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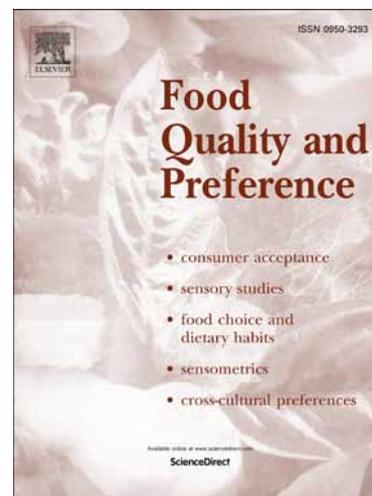
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Behind the Kitchen Door: A novel mixed method approach for exploring the food provisioning practices of the older consumer

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Abstract:

Social Practice Theory offers a theoretical approach to understanding habitual, mundane and tacitly enacted practices that are performed within the domestic environment. To support the practical adoption of this theory, this paper reports and reflects upon a methodological application of Social Practice Theory which was used to investigate the domestic kitchen-based practices of older adults (aged 60+) in order to understand the role of food safety within the everyday performance of these. Social Practice Theory requires a research design that situates data generation techniques into the 'space' in which the practices are performed and gives equal investigative consideration to the physical and social spheres of practices. We demonstrate that these methodological principles necessitate the use of mixed methods, and this case study presents a 'tool-kit' of data generation techniques that produced visual, verbal, textual, technical and scientific data. Through the presentation of results at the level of the individual household, the case study demonstrates how the different data streams acted as analytical lenses which facilitated data corroboration and comparison, and provided the basis for a grounded conceptual elaboration of domestically

situated food provisioning and handling practices and the role of food safety within these.

Key words:

Social Practice Theory, domestic kitchen practices, older consumers, mixed-methods, observation, visual methods, activity recognition.

ACCEPTED MANUSCRIPT

Introduction

Foodborne disease is a global health and food safety concern (Byrd-Bredbenner *et al.*, 2013; Redmond and Griffith, 2009) and potentially preventable if best practice food safety recommendations are followed (Jacob, Mathiasen and Powell, 2010; Mullan, Wong and O'Moore, 2010; and Fischer and De Vries, 2008). In the UK, it is estimated that annually 1 million people suffer illness as a result of foodborne disease (Food Standards Agency, 2012) and expert consensus suggests that the domestic setting is where most cases occur (FAO/WHO, 2002 in Redmond and Griffith, 2003; Byrd-Bredbenner *et al.*, 2013). Despite this, empirical evidence suggests that people do not consider their domestic kitchen or food handling practices to be particularly 'risky', often attributing blame for foodborne illness to the practices of others in the food chain (Byrd-Bredbenner *et al.*, 2013; Kennedy, *et al.* 2005; Bruhn and Schutz, 1999). However, the high annual economic costs attributed to foodborne illness, estimated at £1.9 billion in the UK (Food Standards Agency, 2012), has prompted the funding of research programmes aimed at understanding peoples' attitudes and behaviours towards domestic food safety (Novella, 2016; Wills *et al.*, 2013; Kendall, 2013; O'Connell, 2012; Brennan, McCarthy and Ritson, 2007).

For social scientists, studies of domestic food safety have typically been approached from two distinct disciplinary and epistemological perspectives. The first, a social psychological approach, has focused on the individual as a rational choice agent who is cognitively able to process best practice domestic food safety guidelines and make safe domestic food handling decisions in line with these (Mullan and Wong, 2010; Brennan, 2011; Kennedy *et al.*, 2011, Fischer *et al.*, 2007; Redmond *et al.*, 2004). Within this established approach, individuals' knowledge of and attitudes towards food safety have been examined using structured questionnaires or task-oriented observations held in experimental or real world conditions, during which actual food handling practices are compared with 'best practice' guidelines (see for example Milne, 2011; Kennedy *et al.* 2011; Fischer and Frewer, 2008; Fischer and De Vries, 2008; Kennedy *et al.* 2005; Terpstra, *et al.* 2005; Redmond and Griffith, 2005 and

Griffith, Worsfold and Mitchell, 1998). However, the focus on the individual has been criticised for overlooking the complexity and multidimensional nature of domestic life and the pressures under which food provisioning practices are performed (Halkier and Jensen, 2011; Halkier *et al.*, 2011). This has led to calls for contextualising food provisioning practices within the complexity of everyday life rather than being analysed in isolation from them (Brennan, 2011; Meah, 2013; Byrd-Bredbenner *et al.*, 2013).

Within the past decade, an alternative approach to understanding domestic food safety practices has emerged from sociological theories of practice. Originating from Bourdieu's (1977; 1984) thesis relating to '*habitus*', which suggested that socially inscribed practices act as a '*practical logic*' around which peoples' daily lives ebb and flow, the ontology of this perspective is based on the premise that food provisioning practices are an embedded element of everyday life (Wills *et al.*, 2013; O'Connell, 2012; Milne, 2011; Brennan, 2011). Practices are habitual in nature, often mundane, tacitly enacted with little conscious thought, operating according to their practical logic and subject to improvisation rather than to a particular plan or strategy (Bourdieu, 1977, 1984; Swartz, 2002; O'Connell, 2012; Backett-Milburn *et al.* 2010; Brennan, 2011).

Practices as the focus of analysis have been defined as '*routinized types of behaviours which consist of several interconnected elements: bodily and mental activities; 'things' and their use; background understandings; know-how; emotional states; and motivational knowledge*' (Reckwitz, 2002). Although there is no 'unified' practice approach (Schatzki, 2001, p.2 cited in Hargreaves, 2011) definitions of practice typically include three interconnected elements characterised by Shove, Pantzar and Watson (2012, p.24) as: 1) *images*; 2) *skills*; and 3) *things*. '*Images*' are considered to be a '*submersed layer of information and understanding which informs everyday action*' (Strengers, 2009, p.8). This knowledge does not wholly belong to the individual rather to the practice that they carry. Taking the example of roasting a chicken to illustrate, the individual practitioner will check that it is ready to serve by drawing upon their practical knowledge, such as cutting into the flesh to

ensure that it is not raw, checking the colour of the juices, and/or using a temperature probe (as per best practice recommendations). This knowledge is not innate rather it is learned and accumulated through experience, education and socialization. '*Skills*' refer to a certain level of competency and know-how on the part of the practitioner which can vary considerably from one practitioner to another, such as the difference in cooking skills between the novice and professional chef. '*Things*' relate to the objects that facilitate the successful performance of practices. For example, food preparation requires the use of material objects such as ovens, hobs, chopping boards, vegetable peelers and paring knives. All three of these elements are necessary to and embedded in the performance of a practice in order for the practice to be considered as an entity.

