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*Fresh Street Unpacked: The Interaction of Nudges
in Driving Change*

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Abstract

Although public health campaigns promote the 5-a-day guideline as a matter of personal responsibility, structural and psychological barriers may undermine an individual's efforts to achieve it. These barriers contribute to an intention-behaviour gap, which is particularly evident within lower-income communities. Research suggests interventions employing nudge theory are often effective at increasing fruit and vegetable (FV) consumption, particularly when paired with a financial incentive.

This study analyses the effectiveness of Fresh Street, a food voucher scheme aimed at improving dietary quality within areas of high deprivation. Fresh Street presents a unique case study, and existing research on its operations is currently limited to its own publications. To address this research gap, a framework encompassing five core principles of nudge theory – financial incentives, default options, convenience, social norms, and framing – was devised to evaluate the scheme's effectiveness. While individual nudge concepts are widely researched, the combination of these offers a novel approach.

In-depth interviews were conducted with Fresh Street representatives, which provided unique managerial insights, offering a holistic understanding of operational dynamics and areas for improvement. The emergent themes were categorised and applied to the nudge framework.

The key drivers of initial behaviour change were identified as convenience, through increased access, and financial incentives, while enhanced food-related education and social connections may provide longer-term solutions. These results indicate that food voucher schemes are effective, but this integrative approach can help pinpoint areas of success for future interventions. This model not only offers a novel perspective but also lays the groundwork for extending its application to household-level analyses, providing critical insights into participant perceptions and behavioural outcomes.

Key words: Nudge Theory, Food Voucher Schemes, Fresh Street, Fruit and Vegetable (FV) Consumption, Psychological Barriers, Structural Barriers, Intention-Behaviour Gap, Financial Incentives, Convenience, Default Options, Social Norms, Framing, Food Accessibility

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1. Introduction

1.1 Research Context

The suboptimal consumption of fruit and vegetables (FV) poses a significant global challenge. The World Health Organization (WHO; 2020) recognises unhealthy diets as a prominent risk factor for non-communicable diseases. Conversely, diets high in FV have been shown to significantly reduce the prevalence of cardiovascular disease, cancer, diabetes, stroke and overall mortality (WHO, 2020).

This issue is especially pronounced in the UK, where only 29% of adults and 18% of children meet the 5-a-day requirement (NHS Digital, 2019). Income disparities exacerbate this gap, with the poorest 20% consuming one fewer portion of FV per day compared to the richest 20% (The Department for Environment, Food & Rural Affairs [DEFRA], 2024). In the UK, the past three years have seen consumer price inflation (CPI) outpace wage growth, with food inflation reaching a 45-year high (DEFRA, 2024). This economic pressure has driven the share of food-insecure households to rise 25% from the financial year ending 2022 to 2023 (DEFRA, 2024).

DEFRA's 2024 Food Security Report at the household level focuses on improving access, geographically and financially, to reduce food insecurity rates, particularly in lower-income communities (DEFRA, 2024). Two case studies are presented to address and facilitate an understanding of this issue. One of which is Fresh Street, the case explored in this dissertation. Fresh Street is an intervention offering non-means-tested food vouchers in areas of high deprivation, using a place-based approach (*Fresh Street*, no date). As far as the researcher is aware, this combination makes it the first of its kind globally.

In the UK, two other food voucher schemes aim to increase healthy food consumption. Healthy Start is a government initiative which provides healthy food-specific vouchers to young families already on means-tested benefits (Healthy Start, 2024) and has shown positive dietary impacts (Griffith, von Hinke and Smith, 2018). While the Alexandra Rose Charity similarly offers means-tested vouchers to young families, it focuses on local markets (Alexandra Rose Charity, 2024b).

There are many other psychological barriers, such as knowledge, time, and convenience, which impact FV consumption and contribute towards the intention-behaviour (IB) gap (Munt, Partridge and Allman-Farinelli, 2017; Wolfson *et al.*, 2019). This phenomenon refers to the disconnect between wanting to change a behaviour and actually implementing it (Ajzen, 1991). To help bridge the IB gap in nutrition, food voucher schemes like Fresh Street integrate economic incentives with educational resources, such as nutritional information and recipes, to promote awareness of the importance of a healthy diet (An, 2012; Relton *et al.*, 2025).

Combining these hard and soft approaches is a common strategy within Nudge Theory (Thaler and Sunstein, 2008). Due to their proven effectiveness, nudges are frequently employed in dietary interventions, particularly to improve FV consumption (Szasz *et al.*, 2018; Vecchio and Cavallo, 2019; Almeida *et al.*, 2024).

1.2 Research Purpose

Fresh Street is a unique research project focused on the feasibility of a food voucher scheme to increase FV consumption. As such, any information is limited to its own publications and post-hoc reports.

With the overarching aim of understanding the key success factors, this study will break down Fresh Street interventions into their core elements. In order to bridge the gap between the emergent concepts and their effectiveness, this study employs nudge theory due to its established methods in improving FV consumption. Additionally, the behavioural economic foundations of nudge theory justify the efficacy of each concept.

The nudge concepts this study will apply to Fresh Street are financial incentives, default options, convenience, framing, and social norms (Thaler and Sunstein, 2022). By examining the varied delivery styles and outcomes of recent interventions in Reading, Plymouth and Bassetlaw, this study applies a systematic framework to provide clarity on the impact of each intervention and offer practical recommendations for future schemes.

To deconstruct Fresh Street, in-depth interviews were conducted with key representatives. These interviews offered valuable insights into the contribution of each component to the scheme's effectiveness and how they varied across locations.

1.3 Dissertation Outline

This dissertation comprises five chapters. Chapter One introduced the context and purpose of this study. Chapter Two reviews the extant literature on the intention-behaviour gap, barriers to FV consumption, applications of nudge theory, and an overview of Fresh Street's previous interventions. Chapter Three outlines and justifies the chosen methodological approach. Chapter Four presents the findings from three interviews, applying each component of the interventions to the nudge framework before discussing how each contributes to the scheme's effectiveness. Chapter Five concludes with this study's practical and theoretical applications, limitations and suggestions for future research.

2. Literature Review

This literature review begins by examining the barriers which contribute to the IB gap in FV consumption. It then evaluates the five concepts of nudge theory that will be used in the nudge framework before exploring the findings from previous Fresh Street interventions. The chapter concludes by presenting the research gap and the questions this dissertation will answer.

2.1 The Intention-Behaviour Gap

The intention-behaviour (IB) gap describes the difference between an individual's intentions to perform a behaviour and actually performing the behaviour (Ajzen, 1991), such as saying you will go to the gym after work but going straight home instead.

The IB gap is frequently observed in health-related behaviours, including FV consumption (An, 2012; Gardiner and Bryan, 2017). To demonstrate this, in the UK, 80-95% of adults are aware of the 5-a-day guidelines (Network Health Digest, 2017), but only 29% meet them (NHS Digital, 2019).

2.1.1 Barriers to Fruit and Vegetable Consumption

The literature identifies numerous psychological and structural barriers that contribute to the IB gap, many of which disproportionately affect individuals with lower socioeconomic status (Munt, Partridge and Allman-Farinelli, 2017; Relton *et al.*, 2022). The most frequently cited are high costs, limited access, time constraints, and gaps in knowledge and skills (Venn *et al.*, 2018; Wolfson *et al.*, 2019). These barriers are often linked to a higher reliance on convenience foods, which are typically highly processed and rich in calories, fat, sugar, and salt (Wolfson *et al.*, 2019).

Cost and Access

In the UK, meeting the 5-a-day guideline varies significantly by income, costing 45% of disposable income for the lowest quintile compared to just 11% for the highest quintile (DEFRA, 2024). This disparity is driven by the relatively high cost of healthy foods, as they are over twice as expensive per calorie as unhealthy foods (Betty, 2013; DEFRA, 2024).

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Although convenience stores aim to increase geographical access, they fail to address financial barriers, with mark-ups ranging from 11-21% (Webb, 2024), and often lacking fresh produce (Hickman, 2007). These higher prices affect those without a car or the means to access the lower prices offered by larger supermarkets or discount retailers like Lidl and Aldi (Webb, 2024). These areas with limited access to affordable, nutritious food are termed “food deserts” (Butler, 2018).

Convenience

The time constraints and gaps in knowledge and skills identified in the literature pertain to the planning, purchasing, preparing and cooking of FV, suggesting a perceived lack of convenience (Munt, Partridge and Allman-Farinelli, 2017; Venn *et al.*, 2018). Munt, Partridge and Allman-Farinelli (2017, p.9) observed that, during stressful or busy periods, individuals are less likely to prepare nutritious meals and consume more convenience foods, like takeaways, to “facilitate a sense of more time”. The widespread availability of takeaways underscores their convenience, particularly in the UK’s most deprived communities, where there are five times as many fast-food outlets than the least deprived, earning them labels like “fast food hotspots” (Public Health England, 2018) or “food swamps” (Butler, 2018), further deepening socioeconomic dietary disparities.

Conversely, cooking courses have been shown to increase individuals’ confidence and consumption of FV, even in a one-year follow-up (Garcia *et al.*, 2014). Hidrobo *et al.* (2014) found that increased nutritional knowledge partially induced the behaviour change in a financial incentive scheme, and Munt, Partridge and Allman-Farinelli (2017) highlight knowledge and skills are essential during food shopping to plan and reduce food waste.

While these barriers are common in the literature, other factors may be affecting the Fresh Street participants, therefore forming the first research question:

RQ1: *What factors contribute to the intention-behaviour gap in FV consumption among participants of the Fresh Street initiative?*

2.1.2 Reducing the IB Gap Through Nudging

To address the IB gap in FV consumption, nudge theory is often used. For example, moving items to eye level increases sales (Arno and Thomas, 2016), and replacing chocolate with fruit at shop tills increases fruit purchases (Van Gestel, Kroese and De Ridder, 2018), demonstrating the cost-effective nature of nudging for improving behaviour without limiting choice (Szasz et al., 2018; Vecchio and Cavallo, 2019).

