**(3): S45-S56.
364. Tester JM, Yen IH, Laraia B. Mobile Food Vending and the After-School Food Environment. *Am J Prev Med* 2010; **38**(1): 70-73.
365. Thompson AL. Developmental origins of obesity: Early feeding environments, infant growth, and the intestinal microbiome. *Am J Hum Biol* 2012; **24**(3): 350-360.
366. Timperio A, Ball K, Roberts R, et al. Children's fruit and vegetable intake: Associations with the neighbourhood food environment. *Prev Med* 2008; **46**(4): 331-335.
367. Timperio A, Ball K, Roberts R, et al. Children's takeaway and fast-food intakes: associations with the neighbourhood food environment. *Public Health Nutrition* 2009; **12**(10): 1960-1964.
368. Timperio A, Jeffery RW, Crawford D, et al. Neighbourhood physical activity environments and adiposity in children and mothers: a three-year longitudinal study. *International Journal of Behavioral Nutrition and Physical Activity* 2010; **7**(1): 18.
369. Timperio A, Salmon J, Ball K, et al. Family physical activity and sedentary environments and weight change in children. *International Journal of Pediatric Obesity* 2008; **3**(3): 160-167.
370. Timperio A, Salmon J, Telford A, et al. Perceptions of local neighbourhood environments and their relationship to childhood overweight and obesity. *International Journal of Obesity* 2005; **29**(2): 170-175.
371. Tremblay A, Pérusse L, Bouchard C. Energy balance and body-weight stability: impact of gene-environment interactions. *Br J Nutr* 2004; **92**(1): S63-S66.
372. Truong K, Fernandes M, An R, et al. Measuring the physical food environment and its relationship with obesity: Evidence from California. *Public Health* 2010; **124**(2): 115-118.
373. Turner L, Chaloupka FJ. Slow progress in changing the school food environment: Nationally representative results from public and private elementary schools. *J Acad Nutr Diet* 2012; **112**(9): 1380–1389.

374. Ulijaszek SJ. Frameworks of population obesity and the use of cultural consensus modeling in the study of environments contributing to obesity. *Economics and Human Biology* 2007; **5**(3): 443-457.
375. Utter J, Scragg R, Schaaf D, et al. Relationships between frequency of family meals, BMI and nutritional aspects of the home food environment among New Zealand adolescents. *International Journal of Behavioral Nutrition and Physical Activity* 2008; **5**(1): 50.
376. Van der Horst K, Timperio A, Crawford D, et al. The School Food Environment: Associations with Adolescent Soft Drink and Snack Consumption. *Am J Prev Med* 2008; **35**(3): 217-223.
377. Van Zutphen M, Bell AC, Kremer PJ, et al. Association between the family environment and television viewing in Australian children. *J Paediatr Child Health* 2007; **43**(6): 458-463.
378. Vaughan CH, Rowland NE. Meal patterns of lean and leptin-deficient obese mice in a simulated foraging environment. *Physiol Behav* 2003; **79**(2): 275-279.
379. Veitch J, Timperio A, Crawford D, et al. Is the Neighbourhood Environment Associated with Sedentary Behaviour Outside of School Hours Among Children? *Ann Behav Med* 2011; **41**(3): 333-341.
380. Velez Edwards DR, Naj AC, Monda K, et al. Gene-environment interactions and obesity traits among postmenopausal African-American and Hispanic women in the Women's Health Initiative SHARe Study. *Hum Genet* 2013; **132**(3): 323-336.
381. Vickers MH, Breier BH, Mccarthy D, et al. Sedentary behavior during postnatal life is determined by the prenatal environment and exacerbated by postnatal hypercaloric nutrition. *Am J Physiol Regul Integr Comp Physiol* 2003; **285**(1): R271-R273.
382. Vickers MH, Ikenasio BA, Breier BH. Adult growth hormone treatment reduces hypertension and obesity induced by an adverse prenatal environment. *J Endocrinol* 2002; **175**(3): 615-623
383. Vieira E, Gomes J. A comparison of Scopus and Web of Science for a typical university. *J Scientometrics* 2009; **81**(2): 587–600.
384. Vuguin PM, Hartil K, Kruse M, et al. Shared Effects of Genetic and Intrauterine and Perinatal Environment on the Development of Metabolic Syndrome. *PloS ONE* 2013; **8**(5): e63021.
385. Walton M, Pearce J, Day P. Examining the interaction between food outlets and outdoor food advertisements with primary school food environments. *Health & Place* 2009; **15**(3): 841-848.
386. Wang MC, Cubbin C, Ahn D, et al. Changes in neighbourhood food store environment, food behaviour and body mass index, 1981–1990. *Public Health Nutrition* 2008; **11**(9): 963–970.
387. Wang MC, Kim S, Gonzalez AA, et al. Socioeconomic and food-related physical characteristics of the neighbourhood environment are associated with body mass index. *J Epidemiol Community Health* 2007; **61**(6): 491-498.
388. Ward D, Hales D, Haverly K, et al. An Instrument to Assess the Obesogenic Environment of Child Care Centers. *Am J Health Behav* 2008; **32**(4): 380-386.
389. Ward DS, Saunders R, Felton GM, et al. Implementation of a school environment intervention to increase physical activity in high school girls. *Health Education Research* 2006; **21**(6): 896-910.