Therefore, from a theoretical perspective, practice theory offers a number of key contributions to the study of mundane aspects of everyday life. First, practice theory is unique in that it decentres analysis from the individual (Wills *et al.*, 2013; Hargreaves, 2011 and Strengers, 2009), thereby enabling the collection of holistic accounts of practices by encouraging the researcher to consider both the '*doings*' and '*sayings*' of practice which supports analysis that is '*concerned with both practical activity and its representations*' (Warde, 2005). Second, the ontology of 'interconnectedness' that underpins social practice theory encourages the researcher to open-mindedly observe all kitchen activities rather than breaking them down into pre-defined tasks such as shopping, cooking or cleaning (Wills *et al.*, 2013; Milne, 2011 and Halkier and Jensen, 2011). Third, social practice theory permits data analysis through a range of analytical lenses, by building up layers of understanding that contribute to providing a '*fuller picture*' of everyday life and an appreciation of the nuances and complexities embedded within (O'Connell, 2012; Brennan, 2011).

These advantages of practice theory have prompted what Domaneschi (2012) terms '*the practice turn in food studies*' which has been applied to studies of shopping (Everts and Jackson, 2009), cooking (Meah and Watson, 2011), domestic food waste (Evans, 2012), nutrition (Halkier and Jensen, 2011), food storage (Hand *and Shove*,

2007) and food safety (Wills *et al.*, 2013; Meah, 2013 and Milne, 2011). However, although the conceptual approaches to 'problematizing' a practice are well developed within the literature, empirical examples that describe and evaluate the data collection and analytical process are limited. Therefore the purpose of this paper is to explain how Social Practice Theory was implemented in a grounded theory study of domestic food-related practices of older consumers (aged 60+) and to understand the role of food safety within these.

The analysis begins by: explaining the theoretical sampling; identifying the research design framework; justifying the methodological toolkit that was used to generate data; describing the analytical approach at the level of the household; and discussing and reflecting on the research process.

The Sample

The kitchen practices of older adults (aged 60+) provided the empirical focus of the study due to: 1) epidemiological evidence of older adults' susceptibility to foodborne illness (and in particular *Listeria Monocytogenes (L. mono)*); and 2) the absence of empirical evidence of the domestic food handling practices of this cohort (Advisory Committee on the Microbiological Safety of Food, 2009; Social Science Research Committee, 2009). Data were collected from 10 households where at least one of the primary occupants was aged 60 or over. The households were purposely sampled from prior quantitative research undertaken in the North East of England which had segmented the over 60s cohort according to their propensity to engage with low, medium and high risk domestic food safety practices (Kendall *et al.*, 2012). As shown in the sample profile in Table 1, the households were represented by a range of; ages (63-92); gender (n=6 females, and n=4 males); marital status (n=2 married; n=3 single; n=4 widowed; n=1 divorced), living arrangements (n=8 lone householders, and n=2 co-habiting; and food safety behaviours. These behaviours derived from Kendall *et al.*, (2012) included: n=1 '*independent self-assessor*' defined as actively engaged with food provisioning and reliant on sensory evaluations to judge food safety; n=6 '*experienced dismissers*' defined as deferring to personal experience in judging the safety of food and rationalising the effort expended in

buying and preparing food; and n=3 '*compliant minimalists*' who adhered to food safety cues such as best before dates and sometimes required physical assistance in buying and preparing foods. This sample although diverse, included only older people who were living independently (or with limited assistance) in their own homes which included retaining some responsibility for acquiring, storing, preparing and cooking their own food, and clearing up after these activities. Households in care homes were not included due to their limited involvement with the wider food provisioning process. Data collection ceased at 10 households, when theoretical saturation (Glaser and Strauss, 1967) was achieved. This was determined when limited new information was generated and analytical concepts were substantiated through existing data (Charmaz, 2006). To be consistent with the practice theory ethos of decentring the individual, the term 'household' is intentionally used throughout the analysis to refer to the holistic 'practice environment' that includes the social and physical spheres of the 'practice practitioners'.

INSERT TABLE ONE HERE.

A Social Practice Theory Lens on the Food Provisioning Practices of the older adult

The framework used to inform the research design was developed around four areas of inquiry:

- i) What the older adults 'say' that they do in their kitchen;
- ii) What the older adults 'actually' do in their kitchen;
- iii) How does the kitchen itself, the way it is designed and the resources that are contained within it affect kitchen practices; and
- iv) What indicators of food safety can be used to explore the role of food safety within kitchen based practices.

Areas 1-3 were based on Shove, Pantzar, and Watson (2012) components of practice (*images, skills, things*); and area 4 was related to our food safety focus. As may be inferred from the list of questions above, there is no single method capable of addressing all three aspects of practices and food safety relating to chilling, cooking, cleaning and cross-contamination. Thus a research design that combined multiple

data generation techniques was required. The selection of methods also needed to avoid mentally and physically fatiguing the households, thereby safeguarding their volunteering in and/or completion of the study. Therefore, consultation on the mix of methods and duration of the study was sought from a range of relevant stakeholders¹. The result was a blend of data generation techniques that were used over a 4 week period. Ethical approval for the research design was sought and granted from Newcastle University's Faculty of Science, Agriculture and Engineering Ethics Committee. The data collection process was piloted with one household in September 2012, and the main data collection phase occurred during November 2012 to April 2013. Each participating household was remunerated with £80 of high street shopping vouchers on completion of the study.