Reviews of the literature on nudge interventions find that most target dietary behaviours, particularly FV consumption (Szasz et al., 2018; Vecchio and Cavallo, 2019). Healthy food consumption increases by 15%, on average, through improved access, increased variety of FV, social norms, and default options (Arno and Thomas, 2016; Friis et al., 2017; Vecchio and Cavallo, 2019). The positive impact of nudges on FV consumption underscores why combining aspects of nudge theory with Fresh Street's components will help determine their individual and collective effectiveness.

2.2 Nudge Theory

Nudge Theory was introduced by Thaler and Sunstein in their book *Nudge: Improving Decisions About Health, Wealth and Happiness* (2008). Nudging suggests using subtle interventions to guide behaviour, formally defined as:

“Any aspect of the choice architecture that alters people’s behaviour in a predictable way without forbidding any options or significantly changing their economic incentives” (Thaler and Sunstein, 2022, p.8).

The concept of choice architecture is described by Hollands et al. (2013, p.3) as:

“Interventions that involve altering the properties or placement of objects or stimuli within micro-environments with the intention of changing health-related behaviours”.

Nudge theory draws on several behavioural economic principles, such as social proof, which demonstrates how behaviour can be influenced by observing the actions of others (Cialdini, 1984). For example, rather than simply advising “plan your meals to reduce food waste and save money”, stating that “90% of households in this area meal prep to reduce food waste and save money” is often more persuasive.

2.2.1 Financial Incentives

Nudge interventions often incorporate financial incentives to encourage positive behaviours or penalise suboptimal ones (Thaler and Sunstein, 2022). For example, the single-use plastic bag charge in UK supermarkets reduced their use by 95% (DEFRA, 2021). The literature finds that financial incentives are effective in modifying dietary behaviours (An, 2012; Griffith, von Hinke and Smith, 2018). However, some suggest that combining financial incentives with policy interventions may dilute their impact, rendering the financial component redundant (Fanghella, Ploner and Tavoni, 2021).

Some financial incentive interventions reward healthy food purchases and consumption (Phipps *et al.*, 2015; Gardiner and Bryan, 2017), while others directly subsidise costs (An, 2012; Betty, 2013; Griffith, von Hinke and Smith, 2018). While consumption generally improves only during intervention periods (Betty, 2013; Phipps *et al.*, 2015), some evidence suggests these effects may persist in the long term (Caldwell *et al.*, 2009). For example, Gardiner and Bryan (2017) found that financial incentives increased FV consumption, but participants' improved attitudes towards FV and heightened sense of control over their eating habits may have partially contributed to this.

Vouchers

Vouchers are used to encourage spending on particular goods or services, including food, education, and housing (Bradford and Shaviro, 1999). Within Bohnenberger's (2020, p.8) welfare benefits framework, "needs" vouchers ensure the fulfilment of basic needs for lower-income groups, while "shift" vouchers aim to encourage improved consumption behaviours, similar to Fresh Street's vouchers (Relton *et al.*, 2020). Shift vouchers tend to achieve high uptake and acceptance rates by influencing consumption through financial incentives and adjustments in "availability or price", classifying them as a form of nudging (Bohnenberger, 2020, p.14).

Bohnenberger (2020) proposes that vouchers may bridge the gap between Universal Basic Income (UBI) and Services (UBS), particularly when they are considered cash-equivalent. Vouchers are cash-equivalent if recipients use them similarly to cash benefits – for instance, spending £10 from a voucher in the same way as £10 in cash (Bradford and Shaviro, 1999). Vouchers with this perception offer recipients greater

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flexibility and autonomy, therefore helping to alleviate negative associations with welfare schemes, such as food banks (Bruckner *et al.*, 2021).

These findings underscore the significance of vouchers in influencing healthy food choices, supporting this investigation into Fresh Street's food voucher scheme. An overview of Fresh Street's counterparts provides practical voucher design considerations.

Healthy Start

Healthy Start is an NHS initiative providing monthly allowances via a prepaid card to families receiving means-tested benefits (Healthy Start, 2024). Parents receive £4.25 per child under four per week, doubling to £8.50 for children under one (Healthy Start, 2024). The card is used for healthy foods such as FV, pulses and milk.

Griffith, von Hinke and Smith (2018) found that Healthy Start vouchers increased household spending on fresh FV by 14%, similar to Arno and Thomas' (2016) nudge finding, outperforming equivalent-value cash benefits. While this increase was attributed solely to the economic incentive aspect, McFadden *et al.* (2014) found that some stated the vouchers' existence provided a reminder to eat healthy foods.

Although there was concern that increased disposable income might be reallocated towards unhealthy foods, findings indicated that household nutrient consumption improved, with no corresponding increases in sugar or fat levels (Griffith, von Hinke and Smith, 2018). Moreover, households with initially lower FV consumption exhibited the most significant increase in purchasing. Despite these positives, the scheme faces some challenges.

Low Uptake

Digitalisation in 2022 transformed Healthy Start from paper vouchers to a prepaid card, enhancing ease of use and increasing uptake rate by 50% (iHV, 2024). However, barriers such as language difficulties and digital illiteracy have led to application rejections that discourage eligible families from reapplying (McFadden *et al.*, 2014; Barrett, Spires and Vogel, 2024). Even though midwives and health visitors support applications, these barriers and low awareness mean that only 62.4% of eligible families are enrolled (McFadden *et al.*, 2014; iHV, 2024).

Stigma

Perceptions of the scheme as a “handout” rather than a health-driven initiative focused on enhancing child well-being have contributed to stigma among users (Barrett, Spires and Vogel, 2024), a phenomenon also observed in similar programs (Bruckner *et al.*, 2021). The prepaid card alleviated some of this stigma by increasing flexibility as it is usable in any Mastercard®-accepting store (Barrett, Spires and Vogel, 2024; Healthy Start, 2024).

Eligibility Criteria

Eligibility criteria have exacerbated concerns among families. Despite rising inflation and worsening cost-of-living conditions, the guidelines remained unchanged (McFadden *et al.*, 2014). Furthermore, the age cutoff once children turn four makes healthy foods unaffordable, despite children’s new preferences (Barrett, Spires and Vogel, 2024).

Alexandra Rose Charity

The Alexandra Rose Charity provides means-tested ‘Rose’ vouchers for fresh FV from local markets to young families, similar to Healthy Start (Alexandra Rose Charity, 2024b). Families are identified and enrolled through children’s centres and community organisations. They receive £4 per child per week, increasing to £6 for children under one (Alexandra Rose Charity, 2024b). Currently, Rose vouchers are accepted at eight local markets across the UK.

User testimonies highlight several benefits of the scheme, including access to a wider variety of produce, diet improvements in children, an increase in home-cooked meals, and enhanced energy and mental health levels, particularly among mothers (Alexandra Rose Charity, 2024a). Reported stigma was low as many viewed the scheme as a dietary improvement tool, contrasting Healthy Start (Barrett, Spires and Vogel, 2024).

Financial Incentives in the Framework

Both existing schemes and previous nudge interventions show that financial incentives and targeted (shift) vouchers effectively increase FV consumption, justifying their use in this nudge framework and forming the second research question:

RQ2: How do Fresh Street's food vouchers influence participants' purchasing and consumption behaviours of FV?

Interestingly, Healthy Start's digital format reduced stigma compared to paper vouchers, while Rose voucher users liked their tangible nature. This is perhaps because paper vouchers resemble cash, which is the preferred payment method at local markets, while card is preferred at supermarkets (Stripe, 2023). This supports Fresh Street's paper vouchers but calls for a further examination of how the design of the vouchers themselves influences behaviours and perceptions.

2.2.2 Default Options

Default options are a powerful nudge tool for guiding individuals toward socially optimal choices by leveraging the status quo bias – the tendency to stick with the current state (Samuelson and Zeckhauser, 1988). This bias arises from the perception of high switching costs, loss aversion, and sunk costs, particularly in those with weaker preferences. Default options are predominantly used to suggest a socially optimum choice in complex decision environments to alleviate cognitive load (Samuelson and Zeckhauser, 1988; Thaler and Sunstein, 2003). For example, pension contributions often set a default to ensure everyone has some future savings, but individuals are free to switch plans (Thaler and Sunstein, 2022).

This concept underpins the philosophy of libertarian paternalism, which balances the paternalistic guidance of defaults with the freedom of choice (Thaler and Sunstein, 2003). However, defaults are often considered as leaning towards paternalism. Sunstein (2016) argues that as long as they align with individual preferences and alternatives are easy to choose, then this is not the case.

A prominent example is the higher organ donor rates seen in opt-out policy countries than those with opt-in systems. While changing the default is argued as paternalistic, Johnson and Goldstein (2003) demonstrated that when individuals do have a choice, their preferences align with those in an opt-out system. By exploiting the status quo bias, changing the default option can have significant effects as many perceive the psychological barriers of switching as too high.

Dinner *et al.* (2011) propose that default options operate through three mechanisms: endorsement, ease and endowment. These suggest that individuals trust the choice architects' decision, prefer not to switch, and compare alternatives to the default, and Jachimowicz *et al.* (2019) suggests these are most effective in combination.

Default Options in the Framework

Within food voucher schemes, Healthy Start vouchers operate as a default by pre-allocating funds towards healthy food purchases, thereby reducing cognitive load associated with 'mental accounting' (Thaler, 1985). Evidence from Griffith, von Hinke and Smith (2018) indicates that such defaults can effectively boost FV consumption. By ensuring that households automatically channel resources towards healthier options, these defaults take full advantage of the status quo bias, as individuals are less inclined to deviate from the pre-selected, convenient option. This insight is critical in addressing whether the FV-specific nature of Fresh Street's food vouchers influences FV purchasing and consumption behaviours.

2.2.3 Convenience

Thaler and Sunstein (2022, p.106) emphasise that effective nudges must first "Make It Easy". They argue that eliminating small barriers is often more impactful than attempting to redirect an individual's behaviour entirely. By simplifying decision-making processes and reducing these frictions, individuals are more likely to adopt the desired behaviour.