390. Wardle J, Carnell S, Haworth CMA, et al. Evidence for a strong genetic influence on childhood adiposity despite the force of the obesogenic environment. *Am J Clin Nutr* 2008; **87**(2): 398-404.
391. Watkins AJ, Fleming TP. Blastocyst environment and its influence on offspring cardiovascular health: the heart of the matter. *J Anat* 2009; **215**: 52-59.
392. Watson NF, Harden KP, Buchwald D, et al. Sleep Duration and Body Mass Index in Twins: A Gene-Environment Interaction. *Sleep* 2012; **35**(5): 597-603.
393. Wells NM, Ashdown SP, Davies EHS, et al. Environment, Design, and Obesity: Opportunities for Interdisciplinary Collaborative Research. *Environment and Behaviour* 2007; **39**(1): 6-33.
394. Wen M, Kowaleski-Jones L. The built environment and risk of obesity in the United States: Racial–ethnic disparities. *Health & Place* 2012; **18**(6): 1314-1322.
395. Widener MJ, Farber S, Neutens T, et al. Using urban commuting data to calculate a spatiotemporal accessibility measure for food environment studies. *Health & Place* 2013; **21**: 1-9.
396. Wilkin TJ, Mallam KM, Metcalf BS, et al. Variation in physical activity lies with the child, not his environment: evidence for an 'activitystat' in young children (EarlyBird 16). *International Journal of Obesity* 2006; **30**(7): 1050-1055.
397. Williams AJ, Wyatt KM, Hurst AJ, et al. A systematic review of associations between the primary school built environment and childhood overweight and obesity. *Health & Place* 2012; **18**(3): 504-514.
398. Williams J, Scarborough P, Matthews A, et al. A systematic review of the influence of the retail food environment around schools on obesity-related outcomes. *Obesity Reviews* 2014; **15**(5): 359-374.
399. Wilson A, Renzaho AMN, McCabe M, et al. Towards understanding the new food environment for refugees from the Horn of Africa in Australia. *Health & Place* 2010; **16**(5): 969-976.
400. Wilson AM, Magarey AM, Mastersson N. Reliability and relative validity of a child nutrition questionnaire to simultaneously assess dietary patterns associated with positive energy balance and food behaviours, attitudes, knowledge and environments associated with healthy eating. *International Journal of Behavioral Nutrition and Physical Activity* 2008; **5**(1): 5.
401. Wilson JS, Kelly CM, Schootman M, et al. Assessing the Built Environment Using Omnidirectional Imagery. *Am J Prev Med* 2012; **42**(2): 193-199.
402. Winson A. School food environments and the obesity issue: content, structural determinants, and agency in Canadian high schools. *Agric Hum Values* 2008; **25**(4): 499-511.
403. Winters M, Brauer M, Setton EM, et al. Built Environment Influences on Healthy Transportation Choices: Bicycling versus Driving. *Journal of Urban Health* 2010; **87**(6): 969-993.
404. Wisniewski AB, Chernausek SD. Gender in childhood obesity: Family environment, hormones, and genes. *Gend Med* 2009; **6**(1): 76-85.
405. Witten K, Blakely T, Bagheri N, et al. Neighborhood Built Environment and Transport and Leisure Physical Activity: Findings Using Objective Exposure and Outcome Measures in New Zealand. *EHP* 2012; **120**(7): 971-977.
406. Wordell D, Daratha K, Mandal B, et al. Changes in a Middle School Food Environment Affect Food Behavior and Food Choices. *J Acad Nutr Diet* 2012; **112**(1): 137-141.

407. Wyse R, Campbell E, Nathan N, et al. Associations between characteristics of the home food environment and fruit and vegetable intake in preschool children: A cross-sectional study. *BMC Public Health* 2011; **11**: 938.
408. Young DR, Felton GM, Grieser M, et al. Policies and Opportunities for Physical Activity in Middle School Environments. *J Sch Health* 2007; **77**(1): 41-47.
409. Yousefian A, Hennessy E, Umstattd MR, et al. Development of the rural active living assessment tools: Measuring rural environments. *Prev Med* 2010; **50**(1): S86-S92.
410. Zachary DA, Palmer AM, Beckham SW, et al. A framework for understanding grocery purchasing in a low-income urban environment. *J Qual Health Res* 2013; **23**(5): 665–678.
411. Zeller MH, Reiter-Purtill J, Modi AC, et al. Controlled Study of Critical Parent and Family Factors in the Obesigenic Environment. *Obesity* 2007; **15**(1): 126-136.
412. Zenk SN, Schulz AJ, Matthews SA, et al. Activity space environment and dietary and physical activity behaviors: A pilot study. *Health & Place* 2011; **17**(5): 1150-1161.
413. Zick CD, Hanson H, Fan JX, et al. Re-visiting the relationship between neighbourhood environment and BMI: an instrumental variables approach to correcting for residential selection bias. *International Journal of Behavioral Nutrition and Physical Activity* 2013; **10**(1): 27.
414. Zick CD, Smith KR, Fan JX, et al. Running to the Store? The relationship between neighborhood environments and the risk of obesity. *Soc Sci Med* 2009; **69**(10): 1493-1500.