The methodological 'Tool-Kit'

A mixture of methods or 'tool-kit' was designed to address the practice-based questions and food safety interests of this study. Although some of the methods are familiar to the social sciences, other data needs meant we sought data generation solutions from other disciplines. Individually the methods were not innovative; however, both their combination and use in domestic food safety research was novel. The interdisciplinary data generation techniques were both a necessity and implicitly avoided the methodological pitfall of privileging one data generation method (Atkinson and Coffey, 2011). We were also mindful that the selected methods should add something to our understanding of food safety within kitchen based practices (O'Connell, 2012) and should not be employed for their own sake (Sweetman, 2009). We used these two criteria of 'contribution' and 'usefulness' when reflecting on the research process. Table 2 summarises the methods used and the empirical justification for their inclusion. The methods are now discussed in the chronological order in which they were implemented. As part of the informed consent process all participants were made aware of the data collection activities

¹ Consultation in the design stages of the research was sought from the Institute for Ageing and Health at Newcastle University, The Elders Council North East and Voice North. Practical methodological and analytical advice was also sought from The Digital Interaction Group, Newcastle University.

that would be undertaken during the research, however, they were not made aware of the order in which activities were to be conducted in order to avoid biases becoming manifest. In total there were a minimum of four points of interaction with the households all of which provided interview opportunities.

INSERT TABLE 2 HERE

Life-Course Interviews:

In order to contextualise the households' domestic situation, the data generation process began with a life course interview with each member of the household. Life-course interviews encourage households to verbalise personal accounts of their lifestyle, present their own meanings and understandings of their relationships with food, identify triggers and points of transition during their life that may have resulted in a change to their relationship and practices with food (Devine, 2005; Sobal and Bisogni, 2009; Wills *et al.*, 2008 and Falk, *Sobal and Bisogni.*, 1996). In the two households with co-habiting members (HH1 and HH10), separate life-course interviews were conducted with all household members to avoid 'group think' (Janis, 1971) and capture the individual perspectives from all those involved in food provisioning and handling within the home. The interviews helped to establish rapport between the households and the researcher, and acted as a bridge into the private world of the household kitchen, providing a basis upon which further data streams could be layered, compared and contradictions explored. Each interview lasted approximately one hour, was digitally recorded and transcribed verbatim for analysis.

The 'Kitchen Go-Along':

The life-course interview provided a route into the second data generation technique, the 'kitchen go-along' which transferred control of the data generation to the household and was intended to enrich the insights gained within the interview(s). The 'go-along' is a participant-led activity in which the researcher accompanies their participants in their own familiar environments, in this instance the kitchen (Carpiano, 2009; Kusenbach, 2003). The central premise of this approach is to understand how *'individuals comprehend and engage with their*

physical and social environments in everyday life' (Kusenbach, 2003). Being participant-led reduces intrusion by giving participants autonomy over the process. In practice this meant that householders walked and talked the researcher through the design of the kitchen, enabling a physical demonstration of how the space was used, for example pointing out difficulties of bending into the vegetable draws at the bottom of under-counter refrigerators or reaching into high cupboards. Being *in situ* enabled the researcher to draw material objects both present or absent into the discussion, which in turn facilitated a practice-based dialogue of how food provisioning and handling was performed within the household. For example, a physical gap in the run of kitchen cupboards (HH2) was identified by the household as the space where a cooker previously stood, and prompted the researcher to ask the household about alternative cooking facilities. The explanatory nature of this method illuminated aspects of the mundane and households were able to use their bodies to demonstrate rather than merely describe (Leder Mackley *et al.*, 2013) which helped participants' recollection and verbalisation of their everyday practices (Sweetman, 2009; Power, 2003). This process began to build a picture of both 'what' and 'how' kitchen practices were performed and the objects used to facilitate these. During this process, photographs were taken, maps drawn (including measurements) of each household's kitchen and audio recordings of the discussions made. Immediately after, the researcher wrote up extensive field notes. The maps were later used to help explanations in subsequent interviews, particularly with households who had mobility restrictions as well as acting as an aide memoir for the researcher during analysis.

Refrigerator Audit:

The domestic refrigerator is recognised as fundamental to the safe storage of chilled food and is considered an essential appliance in best practice domestic food safety guidelines (Brennan *et al.*, 2013). As a key storage location for foods that act as the carriers of foodborne pathogens (particularly those classed as at high risk from *L. mono*) (Kennedy *et al.* 2011; Advisory Committee on the Microbiological Safety of Food, 2009; James, Evans and James, 2007; Kennedy *et al.* 2005; Redmond *et al.* 2004, Farber, Ross and Harwig., 1996; Farber and Peterkin, 1991) and as an

appliance owned by almost all UK households, the refrigerator was selected as a primary site for analysis. Although existing food safety research has previously considered the role of the domestic refrigerator, it has focused primarily on attempting to record internal refrigerators temperatures (James, Evans and James, 2007; Hudson and Hartwell, 2002 and Johnson *et al.*, 1998) the condition of the refrigerator including age, model and the presence of an integrated temperature monitoring facility (Haysom and Sharp, 2005). Although these factors were of interest to this study, it was also important to understand how households used their refrigerator and how they interacted with it. Therefore, three main data generation techniques were used in the refrigerator audit. First, an inventory of refrigerator contents was undertaken to record: the types of food and particularly 'high risk' Listeria foods² stored within the refrigerator; their packaging (i.e., original, modified or fully replaced packaging); use-by dates (UBD); and placement of food within the refrigerator. Although households were encouraged to assist in the completion of the refrigerator audit, which is consistent with a practice-based approach, this was not a requirement. In subsequent household visits, visual observations and photographs were taken to track changes in the refrigerator content and the positioning of food over the data collection period. Second, microbiological sampling was also conducted as part of the refrigerator audit to provide objective data to complement the narrative and visual data streams, thereby building up a rich and detailed picture of the hidden and/or invisible condition of each refrigerator and its ability to support the growth of *L. mono* (see for example, Kennedy *et al.*, 2011; Fischer *et al.*, 2007; Jackson *et al.*, 2007; Kennedy *et al.*, 2005; Redmond *et al.*, 2004). Microbiological testing in the domestic environment is consistent with approaches adopted by studies taking a HACCP informed approach to understand domestic food safety (Evans, *et al.*, 2012; Kennedy *et al.*, 2011; Fischer *et al.*, 2007; Jackson *et al.*, 2007; Kennedy *et al.*, 2005; Redmond *et al.*, 2004). Although, it is recognised that establishing direct causal associations between household practices and the microbiological results gained is

² High-risk Listeria products are typically chilled ready to eat (RTE) foods such as soft-cheese, pre-cooked meats, Pate, bagged salad, pre-prepared sandwiches and pre-cut fruit (ACMSF, 2009; Farber and Peterkin, 1991).

not possible, *Listeria* is a known environmental pathogen and the detection of any *Listeria* spp. could be indicative of an environment that could be supportive of the growth of *L. mono*.