As discussed previously, reducing the distance individuals must travel to access fresh FV significantly increases consumption (Caldwell *et al.*, 2009), while food deserts hinder healthier eating (Dutko, Ver Ploeg and Farrigan, 2012; Wolfson *et al.*, 2019).

Haider *et al.* (2022) proposed consolidating households' online food orders for delivery to local stores, reducing costs and improving access in food deserts. This evidence suggests improved access for households and reduced delivery costs by up to 409%. However, its effectiveness may be limited in rural or low-density neighbourhoods due to lower demand.

Convenience in the Framework

Improving access to FV is essential for improving diet quality, as outlined in DEFRA's Food Security Report (2024). Fresh Street introduces market stalls or pre-packed FV

boxes to intervention areas, making convenience a central component of the scheme and this framework.

2.2.4 Social Norms

Social norm nudges utilise individuals' desire to conform to societal expectations (Thaler and Sunstein, 2008), and is underpinned by Cialdini's (1984) social proof theory. Thaler and Sunstein (2022) provide an example in which a Republican judge votes more liberally when placed with two Democratic judges and *vice versa*.

Social norm-driven behaviour changes are influenced by social norms themselves, being told what others are doing, and observability, where seeing what others are doing amplifies the impact of social norms (Dannenberg, Klatt and Weingärtner, 2024). The degree of influence may vary by decision type, assuming that social norms impact insignificant, short-term choices more than long-term habits (Dannenberg, Klatt and Weingärtner, 2024).

Li, Zhang and Pagán (2016) found that a mass nutritional education campaign aimed at using social norms had an overall positive effect on FV consumption, but to enhance social norm impacts on overall health, they suggest combining similar educational programs with subsidies, particularly in disadvantaged communities.

Social Norms in the Framework

The concept of observability may explain why Healthy Start users expressed stigma, but Rose recipients did not. If users feel isolated in their use of vouchers, the associated stigma may be higher. For instance, Healthy Start vouchers are redeemable at various supermarkets, reducing the likelihood of encountering other users. In contrast, local markets may operate only one day a week, increasing the chances of recipients interacting with others using Rose vouchers. This contrast highlights the strengths of Fresh Streets's non-means-tested, place-based approach and is an interesting consideration for its success. The non-means-tested nature also addresses concerns around eligibility.

2.2.5 Framing

Framing plays a crucial role in determining the effectiveness of a nudge. For example, consider these two statements:

1. By reducing food waste, you could save £20 a week on groceries.
2. Every week, you throw away £20 worth of food.

Despite conveying the same information, Kahneman and Tversky's (1984) theory of loss aversion suggests that emphasising loss can be more effective for changing behaviour (Statement 2).

Jung and Mellers (2016) found that the effects of framing vary by personality, suggesting that greater transparency about a nudge's intentions and their source will improve public attitudes. Similarly, Thaler and Sunstein (2003) find that nudges are more successful when aligned with social optimums and preferences. Using Kahneman's (2011) System 1 (automatic) and System 2 (reflective) framework for thinking, Thaler and Sunstein (2022) emphasise that most decisions call on System 1, often acting more intuitively, making short-term-decision nudges more effective (Almeida *et al.*, 2024), particularly regarding food (Jung and Mellers, 2016).

Framing in the Framework

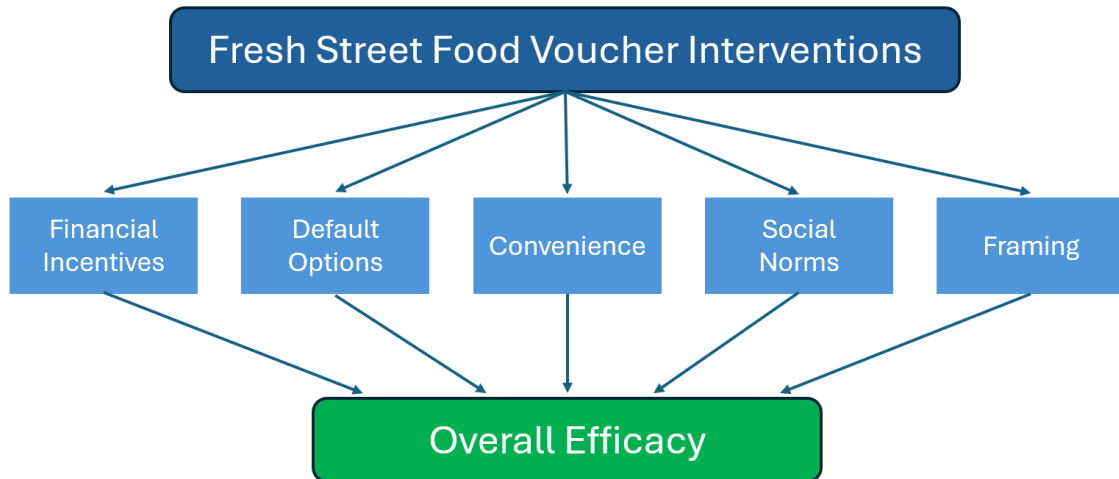
The impact of framing on food voucher schemes was highlighted by Barrett, Spires and Vogel (2024) in the context of Healthy Start. Participants suggested that reframing the scheme as a child-health initiative could mitigate stigma, as the vouchers are often perceived as "handouts" or "benefits" (Barrett, Spires and Vogel, 2024, p.6). This highlights Fresh Street's non-means-tested nature and also its combination of educational initiatives alongside a financial incentive.

2.2.6 The Nudge Framework

This section analysed how nudge theory has impacted FV consumption in previous interventions. Each element of nudge theory considered in this literature review has relevance to the Fresh Street scheme, hence forming the framework to help understand its effectiveness (Figure 1). Combining these justifications forms the final research question:

RQ3: To what extent are the propositions of nudge theory useful in the design of Fresh Street's FV-specific food voucher scheme?

Figure 1: Conceptual Framework for Fresh Street Using Nudge Theory



2.2.7 Limitations of Nudge Theory

Despite the success of 80% of healthy eating nudge interventions (Vecchio and Cavallo, 2019), several limitations persist. Publication bias can distort perceived effectiveness, as only successful interventions are often published (Broers *et al.*, 2017; Lycett *et al.*, 2017; Vecchio and Cavallo, 2019). Results for dietary interventions may also be skewed by their reliance on self-reported data (An, 2012; Gardiner and Bryan, 2017). Additionally, Szaszi *et al.* (2018) highlight that sample size issues limit reliability, noting that lab studies average only 200 participants, and some results are unreported due to their field nature (Broers *et al.*, 2017).

These methodological issues impact the apparent quality and effectiveness of interventions (Lycett *et al.*, 2017; Szaszi *et al.*, 2018; Vecchio and Cavallo, 2019). Ethical concerns, such as paternalism, have already been discussed. To mitigate these, Vecchio and Cavallo (2019) suggest improving ethical regulation and tailoring future intervention designs.

2.3 Case Study: Fresh Street

Fresh Street's place-based approach targets areas with high food insecurity, poor diet quality and significant deprivation (Relton *et al.*, 2020). All households in these areas receive food vouchers weekly, regardless of income, size or type (Relton *et al.*, 2024). This non-means-tested approach aims to reduce the stigma associated with schemes like Healthy Start (Relton *et al.*, 2020; Barrett, Spires and Vogel, 2024).

Although the vouchers are only redeemable at local FV markets, this was positively received, with participants noting better quality and variety of FV than at supermarkets (Relton *et al.*, 2020). Fresh Street uses paper vouchers, enabling households to share unused vouchers and visualise their weekly budget, akin to cash (Relton *et al.*, 2020). The vouchers are delivered with healthy eating recommendations, nutritional information, and recipes. Combining dietary education with financial incentives has been shown to effectively bridge the IB gap in FV consumption (An, 2012; Phipps *et al.*, 2015; Li, Zhang and Pagán, 2016; Gardiner and Bryan, 2017; Relton *et al.*, 2025).

Evaluation of Fresh Street's Effectiveness

Fresh Street has conducted five studies: two feasibility studies in Barnsley and Sheffield, and three Randomised Control Trials (RCTs) in Doncaster, Bradford, and Tower Hamlets. Weekly household participation ranged from 75-95%, with voucher redemption rates of 67-97% (Table 1; Relton *et al.*, 2025), exceeding Healthy Start's 62.4% uptake rate (iHV, 2024). The Barnsley study collaborated with the Alexandra Rose Charity to deliver 'Rose' vouchers, whereas later interventions used Fresh Street vouchers (Relton *et al.*, 2022).

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Table 1: Household Participation and Voucher Distribution and Redemption for Fresh Street's Previous Interventions

Site Number of intervention streets	Types of fruit and vegetable vendors (distance from streets)	Duration of exposure (weeks)	Weekly household participation rate ^b	Vouchers distributed/ vouchers redeemed	Average weekly voucher spend		
					Households receiving envelopes (<i>n</i> = 322)	All eligible households (<i>n</i> = 375)	
Pilot RCT (2021–22)							
3	Tower Hamlets	Four outdoor market stalls (~ 0.5 miles)	43	75% (73/97)	84% (£10,216/£12,170)	£3.26	£2.44
3	Bradford	Two indoor market stalls (~ 3 miles), One local community centre shop (~ 0.2 miles), One van weekly visits to streets	40	83% (104/125)	67% (£11,730/£17,440)	£2.82	£2.35
3	Doncaster	Two indoor market stalls (~ 2.5 miles)	19	95% (145/153) ^c	54% (£4057/£7535)	£1.47	£1.39
Previous feasibility studies (2017–2018)							
1 ^a	Sheffield	Two indoor market stalls (3 miles) & weekly veg bag delivery to flats	56	79% (41/52)	97% (£10,641/£11,000)	£4.63	£3.65
4	Barnsley	Three indoor market stalls (3 miles) or local shop (~ 0.3miles)	52	82% (80/97)	88% (£17,575/£19,982)	£4.22	£3.48

^aOne block of flats

^bHouseholds receiving weekly envelopes when notified that the scheme was ending relative to households offered envelopes at Week 1

^cNo checkpoint implemented in Doncaster thus some households receiving weekly envelopes may have not used any of the vouchers

(Source: Relton *et al.*, 2025, p.8)

A £5 mixed FV box was offered in Sheffield, but demand was low due to its limited choice (Relton *et al.*, 2022). In the RCTs, vouchers were redeemable at local independent FV vendors operating six days a week. Variations in redemption rates likely stemmed from market accessibility: for instance, Bradford initially had low uptake as the market was further away, but the introduction of an FV van improved uptake, while Tower Hamlets benefitted from multiple markets within half a mile (Relton *et al.*, 2024).