Samples were taken from pre-defined kitchen locations identified as key to the survival and growth of *Listeria* spp., including: the sink plughole and overflow; and refrigerator drain, handle, and salad/meat/vegetable drawers (Haysom and Sharp, 2005; Hilton and Austin, 2000; Farber and Peterkin, 1991). At this stage in the research, respondent bias through prior cleaning of the refrigerator and self-auditing of the contents by discarding out-of-date food and non-participation were potential risks. Through both observation (a clean refrigerator which deteriorated in cleanliness over the 4 week research period) and discussions with the householders, it was identified that only one household's refrigerator was cleaned prior to an audit (HH10). These discussions also presented opportunities for exploring domestic refrigerator maintenance routines including the frequency of refrigerator cleaning.

The third part of the refrigerator audit involved understanding how households interacted with their refrigerators over an extended period of time to establish daily and weekly patterns of behaviour. Typical ethnographic techniques would include first hand observations made by the researcher in the home or remote observation techniques using video-recording such as CCTV. Both data generation techniques have potential disadvantages of researcher intrusion and in the case of CCTV analysis, analytical challenges (Martens, 2012). Therefore, alternative means of collecting longitudinal activity was required. Within the discipline of computer science (specifically Human Computing Interaction (HCI)) there has been increased interest in capturing and analysing social technical data simultaneously in kitchens (Brennan et al., 2013; Leder Mackley, *et al.*, 2013; Ploetz, *et al.*, 2011; Hammerla *et al.*, 2011; Brennan, 2011; Hoey *et al.*, 2010; Pham and Olivier, 2009; Olivier *et al.*, 2009). The tools have focused on the use of pervasive sensors and activity recognition (AR). Combined, these permit a more quantifiable picture of what kitchen activity is being performed and skill levels in food preparation to be assessed. Although the techniques and methodologies used in HCI are well

established, their application in domestic food safety research was novel, and thus this research provided an opportunity to test their feasibility. The justification for using AR sensors was their potential for providing a 'ground truth' of the usage patterns of key domestic sites/appliances³ (Olivier, *et al.*, 2009) without being intrusive to participants (Ploetz *et al.*, 2011). The small size of the sensors which are the size of a 50 pence piece, coupled with their relative inexpensiveness (Olivier, *et al.*, 2009) and potential for providing objective activity data in the kitchen further supported their inclusion in the study. For this research, the AR devices were reengineered to have the additional capacity to collect simultaneous activity and temperature data. These novel devices referred to as ARTs (activity recognition and temperature monitoring devices) were capable of capturing behavioural (timed usage patterns) and technical data (temperature readings) that supported a more quantifiable picture of what, and when, kitchen activity was being performed (Brennan *et al.*, 2013). All devices were installed using non-marking tape on household visit three, and remained in place capturing continuous data over a minimum 12 day period without the researcher being physically present.

The output of the ART analysis was a multi-stream, time-stamped data set from which refrigerator usage patterns, through the number of open and close events were identified. In addition, refrigerator temperature readings were taken, providing evidence of the operating temperature boundaries for each household's refrigerator (0-5°C is the recommended temperature range). On a more general level it was possible, using the AR data collected at the refrigerator and the other sites, to provide an overview of kitchen activity using appliance usage times as a proxy measure of peak usage times. In line with research conducted by Leder Mackley *et al.* (2013), the ART data provided a visual representation of household's movements within the kitchen. It provided a sense of daily routines within

³ Although AR techniques are not unique (research facilities world-wide are developing AR approaches), Newcastle Universities Culture Lab's Ambient Kitchen has pioneered the embedded use of these devices to understand kitchen practices. The devices used in this study were first generation AR(T)'s these devices were subsequently modified and building on the explorative work of this study 2nd generation devices were used within the Food Standards Agency ART feasibility study (see Brennan *et al.*, 2013; Brennan *et al.*, submitted).

households and a baseline upon which self-reported kitchen practices could be cross-referenced.

Food Purchase History:

Food acquisition was explored through food shopping receipts and cross referenced against data generated during the refrigerator audit process. Households were encouraged to retain their shopping receipts, for the first two weeks of the study to build up a food purchase history (Ransley *et al.* 2001). The analysis of these data focused on understanding the role played by and prominence of food purchasing, which was interpreted through the frequency of shopping trips, and the range of outlets used. Moreover the receipts identified the number and type of 'high-risk' Listeria products (chilled and RTE food products such as pâté, sliced meats, soft-cheese, pre-bagged salads and fruits) purchased and they were used as prompts for explanation within subsequent narrative interviews within the households. The data generated as part of the food purchase history gave an insight into the food purchasing routines of the households, the types of foods flowing through the households and the turnover rate of key food items known to be implicated in contraction of Listeriosis. Although research exploring food acquisition practices has included food purchase 'go-alongs' or accompanied shopping trips (Meah and Watson, 2011; Rayner, Boaz and Higginson, 2001) within this study the potential for participant fatigue meant that such accompanied shopping trips were deemed unsuitable. The collection of shopping receipts was considered less onerous to the household whilst providing a more longitudinal overview of food purchasing routines from which a practice based dialogue could be centred.

Video Documentation:

Finally, video documentation of between 1-4 meal preparation occasions was captured in nine of the ten households (one household (HH5) did not consent to be filmed but did permit a cooking observation session) enabling a deeper analysis into the sensory and material context of the households and subsequent discussion point in follow-up interviews (Martens, 2012; Sweetman, 2009; Power, 2003). Whilst interviews provided valuable self-reported insights into how food was handled and

prepared within the household, and the kitchen 'go-along' demonstrated how the kitchen space was negotiated, videoing household's preparing meal(s) permitted an intimate access into the food preparation practices of the households, where these practises were performed rather than merely described (Leder Mackley, *et al.*, 2013). Moreover, a physical demonstration of how the household routinely handled and prepared food provided a point of verification between the households 'sayings' (through self-reported accounts) and their 'doings' (through demonstration) of practice (Warde 2005).

Video data analysis, facilitated through continuous action capture, playback and slow motion, allows this method to go beyond what can be captured through static images, maps and journal notes and avoids information loss (Martens, 2012; Creswell, 2007). Although there are a number of ways to capture video footage the participant-led filming approach, as adopted by Marten's (2012) within her '*Domestic Kitchen Practices Study*', was applied. Video cameras were temporarily fitted and left for participants to turn on when they prepared their meals, thereby creating 'participant-produced' footage (Muir and Mason, 2012). This approach negated the necessity for the researcher to be present during filming which may have introduced bias by disrupting the flow of practices or influencing how meal preparation was performed. It also avoided the participants holding the video camera which could have presented a potential safety risk and/or induced fatigue.

Debriefing:

In line with ethical research practice, a debrief interview was conducted as a means of gaining frank participant responses about the research methods and the study protocols. Participants were de-briefed at the end of the data collection period to provide both the researcher and participant with the opportunity to reflect on the research process (Mason, 2002).

Analysis of Multiple Data Streams:

Table 3 identifies the total number of individual pieces of data collected within each household and across the sample, demonstrating the depth of the data collected at the household level and the breadth of insights across the sample.

INSERT TABLE 3 HERE

The lack of guidance on how practices should be investigated also extends to data analysis. In following the advice of Gibbs (2008) to design and apply an analysis framework that is consistent with the aims and objectives of the research, it was necessary to refer to the broader literature for analytical structure (Strengers, 2009). Whilst triangulation aims to integrate different data streams, the diversity of the data generated meant it was neither advisable nor desirable to attempt to triangulate it (Mason, 2006; Brannen, 2005). We therefore used a grounded theory approach (Glaser and Strauss, 1967) which focuses on comparative analysis, ultimately leading to an inductively derived 'core-concept' to explain domestic food practices of the older consumer (Charmaz, 2006; Spiggle, 1994; Glaser and Strauss, 1967). The data analysis was conducted in three stages (See Figure 1). The results reported here are at the first stage of analysis and are presented to illustrate the novel methodological approach and examine the role of the different evidence streams as a foundation for further comparative analysis between households (stage 2) and the identification of an overarching concept for the purpose of theory generation (stage 3).

INSERT FIGURE ONE

The first stage of the analysis was at the level of the household in order to understand the role of food within the household, the kitchen environment and how this shaped relationships with food, and the food provisioning and handling practices of the household. In this analytical phase, the data were open-coded and hypotheses about the relationships with the data were made, with evidence drawn from multiple data sources to either support (through corroboration or elaboration of the data) or refute (*via* contradiction) the relationship (Brannen, 2005). In addition practice-orientated

questions were asked and theoretical sampling from within all the data streams enabled the development of contextually grounded understandings of each household's practices.

The following stage 1 analysis is based upon a case study of 'household 2' 'Peter' (a pseudonym). Brannen's (2005) framework for evaluating mixed method research design provides the structure for this analysis which begins with a short biographical introduction to Peter constructed from the data generated during the life-course and subsequent interviews.

Stage 1 analysis: Household Analysis: 'Peter'

Peter is 70 years old; he is single and lives alone in his one bedroom ground floor flat that he rents from a local housing association and has resided in for the past five years. Peter is an only child and was brought up in the North East of England. As a child he and his family faced economic hardship resulting in what Peter considered to be a limited and simple diet that was restricted primarily by what could be afforded. Peter left school at the age of 15 to become an engineer apprentice in order to ease the economic pressures at home. At the age of 22 Peter joined the army and served for 22 years. Peter retired from the army in the 1980s and returned to the North East, he bought his first home where he lived with his mother until 2000s. Until his mother's death, Peter had never been required to engage in the household practices of shopping, cooking or cleaning. He now assumes the role of main food preparer in his home and receives assistance with cleaning weekly. Consistent with the role food has served across his life course, Peter views '*food as fuel*' with food playing primarily a functional role in his life.

Confirmatory and complimentary evidence

Understanding the meaning of food in the context of the different households within the sample was a central component of the research. Peter was identified as adopting a utilitarian approach to food and its preparation, which, consistent with the findings of Furst *et al.*, (1996), was influenced by formative childhood

experiences and his occupation. This was evidenced within the initial life-course interview when he reflected on his early memories of food:

'I came from a very poor family...life was pretty rough then...we ate just what all poor people ate... pretty basic stuff, there was nothing fancy.'

Routine and simplicity were identified as recurrent themes in this household and were confirmed through the various visual and verbal data streams and was evident upon entering the kitchen itself. Despite its moderate size, Peter's kitchen to his own admission was 'pared down' and 'functional'. The floor plan and photographs evidencing this practical but impersonal space are shown in Figure 2.

INSERT FIGURE TWO.

Peter's need for routine and simplicity were also supported by the data generated during the narrative interviews, the kitchen 'go-along', the food shopping receipts collected by Peter as well as the video documentation of his food preparation practices. In the narrative interview Peter explained:

'Routine gives me confidence; it makes me happy to know that when I wake up and get out of bed, I know what I'm doing for my full day'

In particular, the desire for simplicity was evidenced by the data collected from Peter's shopping receipts and the photographs he had taken of his own food procurement practices and the subsequent discussions that centred upon these data. The data showed that Peter conducted his shopping at the same time and place each week, purchasing the same 'basic' foods in line with what he had always eaten. Food was purchased locally as he explained:

'... if I go along the road to the local shop, nice little shop, simple, I can go and potter about, pick things up, put them in my bag get to the till and say I don't want that and put stuff back, it's much easier, it is much nicer'

Figure 3 illustrates the shopping list Peter prepared in advance of undertaking weekly food shopping, which he remarked ensured *'nothing's missed'*. Figure 4, a photograph taken by Peter of his weekly food shop on his return home, confirms the *'local'*, *'simple'* and pragmatic approach to food procurement discussed.