Available data in Table 1 indicates that the vouchers increased consumption of FV in Tower Hamlets and Bradford and boosted household spending across the five feasibility studies. Interviews with participants found consumption increased through enhanced attitudes towards healthy eating and alleviated concerns about running out between shops (Relton *et al.*, 2020). The local markets were valued for their quality, variety, affordability, and social connection (Relton *et al.*, 2022), while nutritional information and recipes enhanced dietary knowledge (Relton *et al.*, 2020).

Partnering with local vendors provided an element of market stability for both the vendors and the local economy, further contributing to the structural improvements the scheme addresses, such as reducing food deserts (Relton *et al.*, 2025). Vendors reported increased trade from both new and existing customers.

Fresh Street Unpacked

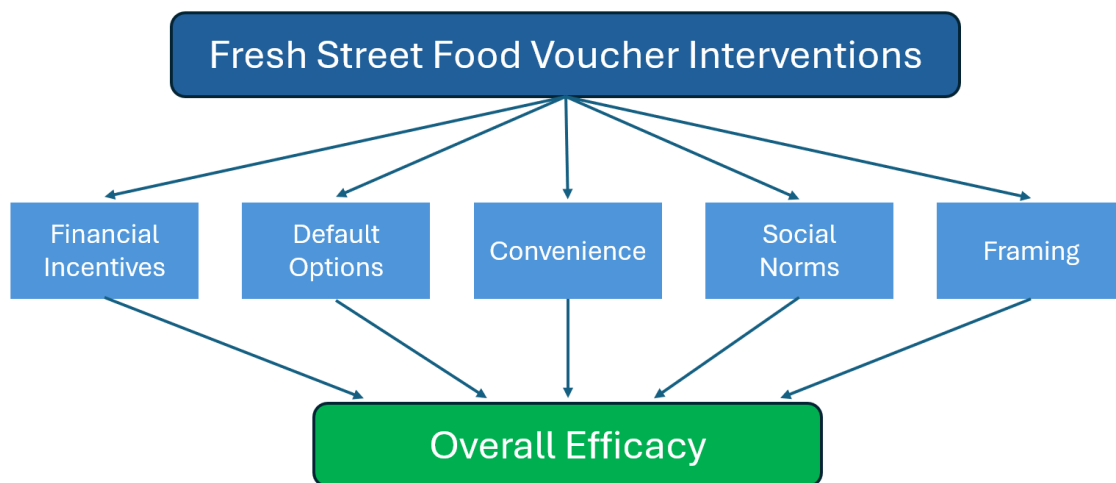
By combining hard approaches, like cost-reducing subsidies, with soft approaches, such as recipes and nutrition education, Fresh Street's approach aligns with the concepts of nudge. While the scheme initially aimed to tackle food insecurity and promote FV consumption, additional benefits included the greater use of fresh ingredients, strengthened social connections, and improved mental health (Relton *et al.*, 2020).

2.4 Conclusion

This literature review outlined the barriers contributing to the intention-behaviour gap in FV consumption and how nudge theory elements have been used to bridge it. Financial incentives are shown to increase FV consumption, particularly when combined with nutritional information (An, 2012; Gardiner and Bryan, 2017; Relton *et al.*, 2020).

This study analyses Fresh Street's overall effectiveness and the drivers of its success. Given that delivery and outcomes vary by location, breaking down and categorising its interventions into the five concepts of nudge theory will help identify key components. The framework, shown in Figure 1 below, hopes to provide practical contributions for future schemes.

Figure 1: Conceptual Framework for Fresh Street Using Nudge Theory



Fresh Street Unpacked

While nudge theory has been widely researched in dietary interventions, there is limited qualitative data on UK food voucher schemes from a managerial perspective and none on Fresh Street. Previous studies, such as McFadden *et al.* (2014) and Barrett, Spires and Vogel (2024) focused on participant experiences, similarly, Fresh Street literature has examined feasibility with a participant perception focus (Relton *et al.*, 2020, 2022, 2025; Pan *et al.*, 2025).

To address this gap, in-depth interviews with Fresh Street representatives were conducted to answer the following research questions:

RQ1: What factors contribute to the intention-behaviour gap in FV consumption among participants of the Fresh Street initiative?

RQ2: How do Fresh Street's food vouchers influence participants' purchasing and consumption behaviours of FV?

RQ3: To what extent are the propositions of nudge theory useful in the design of Fresh Street's FV-specific food voucher scheme?

3. Methodology

3.1 Introduction

This chapter will outline the methodological approach employed to address the following research questions:

RQ1: *What factors contribute to the intention-behaviour gap in FV consumption among participants of the Fresh Street initiative?*

RQ2: *How do Fresh Street's food vouchers influence participants' purchasing and consumption behaviours of FV?*

RQ3: *To what extent are the propositions of nudge theory useful in the design of Fresh Street's FV-specific food voucher scheme?*

First, it presents the research philosophy, approach, and design, followed by a discussion of the data collection methods and their justification. It also details the methods of analysis and acknowledges any limitations of the study.

3.2 Research Philosophy

Ontology and epistemology are key philosophical stances underpinning social science research, examining the study of reality and the study of knowledge, respectively (Goertz and Mahoney, 2012; Bell, Harley and Bryman, 2022).

Ontology encompasses two perspectives: objectivism and constructionism (Bell, Harley and Bryman, 2022). Objectivism considers social phenomena as independent of social actors, whereas constructionism sees social phenomena and their meanings as continuously shaped by social actors (Bell, Harley and Bryman, 2022). This study adopts a constructivist ontological approach, as the interaction between social actors and the voucher scheme is central to its success in increasing FV consumption. Exploring representatives' perceptions of reality is crucial to understanding the perceived mechanisms the scheme works through and the barriers it aims to address.

Epistemology is shaped by the ontological positioning (Bell, Harley and Bryman, 2022). A positivist epistemology applies natural science study methods to social reality,

whereas interpretivism seeks to understand human behaviour by exploring its underlying mechanisms (Bell, Harley and Bryman, 2022). This study adopts a pragmatic epistemology, which focuses on practical outcomes and real-world applications (Kelly and Cordeiro, 2020). Pragmatism aligns with the research's aim to evaluate how a nudge theory framework supports understanding Fresh Street's effectiveness. Offering actionable insights for future scheme design by categorising its components within five nudge concepts: financial incentives, default options, convenience, framing, and social norms.

3.3 Research Approach and Design

Building on the philosophical foundations, an abductive qualitative research strategy was deemed the most suitable. Abduction combines existing theories and knowledge to identify emerging themes and patterns (Kelly and Cordeiro, 2020). While this research employs deductive reasoning to align Fresh Street's components with existing theoretical nudge concepts, additional insights, such as the importance of community raised during interviews, enriched the analysis. These observations prompted a refinement of the framework and interview guide, exemplifying abductive reasoning by integrating external knowledge to develop a more comprehensive understanding of the scheme's success (Kelly and Cordeiro, 2020). Abduction is well-suited to case studies given its focus on generating practical implications for future applications (Kelly and Cordeiro, 2020).

Qualitative research was chosen to gain a deeper understanding of how and why the scheme's effectiveness aligned with the nudge framework (Fossey *et al.*, 2002). This approach allowed the researcher to explore how this novel combination of nudge concepts worked in practice, offering insights for future interventions (Fossey *et al.*, 2002).

Exploring a single case study, Fresh Street, provided rich data on the specific mechanisms which drive its effectiveness. Its unique place-based and non-means-tested nature was of particular interest. By focusing on the detailed and distinctive aspects of Fresh Street's methods, this research aimed to enhance the understanding of how food voucher schemes can operate in the UK, prioritising depth over generalisation (Bell, Harley and Bryman, 2022).

A cross-sectional research design was employed to gather data from representatives across locations, capturing their perceptions of the scheme at a single point in time. Interviews provided diverse insights, which were analysed for themes, patterns, and connections to research questions and theory (Wang and Cheng, 2020; Adeoye-Olatunde and Olenik, 2021). While cross-sectional, interviewees' retrospective observations offered valuable insights into the scheme's effectiveness and alignment with the nudge framework. This design was selected for its cost-effectiveness and ease of implementation, given temporal and economic constraints (Wang and Cheng, 2020).

3.4 Data Collection Methods

Given the research design and strategy, fifty-minute interviews with key Fresh Street representatives across the UK were deemed appropriate, as Adams (2015) suggests a sixty-minute maximum to avoid fatigue for both parties. Semi-structured, in-depth interviews were conducted to capture the representatives' subjective reality of the scheme (Bell, Harley and Bryman, 2022). These methods enable researchers to explore a broad range of concepts in-depth, while the semi-structured format ensures relevance to research questions and flexibility to address emerging topics (Adams, 2015).

An interview guide (Appendix 1) was developed to structure the interviews and outline key concepts for questioning, aiding in preparation and providing prompts to enrich interviewees' responses (Adeoye-Olatunde and Olenik, 2021). Interviews were conducted online via Microsoft Teams, which facilitated both recording and transcription. A practice interview with a peer ensured alignment with research topics and flow, allowing for refinements before conducting interviews (Adeoye-Olatunde and Olenik, 2021).

3.5 Sampling Procedure

Purposive sampling was employed to select participants based on specific criteria to answer the research questions (Adeoye-Olatunde and Olenik, 2021). Initially aimed at

gaining an in-depth understanding of one intervention, the criteria were later broadened to enable comparative analysis across interventions. This adjustment enriched the data by providing a more comprehensive view of the scheme's UK-wide operation and eliciting longer, more detailed responses.

Four key representatives from three scheme locations participated in fifty-minute interviews, providing sufficient depth to explore research topics and additional areas. Individual interview durations are presented in Table 2. The Bassetlaw interview included two participants unexpectedly; while B1 answered most interview questions, B2 supplemented the discussion. The researcher determined that their perspectives were not contrasting.

Table 2: Participant Interview Length

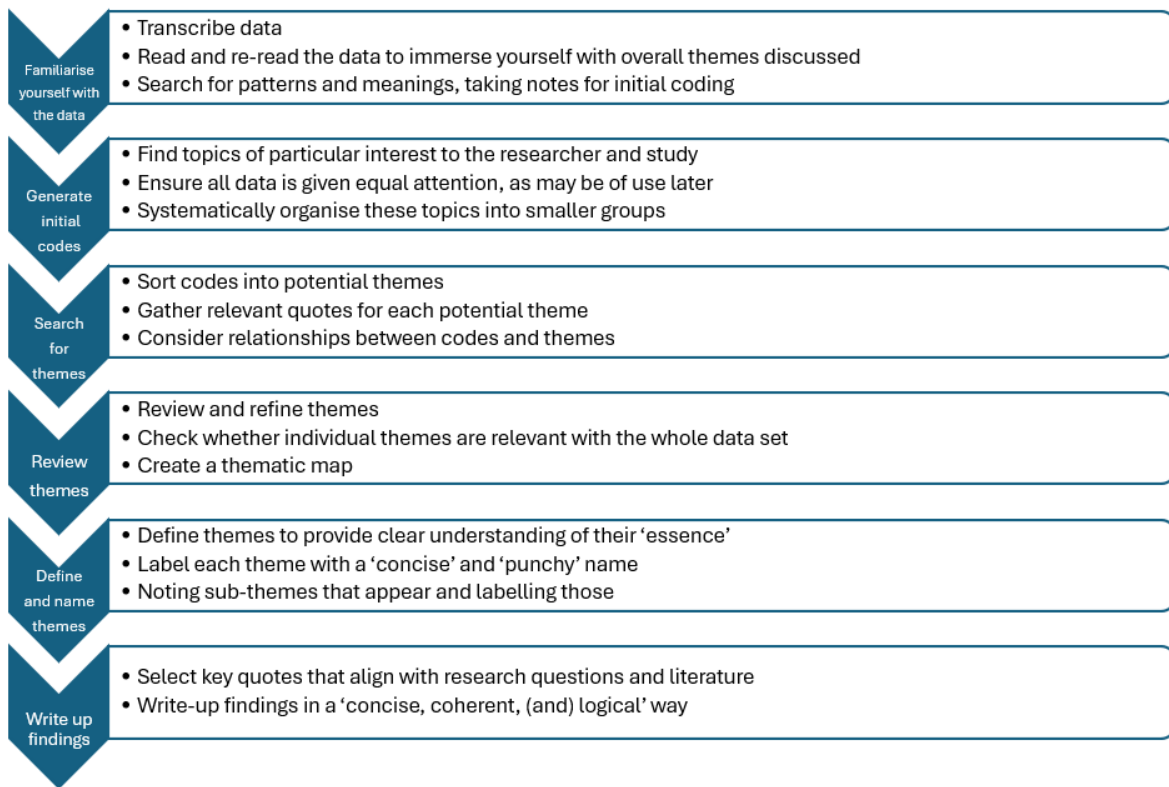
Participant	Location	Interview Length
R	Reading	54 minutes
P	Plymouth	45 minutes
B1 and B2	Bassetlaw	59 minutes

Thematic saturation, where no new codes or themes emerge, is commonly used to determine the adequacy of a sample size (Adeoye-Olatunde and Olenik, 2021). However, due to the small size of this initiative, the sample was limited to four representatives. Interviews with voucher recipients were considered but could not be conducted due to ethical constraints.

3.6 Data Analysis

To ensure best practice in thematic analysis, the researcher followed Braun and Clarke's (2006) six-stage framework (Figure 2). Transcriptions were immediately checked verbatim and reviewed to familiarise the researcher with the data before actively re-reading to identify patterns and meanings (Braun and Clarke, 2006). Prompt transcription minimised unprocessed data and ensured emphasis was accurately captured, such as correctly punctuated quotations (Braun and Clarke, 2006; Bell, Harley and Bryman, 2022).

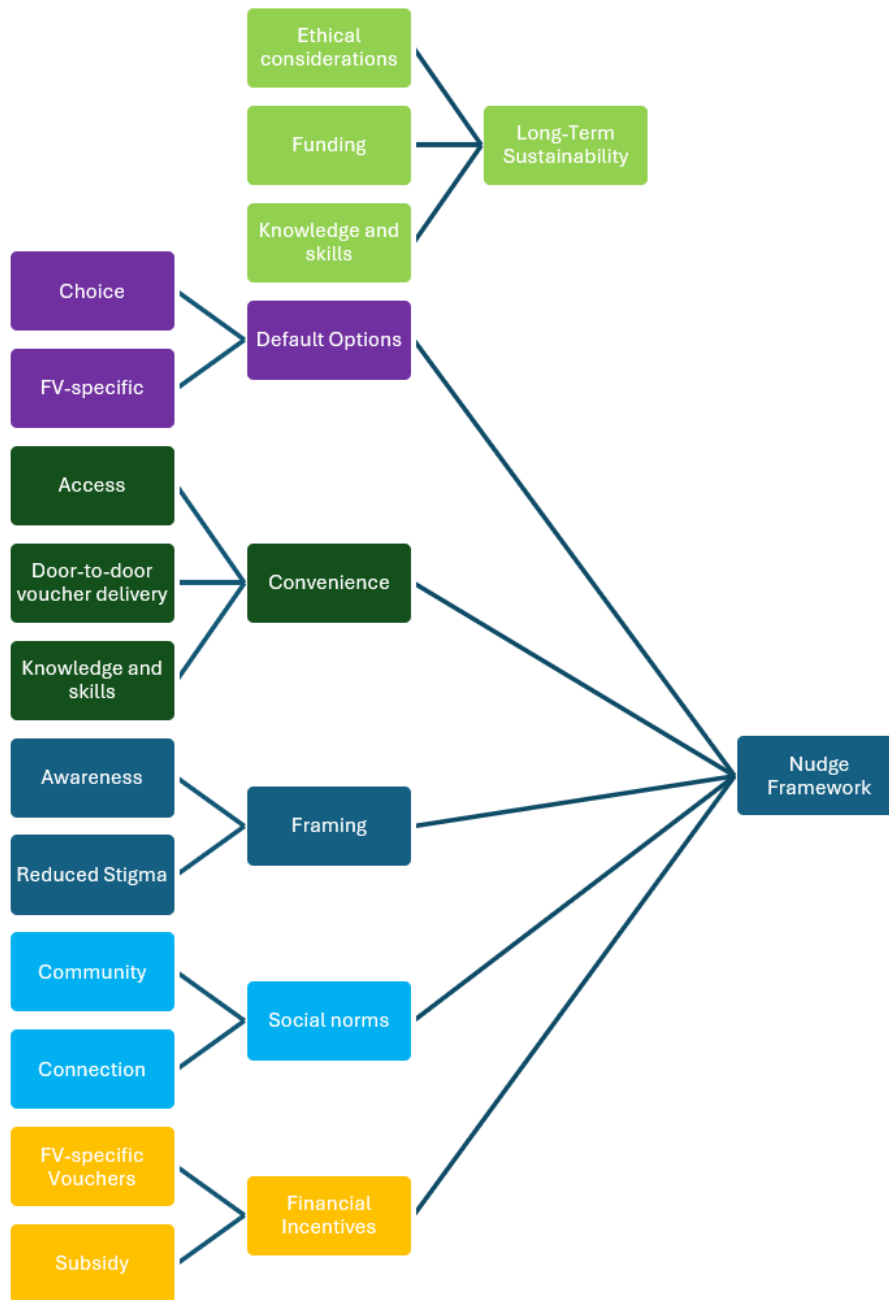
Figure 2: The Six Phases of Thematic Analysis



(Adapted from Source: Braun and Clarke, 2006)

The thematic analysis process involved identifying key topics and organising and interpreting the data through annotating, coding, and grouping codes into themes (Braun and Clarke, 2006; Bell, Harley and Bryman, 2022). Due to the small sample size, software like NVivo was deemed unnecessary (Adeoye-Olatunde and Olenik, 2021). Abductive coding, combining deductive and inductive approaches, was employed to note theory-relevant and 'anomalous' data points, followed by re-analysis to form abductive codes (Vila-Henninger *et al.*, 2024). After each interview, the researcher refined the research specification, interview guide, topics, and probes to better align with research questions and emerging themes (Adeoye-Olatunde and Olenik, 2021; Bell, Harley and Bryman, 2022). Figure 3 shows the emergent interview themes and their position within the framework, and individual codes are shown in Appendix 2.

Figure 2: Thematic Analysis from In-depth Interviews



3.7 Limitations

The retrospective nature of this study allowed representatives to reflect on the scheme's overall effectiveness, identifying the most impactful components and areas for improvement. While this combination of components in this framework is a novel approach, each element has been widely studied in the literature. Additionally, nudge strategies are often studied under specifically designed interventions, whereas this study shows their combined impact, which may be a limitation.

Secondly, interviewer bias can impact in-depth interviews, such as through the researcher's opinions or understanding of topics, potentially creating leading question (Salazar, 1990). This was addressed through reflexivity, where the researcher reflected on and revised question order to align with the natural conversation flow (Ahmed, 2024). Triangulating data from three interviews further enhanced the credibility of findings (Ahmed, 2024).