INSERT FIGURE THREE HERE

INSERT FIGURE FOUR HERE

Analysis of the kitchen space during the kitchen *'go-along'* revealed more about Peter's pragmatic approach to food. The food provisioning environment was shaped to accommodate the simplified approach, which included changes to the material contents of the kitchen, which had been *'pared down'* after downsizing to include only items that were necessary to Peter's food preparation practices. The most obvious of which, shown in Figure 5, was Peter's removal of his cooker which was replaced with a countertop two ring electric hob and a microwave, which supported his practice of *'heating stuff up'* rather than cooking from first principles. Further examples of this were evident when looking behind Peter's kitchen cupboards doors, which contained only two sets of crockery and utensils; he had gifted the redundant pieces which were *'surplus'* to his practices. Further evidence of this emerged from the analysis of the video data of Peter's cooking practices. Here it was revealed that Peter did not own a chopping board or oven gloves and these items were substituted with plates and his sink draining board for preparing raw food; his tea towel took on the multifunctional role of drying, wiping surfaces and handling hot items. Embedded within this substitution of key kitchen *'things'*, were notable food safety risks including the increased risk of cross contamination.

INSERT FIGURE FIVE HERE

Elaboration

Exploration of the kitchen during the *'go-along'* and particularly the refrigerator audit, revealed more about Peter's food procurement methods and whilst this

strengthened the notion of his practical approach to food preparation, it also highlighted that Peter had a more complex food procurement practices than he had portrayed in his interviews and was observed in his food purchase history. The refrigerator audit highlighted the strategy Peter adopted to lessen the burden of daily food preparation which was to accept regular *'gifted'* food items. Here Peter refers to this practice:

'I do okay in the food line from other people...I have three friends, who cook for me'

Figure 6 shows the un-dated gifted food items in Peter's refrigerator, which were not highlighted during the life-course interview or evident within the analysis of the household's food purchase history. Subsequent discussion with Peter about his receipt of gifted foods highlighted an exchange reciprocity in which he provided support with transportation and/or odd jobs to female friends in exchange for foods. This issue of gifted foods demonstrates the utility of layering understanding of practices through multiple data streams and the elaboration that can be achieved when combining insights from multiple perspectives.

INSERT FIGURE SIX HERE

Contradictory

Despite the utilitarian approach to food procurement and preparation, evidenced by both narrative and visual data streams, the technical data collected by the ART devices contributed a further valuable perspective into this household's food provision practices and the importance of using multiple data streams. Activity data revealed that the kitchen was consistently used over the data collection period between the hours of 3pm and 10pm. This suggested there was considerably more engagement with the space than had been verbally reported or that would have been evident from a visual inspection of the kitchen space. Deeper analysis of the narrative data highlighted Peter's habit of preparing his evening meal in advance earlier in the day, and his continuous *'snacking throughout the day'*, accounting for

the more prolonged usage of the kitchen and the lesser significance given to main meals and their preparation. His snacking habits were also supported by the data generated from Peter's shopping history (see Figure 3). The reduced significance of main meal preparation had contributed to the *'paring down'* of the *'things'* that would typically support food first principle food preparation. In addition video documentation and participant generated photographs showed that Peter adopted a time staggered approach to food preparation, which involved intensive use of the microwave through the sequential defrosting and heating of food items which were then assembled on a plate for the final re-heat before being eaten. This can be seen in participant photographs shown in Figure 7. This evidence was later presented to Peter in discussion, and it was reported that this approach allowed him to leave the kitchen during the food preparation process and facilitated his simultaneous engagement with more preferable activities such as reading the newspaper, listening to the radio or watching television whilst he waited for the microwave to *'ping'*.

INSERT FIGURE SEVEN HERE

Discussion: Methodological Reflections

Social practice theory has been identified as a theoretical framework, that through the consideration of *'images'*, *'skills'*, and *'things'* (Shove, Pantzar and Watson, 2012), permits the researcher to observe and understand a given practice in the context in which it is performed (Meah, 2013; Byrd-Bredbenner et al., 2013; Brennan, 2011). This paper argues that appreciating the complexity of kitchen life within which food provisioning and handling practices are routinely enacted, requires the adoption of multiple research methods that represent these three essential components of practice. Layered upon this was the specific interest in food safety that required the inclusion of supplementary data streams that sought to unpick the role of food safety within everyday food provisioning and handling. Adopting this multi-perspective approach resulted in the development of a methodological *'tool-kit'* that included traditional and novel interdisciplinary methods suitable for exploring and observing domestic food provisioning and

handling practices which challenged the researcher to think differently about the households and their kitchen practices. The suitability of mixed methods for addressing this research challenge resulted in what was considered an 'ethnographically inspired' research design. The appropriateness of this approach reinforced the requirement for any empirical application of social practice theory to be explored using ethnographic methods. The ethnographic hybrid approach adopted here was considered appropriate given the heterogeneity of the sample (Kendall *et al.*, 2012), the requirement to minimise participant fatigue and limit research intrusion in the home.

The ethnographically inspired approach and the 'tool-kit' of methods has a number of benefits. First, it permits the researcher to look behind the kitchen door and firmly locate primary data collection within the domestic kitchen, the physical space where food provisioning practices are routinely performed. Second, decentring the individual and centralising the performance of practice, allows the researcher to reveal how the kitchen environment, the resources contained within (*'things'*) and the individuals that use the space shape the practices that are performed within the setting. Broadening the focus away from the individual representations of practice in this way forces the researcher to avoid taking insights on face value and can be argued to offer a sensitive analysis of everyday practices. Third, this approach gave a voice to the *'things'* that are often overlooked but that are instrumental to the performance of kitchen practice that could not be accessed through the consideration of self-reported behaviours alone.

This examination of domestically situated practices has shown how a mixed methods research design can be used to gather an array of complementary data including visual, verbal, written, technical/scientific data streams, from which the complexities, and multi-dimensionality, of everyday kitchen life can be explored. The insights gained enabled the construction of detailed pictures of the food procurement, handling and cleaning practices of each of the individual households. Through the analytical processes of data corroboration, elaboration and/or contradiction (Brannen, 2005), the multiple data streams augmented one another

enabling a robust construction of the food provisioning practices of the older adult. Moreover, consistent with the grounded analytical approach, the sequential stages of data generation provided multiple points of contact with the households, allowing the researcher time to reflect on the data at each stage, thereby enabling opportunities for data elaboration and contradictions to be more fully and iteratively explored both conceptually and empirically (Chamaz, 2006; Glaser and Strauss, 1967).