While the focus on Fresh Street limits generalisability, the findings offer valuable insights for designing similar schemes, particularly in providing a framework to understanding the situational effectiveness of each concept. Finally, the representatives' prolonged engagement with participants lends credibility to their perspectives, despite potential gaps in understanding individual household behaviour (Ahmed, 2024). Given this study's emphasis on nudge design, such limitations may be less impactful.

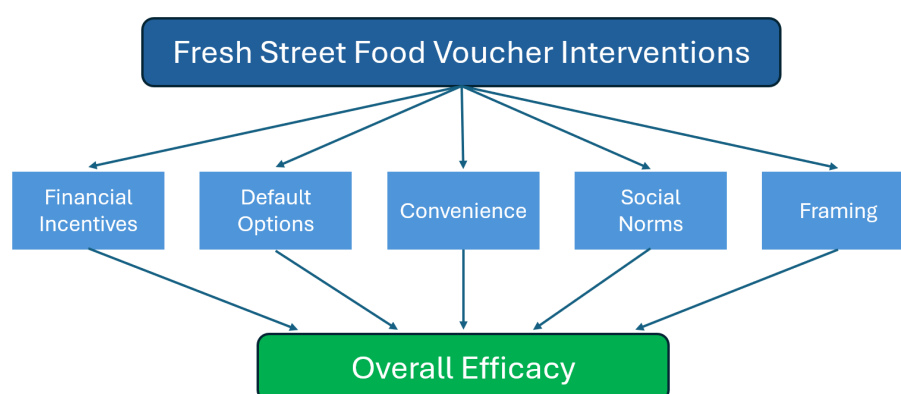
3.8 Ethical Considerations

Ethical approval for this research was granted by the University of Edinburgh Ethics Committee following submission of a detailed application outlining the study's scope. All participants were provided with a participant information sheet and signed a consent form before interviews commenced, ensuring they were informed of the research aims, purpose, and their right to withdraw at any stage. Verbal consent was also obtained prior to audio and video transcription. Transcriptions were securely stored on password-protected devices, accessible only to the researcher, and all participants' identities were anonymised.

4. Findings and Discussion

The first part of this chapter presents this study's findings and applies them to the nudge framework outlined by the literature review (Figure 1). In summary, Fresh Street's vouchers effectively increased FV consumption by improving access, enhancing knowledge and skills, and lowering financial barriers. The scheme also significantly increased social connection within these communities. The second part discusses how this framework helps demonstrate Fresh Street's effectiveness and answers the research questions.

Figure 1: Conceptual Framework for Fresh Street Using Nudge Theory



To provide an overview of these three interventions, Table 3 presents the location, representative, and size and scope of each intervention:

Table 3: Overview of Intervention Locations, Representatives, Size and Scope of the Interventions

Location	Representative(s)	Household Reach	Street Reach	Initial Length	Funding Extension
Reading	R	150 – intervention	10 intervention streets	12 months	5 months from Reading Borough Council
		150 – control			
Plymouth	P	150 – intervention	1 control	10 months	No
		150 – control	1 intervention		
Bassetlaw	B1 and B2	40	1	25 weeks	5 weeks

(Adapted from Source: Fresh Street Presentation, 2024; Fresh Street Community, no date; FoodSEqual Health, no date; Fresh Street Community Garden, no date)

Fresh Street Unpacked

Table 4 presents the location, representative(s), relevant organisations, scheme design and vouchers received:

Table 4: Overview of Intervention Locations, Representatives, Relevant Organisations, Scheme Design and Voucher Value of the Interventions.

Location	Representative(s)	Relevant Organisations	Scheme Design	Voucher Value
Reading	R	Whitley Community Development Association (WDCA) Vendor: Belchers & Sons	Weekly market stall on a Saturday 9:30 am – 11:30 am, available to all Engagement activities at the community centre (WDCA) – available to all study households	£10 weekly
Plymouth	P	FoodPlymouth Salvation Army Hall, Whitleigh Vendor: Tamar Fresh	Fortnightly £5 FV bag order and collection – available to all study households Collection: Thursday 10 am – 12 pm Monthly market: Saturday 11 am – 2 pm – available to all Engagement activities on collection days – available to all study households	£10 fortnightly
Bassetlaw	B1 and B2	Bassetlaw Community and Voluntary Service (BCVS) Vendor: Priory Fruit Shop	Weekly FV box collection from the community garden – only available to voucher recipients	£10 weekly

(Adapted from Source: Fresh Street Presentation, 2024; Fresh Street Community, no date; FoodSEqual Health, no date; Fresh Street Community Garden, no date)

4.1 Findings

4.1.1 Fresh Street's Overall Impact

Fresh Street collaborates with community centres and local organisations to secure funding and deliver a FV-specific voucher scheme for a defined intervention period. This initiative adopts a place-based, non-means-tested approach. R highlights that the core goal is to increase access to “*regular fresh fruit and vegetables*” from “*local suppliers*”, creating a “*trickle-down*” effect throughout communities.

Intervention areas are selected by combining the Index of Multiple Deprivation (IMD) scores with insights from Community Food Researchers (CFRs).

Overall, the scheme received positive feedback from participants:

“It’s been viewed as being an excellent scheme.” (P)

“The scheme itself was really well received. We asked the same question when we did the surveys with people on the project, and they said it’s been a fantastic scheme. We’ve loved every aspect of it. There’s nothing we would change.” (B1)

Consumption

Preliminary data indicates that daily FV consumption increased following the intervention, as measured by a 24-hour recall survey. Figure 4 illustrates that, compared to baseline data, FV consumption rose by 0.96 portions/day (40%) in Plymouth and 1.24 portions/day (49.4%) in Reading. Data was not provided for Bassetlaw. Additionally, follow-up data is not yet available as the interventions concluded in January 2025.

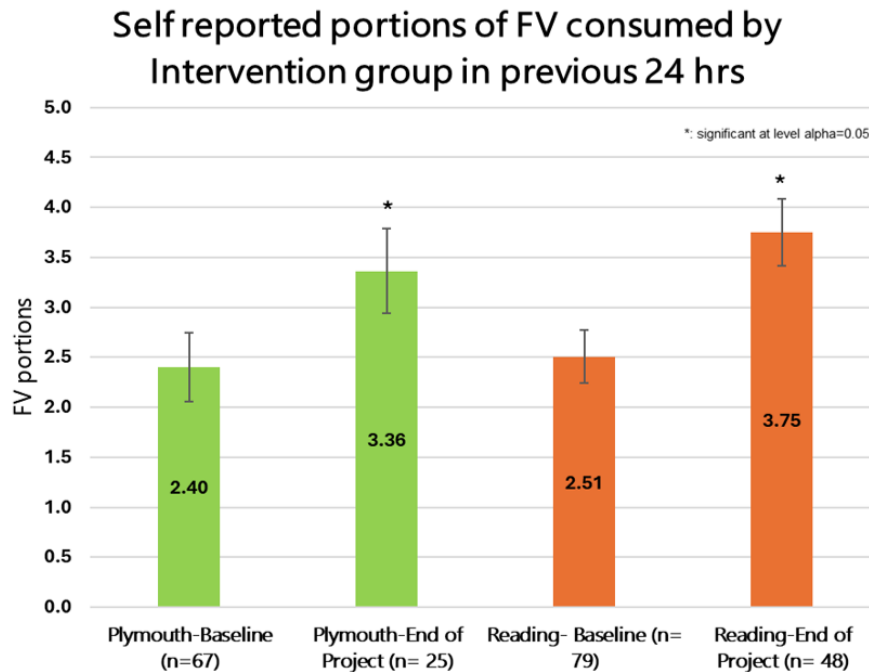
In addition to higher FV intake, participants reported improvements in both mental and physical health:

“They were cooking more from scratch because they had really nice fresh produce to do so, ... he was cooking using the veg and feeling the benefits of that.” (P)

“I think for the people who regularly attended, there was a real sense that I know this has done me good. ... ‘I’ve lost weight, and I feel better’.” (P)

Fresh Street Unpacked

Figure 3: Self-Reported Portions of FV Consumed by Intervention Group in Previous 24 Hours in Plymouth and Reading



Mean and standard error of mean are shown.

* Denotes significant difference at $P < 0.05$. Statistical test: Mann-Whitney U test

(Source: Data and Figure Provided Courtesy of Fresh Street)

4.1.2 The Impact of Nudge

This section explores how the findings apply to the nudge theory framework (Figure 1). Notably, community and social connection appeared as the main drivers of social norms.

4.1.2.1 Financial Incentives

While food vouchers are generally viewed as financial, Fresh Street's representatives felt theirs were "*more than just a voucher*" (P). R noted that the "*money is core*" and "*attracts people's interest*", but did not view the vouchers as solely financial, stating they are "*connectors*" that "*provide financial support*". R also said that:

"The financial incentive is an empowering tool for people. Money in your pocket gives you power and a sense of control." (R)

Fresh Street Unpacked

Justifying vouchers, not just providing free FV. Similarly, P highlighted that the financial aspect provided “*massive benefits*”, and that the vouchers gave access to “*all the extra supporting engagement activities*”.

In Bassetlaw, B1 noted that, pre-intervention, some households were “*limiting themselves to two items of fruit and veg on their weekly shop to account for budget*”, but now they “*don’t have to choose anymore*”. Additionally, as households:

“Haven’t had to buy their own fruit and veg, they have spare money to spend elsewhere on gas and electric.” (B1)

An interesting finding was that the vouchers may be less applicable in certain environments. In Bassetlaw, B1 noted that when offering boxes, the vouchers were “*a bit redundant*” compared to a market stall setup and that an “*invitation through the door*” might have been sufficient. However, this may contradict the core of the scheme, shifting it towards a universal basic service (Bohnenberger, 2020) and creating stigma, akin to the use of means-tested schemes (Bruckner *et al.*, 2021; Barrett, Spires and Vogel, 2024). In contrast, P felt, in Plymouth:

“The vouchers are what make the Fresh Street [scheme], because they don’t discriminate. ... It’s the power of the spend. ... They know what they can get with it. ... That’s definitely a positive attribute.”

The FV voucher’s overall positive perception and impact on FV consumption aligns them with Bohnenberger’s (2020) shift vouchers. Providing means to consume a healthier diet allowed households to reallocate their disposable income to other goods, notably household bills. This finding confirms three theories from the literature. Firstly, mental accounting is used to budget income (Thaler, 1985). Secondly, the vouchers were cash-equivalent as the alleviated disposable income was not used to increase purchasing on less healthy foods, improving overall diet quality, similar to the Healthy Start findings (Griffith, von Hinke and Smith, 2018). Thirdly, it follows Thaler and Sunstein’s (2003) argument that if vouchers align with individual preferences, then their FV-specific nature does not make them paternalistic. This is considered further in the discussion.

Financial Dependence

While the vouchers provide a financial benefit, the ending of the scheme may provide a harsher reality:

“There's an issue with the project coming to an end and suddenly not having that financial incentive anymore, and that's really sensitive.” (P)

“I think that people are almost worse off at the end of the intervention when they've had something for nothing than they are if they're making a small investment. ... I'm not dismissing the vouchers at all, ... somebody has to pick up the cost of the vouchers somewhere, economically speaking.” (P)

R described the funding ending as “*nerve-wracking*” for participants, but also for the organisations. All interviewees noted that the “*resource-intensive*” nature of the scheme is a challenge they faced:

“Finding the money for the vouchers to pay the vendors. That's always a challenge.”(R)

“We'd love to extend the scheme and make it free to everyone, but cost is a limiting factor there.” (B1)

Subsidy Versus Voucher

Although the initial scheme in Plymouth has concluded, the fortnightly market continues to support the community through a subsidy initiative, offering “*5 items for £1*” (P). Communities did not want to lose their progress, having engaged heavily in the scheme, so P notes this subsidy scheme seems “*as interesting to people*” and that participants are “*prepared to pay that small amount*”.

4.1.2.2 Convenience

R stated convenience is “*paramount when you're buying food*”, similar to Thaler and Sunstein's (2022, p. 107) suggestion to first “*Make It Easy*”.

Increased Access

Access was improved through the introduction of pre-packed bags/boxes and/or a market stall. Reading and Plymouth implemented their schemes in food deserts:

Fresh Street Unpacked

"The area that we are working in is slightly removed from the city centre of Plymouth, ... the access to healthy and fresh food in that area is particularly poor." (P)

Whereas Bassetlaw's access challenge was regarding affordability:

"Closing the gap for deprived families, allowing them to have more access to affordable fruit and veg. ... There's a lot of supermarkets in the area, ... accessibility is not really an issue there." (B1)

Pre-packed FV

In Plymouth and Bassetlaw, pre-packed boxes were pre-ordered online, streamlining the delivery process for vendors.

In Plymouth (P), the £5 bags were available fortnightly and collected from the Salvation Army Hall on Thursdays between 10 am and 12 pm. In Bassetlaw (B1), the £10 boxes were collected every Thursday from the community garden. The box collections faced temporal and mobility issues:

"The fortnightly ordering and pick up didn't suit everybody, and that's because we were doing it during working hours. ... We immediately missed all the people who maybe couldn't access what we were offering because they were at work, which could potentially be quite a lot of people. ... Things like transport, carrying the bags, all those sorts of quite practical things were quite challenging." (P)

"They were delivered to the garden, and then people walked up to the garden to collect the boxes. ... There's some people who have mobility issues who just couldn't get up, but this is where we tried to connect neighbours, ... Asking 'would you mind collecting for so and so'. ... We were trying to increase people's physical activity." (B1)

Both experienced neighbours helping each other, but it was interesting that the collection had had a purpose in Bassetlaw. B1 noted they wanted to *"introduce people to the garden"* for future interventions, such as building a BBQ *"to facilitate social eating and cooking"* (B1). In Plymouth, a considered solution to temporal access was to introduce an *"evening version of the pick-up and ordering"* (P), however, the *"resource-intensive"* (P) nature of the scheme made this challenging.

Fresh Street Unpacked

Market Stall

In Reading, the market stall ran every Saturday morning from the local community centre. The vendors controlled how the produce was sold, i.e. pre-priced or by weight. While pre-priced items may increase convenience as participants *“don't have to think about the price... it might be more than or less than what they need”* (R), leading to potential waste. While pre-priced may be more temporally efficient, the stall provided an opportunity for social interaction (R).

In Plymouth, the monthly stall ran on Saturdays, which allowed those who were working to access the scheme:

“It's a Saturday, and I think that was the other thing with the stall. It allowed people who had been working all week to access it.” (P)

Mobile Van

Using current and previous study results, Plymouth plans to implement a mobile van delivery service to three locations, making access *“as convenient as possible for people”* (P). Its introduction in Doncaster significantly increased voucher and household uptake rates (Relton *et al.*, 2025).

FV Quality

High-quality FV aided in scheme attraction. Participants noted better taste and shelf-life compared with supermarkets and other surplus food models:

“One of the big things for our fruit and veg was the quality and how long it lasted... because you don't get that when you're using surplus/end-of-shelf-life food.” (P)

“The veggies were lasting double, if not three times more than the supermarkets... taste as well. He's (the vendor) picked what he would eat. So yeah, to me, tenfold quality.” (B1)

Knowledge and Skills

While awareness of the 5-a-day message was high across all locations, nutritional knowledge and cooking skills were identified as improvement areas, particularly in Bassetlaw:

Fresh Street Unpacked

“Cooking skills is a huge issue in this community as well... the residents don't actually know what to do with a lot of the ingredients.” (B1)

“How to prepare and how to cook the food. ... It's not just about fruit and veg, it's time consuming” (B2)

This skill gap has motivated Bassetlaw to explore introducing the “5-a-day the Budget Way” course in the future. The course is free for benefit recipients and focuses on teaching participants how to prepare healthy, budget-friendly meals. Additionally, Bassetlaw intends to *“provide the ingredients”* (B2) to support participants in putting their learning into practice. Implementing skill-based programs based on identified community needs can help mitigate dissatisfaction and stigma. This approach avoids assumptions, such as presuming a lack of basic cooking skills in lower-income communities (Bruckner *et al.*, 2021).

In Plymouth, knowledge courses included *“how to use what's in the bag”*, *“avoiding food waste”*, and *“how to cook leftovers”* (P). These were also available to control streets in Reading and Plymouth to measure the impact of education on the community.

4.1.2.3 Default Options

The default options in this study consider two aspects: the FV-specific nature of the vouchers and choice availability with scheme delivery, i.e. pre-selected box versus market stall.

FV-Specific Vouchers

The FV-specific nature of the vouchers was positively received by participants, with P noting participants *“liked the novelty”* of the scheme:

“Everybody was really positive about the fruit and veg and that they were getting something for free to boost their nutrition...they all knew they should be eating more fruit and veg. So, this was a perfect opportunity for them to do so.” (P)

These positive perceptions further alleviate paternalistic concerns.

Choice Availability

In Plymouth, choice was preferred by participants, with higher uptake rates seen at the stall compared to pre-packed bags:

Fresh Street Unpacked

“What was really important for us was that when they went to the stall, they could actually choose... They didn’t really have a choice in what was in the bag... The freedom of choice was definitely a bonus part of the market... It saves on waste as well... People really liked being able to choose... They could also pay by card or cash” (P)

Conversely, the pre-packed boxes were preferred in Bassetlaw, B1 felt they *“improved the project because it helped people to use ingredients that they would never have used before”*. The vendor selected the produce, keeping certain regular items, such as *“onions, broccoli, and carrots”* (B1), but also making feedback-based changes. For example, salad items were added to a mixed box after one resident requested them (B1).

4.1.2.4 Framing

Raising awareness and clearly explaining the scheme’s intentions were paramount to its success. In Plymouth, the involvement of CFRs helped identify the community’s specific needs before scheme implementation. Door-knocking proved to be the most effective method for promoting the scheme. R noted that, initially:

“Only a quarter of people will be in and willing to open their doors and listen to some stranger talk about vouchers for fresh fruit and veg.”

In contrast, in Bassetlaw, B1 said they thought door-to-door knocking would be a *“2-minute doorstep conversation”* but that it:

“Turned into huge conversations with people about huge impacts, you know, huge things going off in their lives and things like that... I didn’t realise the impact the door knocking would have.”

However, this was initially more challenging in Bassetlaw, as many participants were from ethnic minorities, causing an unexpected language barrier (B1 and B2).

“Word of mouth” (R) was the next most effective method, relying on neighbours to share the scheme’s intentions and make people aware that they had vouchers they could use. The recipes delivered with the vouchers provided a significant talking point

between households. In Reading, R felt they had “*more impact*” than initially expected, especially in terms of “*get[ting] people talking and thinking about food*”.

Framing to Reduce Stigma

While stigma is hard to measure directly, R noticed stigma through participants rejecting the vouchers, with some not “*want[ing] to be seen as poor*”, or saying “*that’s not for me*” or “*they’ve picked the area because we’re poor*”. While P stated that the “*giveaway*” aspect may create a stigma akin to “*accessing food banks and other emergency food aid*” and be “*a pride thing*”.

The uptake rate of the vouchers may be a good stigma proxy measure, i.e. the 75-90% uptake shows most households used the vouchers or at least shared them with others.

4.1.2.5 Social Norms and Connection

The most significant finding was the extensive social connection created by the scheme. The social connection links with social norms as individuals consider “*what does everybody else do?*” (R) and how “*society and societal approval*” (R) influence their behaviour.

In the long-term, the Plymouth and Bassetlaw representatives felt that the social benefits would exceed the increased FV consumption due to the loss of the vouchers:

“*You are giving people the opportunity and nudging them in the [right] direction, ... but if you’re not continuing it, what then happens, ... you’re back to square one.*” (P)

“*Whereas the social connectedness aspect of it, I think, will have better impacts than the fruit and veg improvement plan.*” (B1)

Connection

R’s objectives for the scheme centre on enhancing diet quality, combatting chronic illness and obesity, fostering community and household bonds (“*knitting communities and families together*”), strengthening connections with food, and advancing the UK’s food systems.