Miles and Huberman (1994) argue that qualitative data analysis can be regarded as a continuum ranging from descriptive analysis at one end to full theoretical interpretation at the other. This study has shown that by using Social Practice Theory contributions can be made at each level along this continuum. The household case study presented here demonstrates descriptive analysis, upon which conceptual development, through constant comparison can be built facilitated by the ability to sample from within, and across, a diverse data set in order to build, reinforce and challenge theoretical insights.

Whilst the adoption of a SPT framework is celebrated for its capacity to facilitate access to action, the approach is not without its limitations. First, one must consider the research design and the extent to which each of the individual methods included within the 'tool kit' do provide an alternative lens through which to observe the same phenomena. Post hoc reflection of the research design highlighted the scientific data collected *via* microbiological sampling not to have contributed to the development of a '*fuller picture*' of household food provisioning practices (O'Connell, 2012). The rapport generated with the households during data collection meant that all householders were happy to consent to microbiological sampling, although it is acknowledged that such 'testing' may not ordinarily be suited to facilitating open researcher/participant relations. The microbiological sampling within this study was intended to assess the unseen condition of the refrigerators and the environmental potential to support the growth of *L. mono* at key sites within the kitchen. However, on reflection establishing the microbiological status of these sites in terms of *L. mono* did not necessarily mean that other harmful

pathogens were not present nor that *L. mono* was not present before or after the testing took place. Determining the absence of *L. mono* could be considered as only one measure of the success of a household's kitchen management practices and did not necessarily mean that the kitchen was 'safe' and/or 'free of' other potentially harmful pathogens. It is thus concluded that microbiological sampling is more suited to 'HACCP style' research studies and it is advised that future ethnographically inspired domestic kitchen practices research should reconsider the appropriateness and value of its inclusion.

Second, by placing the kitchen and the practices that are performed within this space at the centre of the analysis, there is a risk that the role played by other spaces in individual's food lives, are overlooked. This includes the role played by spaces both inside and outside of the home, for example the role of others' kitchens in the provision of 'gifted' food as highlighted by the case study of Peter, but could be extended to include places such as lunch clubs and restaurants.

Finally, from a practical perspective it must be acknowledged that engagement with the mixed methods reported here required extensive collaboration and engagement with different disciplinary teams and posed challenges in terms of developing working relationships with researchers from different ontological and epistemological traditions (Mason, 2006; Brannen, 2005). Moreover, as O'Connell (2012) reminds us, that the ability to work interdisciplinary requires experienced researchers, who have developed a range of methodological and analytical skills and can carry cost implications that must be considered in the research design process.

Conclusions

This research has illustrated the methodological implementation of a Social Practices Theory approach to explore the food provisioning and handling practices of older adults. It has challenged the overuse of self-reported methodologies through an innovative mixed methods approach. While the authors acknowledge that methodologically there is considerable scope for refining the methods used, what has been demonstrated is that the methods applied have helped: 1) build

complementary and contrasting layers of understanding of domestic kitchen life; 2) address the problems associated with an over reliance on self-reported data; 3) show how individually and collectively each method (and associated data stream) can contribute to our understanding of the complexity and multi-dimensionality of domestic food provisioning, and 4) provide a novel basis upon which future domestic-based, practice-inspired research can be built.

ACCEPTED MANUSCRIPT

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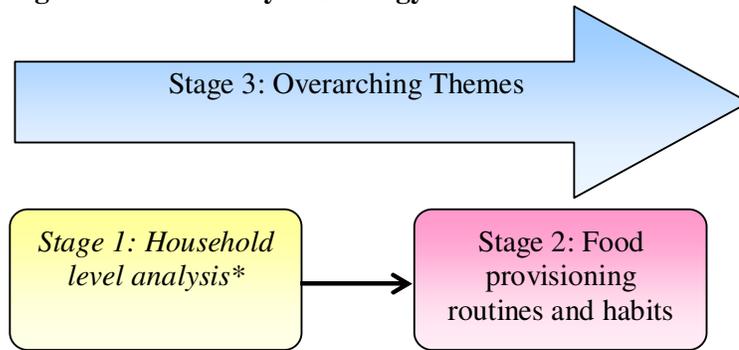
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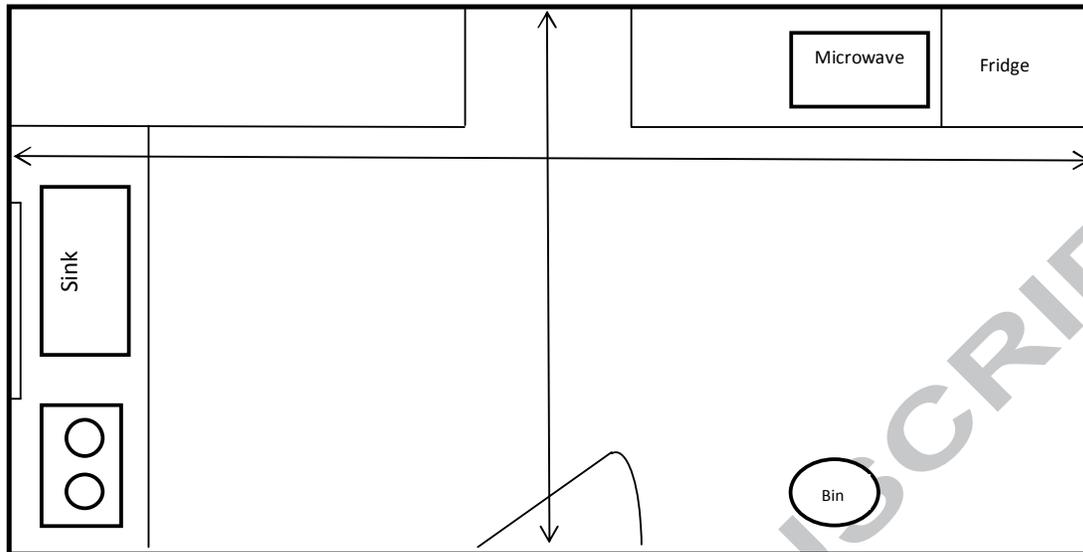
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Figure 1: Data Analysis Strategy

*Data presented from Stage 1: household level analysis.

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Figure 2: Peter: Kitchen Floor Plan*



*Not drawn to scale



Figure 3: Peter: Shopping List

Non-Supermarket “Big shop”

(1st December 2011)

2 packs of Stottie Cake segments (6)

6 – oranges

4 – Cox’s apples

6 – bananas(medium)

1 tub – raspberries.

1 tub – blueberries

1/2lb - loose fresh dates.

2 – chicken breasts

1 – pork steak

1 tub – pease pudding

4 slices – black pudding

Note – The dates, black pudding, blueberries and raspberries will be eaten as snacks.

The chicken breasts and pork steak will be cooked as part of a meal with vegetables and potatoes.

The Pease Pudding will be used with the Stottie Cakes segments to make sandwiches

The total cost was.....£16.14

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Figure 4: Peter: Weekly Food Shop



Figure 5: Peter: Kitchen Environment



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Figure 6: Peter: 'Gifted' Food Items



Figure 7: Peter: Time Staggered Food Preparation



Table 1: Sample Composition

Household (HH) no.	Assigned pseudonym	Age	Gender	Marital status	Living arrangements	Cluster membership
1	Joan	76	Female	Married	Cohabit	Experienced dismisser
2*	Peter	70	Male	Single	Live alone	Compliant minimalist
3	Gill	63	Female	Single	Live alone	Experienced dismisser
4	Sandra	68	Female	Divorced	Live alone	Experienced dismisser
5	Kathy	75	Female	Widowed	Live alone	Experienced dismisser
6	Annie	82	Female	Widowed	Live alone	Experienced dismisser
7	Jack	73	Male	Single	Live alone	Experienced dismisser
8	Burt	88	Male	Widowed	Live alone	Compliant minimalist
9	Martha	92	Female	Widowed	Live alone	Compliant minimalist
10	Evelyn	63	Female	Married	Cohabit/lodger	Independent self-assessor

*Case Study household

Table 2: Data Generation Methods

Technique	Reference	Application	Visit (weeks)	Images	Skills	Things
Interviewing (Life-course and In-depth)	Bertaux and Kohli (1984) Elder (1994) Humphrey (1993) Moen, Dempster-McClain and Williams (1995) Falk <i>et al.</i> , (1996)	Life-course interview as an introduction to the research informed by responses gained during P1. In-depth with focus specifically upon methods of food provisioning and cleaning.	1-3	✓	✓	
Kitchen 'go-along'	Carpiano (2009) Kusenbach (2003)	Participant-led tour of the kitchen, looking specifically at what is contained within the kitchen, looking behind the cupboard doors, who uses the kitchen. Other uses, modifications and positive and negative aspects of the kitchen space and its design.	2	✓	✓	✓
Kitchen architecture mapping** ¹	N/A	Kitchen floor plan and measurements.	2			✓
Food purchase history	Ransley <i>et al.</i> (2001) Ransley <i>et al.</i> (2003)	Collection of food shopping receipts for first two weeks of study, shopping routines, how frequently, where and what foods are purchased and why. <i>I.e. are high-risk listeria products and reduced price items purchased?</i>	3		✓	
Fridge audit **	N/A	Fridge condition, age, foods stored within the fridge, shelf positioning of products, use-by dates.	2		✓	✓
Microbiological sampling	Kennedy <i>et al.</i> , (2005) Kennedy <i>et al.</i> , (2010) Kennedy <i>et al.</i> , (2011) James, Evans and James (2007) Haysom and Sharp (2005) Redmond <i>et al.</i> , (2004)	Is <i>Listeria spp.</i> present in the fridge?	2		✓	✓
Activity recognition	Hoey <i>et al.</i> , (2011) Plotz, <i>et al.</i> , (2011) Hammerla <i>et al.</i> , (2011)	Unobtrusive observation of kitchen activity, kitchen peak usage times, fridge efficiency.	3		✓	✓

¹ ** data generation technique developed exclusively for the study

	Pham and Olivier, (2009) Oliver <i>et al.</i> , (2009)					
Visual documentation	Pink (2009) Gibson (2005) Rostvall and West (2005) O'Connell (2012) Sweetman (2009)	Photographic documentation widely used throughout the 4-week data collection, video documentation of meal occasions capturing the activity of food preparation.	2-4	✓	✓	✓
De-brief interview	Bertaux and Kohli (1981) Elder (1994) Humphrey (1993) Moen, Dempster-McClain and Williams (1992)	In-depth interview technique adopted, opportunity to gain participant reflections of partaking in the research. Share preliminary findings and elicit further insights based on the feedback of data collected (photographic, video and AR to conclude and de-brief.	5 <i>(Subsequent visit made 1 month after completion of data collection)</i>	✓	✓	✓

Table 3: Household Observation Data Summary (4 week period)

Households	Data Collection Methods							
	In-depth interview (s)	Fridge audit (inc. spot check)	Shopping receipts	Photos	Video	ART (fringe usage total open events 12 days)	ART (mean fridge temp 12 days)	Microbiological (samples)
HH1	4	4	21	92	3	79	7.59	4
HH2 (Peter)	4	4	3	68	2	141	2.67	4
HH3	4	4	11	84	1	97	0.61	3
HH4	3	4	17	75	2	102	13.46	3
HH5	3	4	4	83	-	190	2.87	3
HH6	3	4	5	53	1	144	5.43	3
HH7	3	4	3	61	1	109	1.64	3
HH8	3	4	6	79	3	144	2.09	3
HH9*	3	4	1	72	1	-	-	3
HH10	4	4	10	95	3	313	18.23	3
Total	34	40	81	762	16	-	-	32

*ART failed to record temperature for this HH

Highlights

- This paper reports and reflects upon a methodological application of Social Practice Theory (SPT) to explore the domestic kitchen-based practices of older adults (60+).
- It is argued that empirical practice based studies should be situated in the sphere in which practices are performed.
- In order to appreciate the multidimensional nature of kitchen life an ethnographic 'tool-kit' of methods is proposed.
- Adopting a 'tool-kit' of mixed methods' builds complementary and contrasting layers of understanding of domestic kitchen life,
- From which, it is argued that the role of food safety within households can be explored.

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