Fresh Street Unpacked

"I'm just always really interested in anything which connects people, in a healthy way, to each other and the land they live on and the air they breathe and the food they eat and just connecting because we are so fragmented. " (R)

"We've got a whole food industry which is designed to make you not think about food, ... It's actually [about] getting people thinking about food and actually cooking." (R)

P found the social connection to be *"the most interesting bit"* for them. Previous community projects meant the CFRs were already integrated into the community and *"were actively engaged in the setup and delivery"* (P). The CFRs saw *"people coming out that previously really hadn't come out and engaged in things"* (P). Additionally, Plymouth residents identified low FV access to the CFRs:

"We did a lot of pre-community work and action research in the community to identify issues, and the communities came up with the fact that vegetables were something that they were really interested in" (P)

In Bassetlaw, they connected many residents to local support services, such as *"financial support for employment"* (B2):

"We worked with other sector organisations to facilitate the scheme, and we also wanted to make them (the residents) aware of further support that is available through those organisations" (B2)

By the end of the scheme, B1 *"felt part of that community"*, and B2 felt they *"lived there"*. Additionally noting:

"The relationships that some of the households have built up with their neighbours over the scheme is massive. ... It's really built a community" (B1)

Sharing Vouchers

The sharing of vouchers instigated social connection. The paper format of individual £1 vouchers was designed to facilitate sharing between households and was actively promoted. In Plymouth and Bassetlaw, neighbours offered to collect bags for those who were not able to:

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“People came in and took away like 10 bags, and they were giving them to other people.” (P)

“He took two boxes, and he batch cooked vegetable soup and then he took it to all of the old folks bungalows behind him. ... ‘I don’t want it to go to waste’.” (B1)

“She was better off than the average person [in the area], and she was a teacher at the local school. So she took in her vouchers and gave them to kids, who then gave them to their parents, who then used them at the store.” (R)

Engagement Initiatives

The engagement initiatives not only increased knowledge and skills but also facilitated social connection. Some classes involved parents and children in Plymouth, and R noted these initiatives helped to *“make the offer more attractive”* (R).

These activities included “basic cooking skills” (R), “*composting workshops*” (P), discussions around the “*nutritional value of different fruit and veg*” (P), “*how to use what’s in the bag*” (P), and classes involving parents and children (P).

4.1.3 Long-Term Sustainability

All representatives noted that long-term sustainability is a challenge as it is “*resource-intensive*”, from delivering the vouchers to “*paying the vendors*” (R). To reduce costs, the schemes have adapted their delivery methods:

- **Reading:** The recipes have stopped, and vouchers are now collected from the local community centre to “*minimise overheads*” (R). This “*seems to be working quite well*” (R).
- **Plymouth:** P discussed their move to a subsidy scheme to maintain prices below local supermarkets; their subsequent work indicates a positive reception.

Intervention area size is another challenge. In Bassetlaw and Plymouth, “*tension[s]*” arose with residents who live next to the intervention area as they felt it was “*unfair*” that they were not eligible (P and B1). This is particularly evident in Bassetlaw, where the intervention is a section of one street, meaning some live only “*two households away*” (B2).

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In Bassetlaw, the vouchers were described as financially “*putting a sticking plaster over the gap*” (B1) for many households, but without vouchers, P worries behaviours will go back to “*square one*”. Maintaining engagement has been noted as particularly important so as not to lose “*an enthusiastic group of people*” (P) as they are key to the next iteration’s success.

Finally, perceptions of effective scheme length varied. In Bassetlaw, B1 and B2 felt the 30-week period was long enough to create positive community effects, while in Plymouth, P felt that 10 months was “*nowhere near long enough*” as they “*were just getting momentum going*” and felt they “*could have done with the same amount of time again*”. In Reading, the scheme was extended by Reading Borough Council as they “*were really pleased with seeing the impact*” (R).

Ethical Considerations

Ethical considerations are crucial for long-term sustainability. Providing financial support for a set period may induce reliance and make households worse off in the long term. A subsidy scheme alleviates financial constraints but asks households to invest in their well-being.

“If you give things for free, once the project ends it’s a bigger knock to people than it is if you’re kind of effectively subsidising in some way. ... I think the notion of low-cost fruit and veg that’s available at a lower cost than what they can pay in the local area, I think would still be attractive from what we’ve found through some of the subsequent work.” (P)

4.2 Discussion

Applying findings from these interventions to the nudge framework identified why each element contributes to the scheme's effectiveness. These findings address the research questions, offering practical insights for future interventions.

Identified Barriers

RQ1: *What factors contribute to the intention-behaviour gap in FV consumption among participants of the Fresh Street initiative?*

Cost, access, knowledge, and skills were identified as barriers to FV consumption, aligning with the literature (Caldwell *et al.*, 2009; Munt, Partridge and Allman-Farinelli, 2017; Wolfson *et al.*, 2019).

Vouchers

RQ2: *How do Fresh Street's food vouchers influence participants' purchasing and consumption behaviours of FV?*

Cost emerged as the most significant barrier, underscoring the need for financial incentives. These findings support literature showing that FV vouchers boost spending and that financial incentives initially nudge FV consumption, particularly in lower-income communities (An, 2012; Li, Zhang and Pagán, 2016). £1 paper vouchers empowered participants by functioning like cash, contrasting Healthy Start voucher perceptions (Barrett, Spires and Vogel, 2024).

While voucher value varied across the three locations – £10 fortnightly in Plymouth and £10 weekly in Reading and Bassetlaw – daily (self-reported) FV consumption did increase 40-50% after the scheme (Figure 4), significantly higher than the 15% seen in other dietary nudge interventions (Arno and Thomas, 2016).

The long-term sustainability of providing financial assistance is crucial, a similar US scheme reported that over 40% of participants felt more stressed about affording nutritious meals post-intervention (Dailey *et al.*, 2015). To mitigate this for Fresh Street, Plymouth's subsidy may provide a viable long-term solution or ease the transition from vouchers. However, for long-term dietary improvements, financial incentives must be coupled with other initiatives, such as education.

The Use of Nudge Theory

Breaking down the Fresh Street scheme into components within a nudge framework revealed its elements' contributions to effectiveness, answering the final research question:

RQ3: To what extent are the propositions of nudge theory useful in the design of Fresh Street's FV-specific food voucher scheme?

Convenience and Access

The explicit recognition of access as a barrier by Plymouth residents and their subsequent increase in FV consumption within the scheme suggests it contributed to their IB gap.

Previous interventions, such as Doncaster, indicated that public transport costs reduced voucher uptake, undermining the financial incentive and highlighting the need for proximity (Relton *et al.*, 2025). Implementing a market stall enhances structural access for the whole community and supports long-term dietary improvements. Similarly, Caldwell *et al.* (2009) found that better food access improved post-intervention healthy habits.

A weekend or evening mobile van could effectively address temporal and mobility access barriers. While this solution may require significant resources and pose challenges in finding vendors available at these times, the engagement of vendors in the scheme has already increased their sales, suggesting they may be open to trialling new approaches.

Default Option Versus Choice

An interesting finding was the differing perceptions of the pre-packed (default) option. The status quo bias may explain Plymouth's preference for choice versus Bassetlaw's for the pre-packed option.

The Plymouth residents identified geographic access as a challenge, suggesting they lacked external choice availability. Conversely, Bassetlaw did not face geographic barriers, insinuating that external choice is available. Proposing the availability of external choice may be a pivotal factor in shaping the default's perception and effectiveness. When individuals have access to other food provisions (i.e. Bassetlaw), they may prefer the pre-selected box as it minimises choice, reducing cognitive

overload. Whereas when other choice is not available (i.e. Plymouth), the pre-selected option feels restricting, causing lower demand.

This distinction suggests that an element of paternalism may exist in the scheme's delivery method, however, this may be tempered by the shared goal of improving diet quality between the scheme and recipients (Thaler and Sunstein, 2003). The Bassetlaw vendor's feedback-based adjustments to the boxes, like adding salad options, may have boosted appeal through participant involvement (Bruckner *et al.*, 2021).

This finding offers practical considerations for determining future scheme delivery styles.

Knowledge and Skills

Representatives expressed concern that, without vouchers, FV consumption would revert to pre-intervention levels, though some literature argues otherwise. Increasing self-efficacy through cooking skill courses and nutritional education can help build long-term habits that can help individuals turn their intentions into behaviours (Garcia *et al.*, 2014; Hidrobo *et al.*, 2014). The positive responses from participants regarding their mental and physical health should also suggest that behaviours will not revert back, similar to Gardiner and Bryan (2017).

Social Norms and Community

The extensive social connection within the community was a prominent finding, though not unique to this study. Social connection was also a key finding in farmer's market-specific food voucher schemes in the USA (Dailey *et al.*, 2015) and Canada (Caron-Roy *et al.*, 2021).

This finding proposes that changed social norms may enhance long-term benefits and sustainability. Healthy Options showed that socialising and sharing information, like recipes, extended beyond the scheme (Dailey *et al.*, 2015).

Although nudges are often most effective in short-term interventions, combining nutritional education with social connection improves long-term dietary habits (Munt, Partridge and Allman-Farinelli, 2017). The social cooking initiative aim in Bassetlaw

will provide a regular social activity, allowing communities to come together and share food, recipes and stories, reminding individuals they are not alone.

These findings underscore the role of community initiatives in fostering self-efficacy and lasting impacts.

Framing and Awareness

Door-knocking was the most effective at raising awareness through its trickle-down effect from representatives to neighbours. Observability framed the scheme positively, as seeing others use the vouchers and interact with the scheme alleviated stigma.

Despite its resource demands, door-knocking proved essential for understanding community concerns and connecting residents with other services they were previously unaware of.

4.3 Chapter Conclusion

This chapter presented the findings from the interviews with Fresh Street representatives. By deconstructing each element of the scheme and categorising them within the nudge framework, this research examined the effectiveness of Fresh Street and offers practical solutions for future interventions. Overall, the scheme increases FV consumption within areas of high deprivation, but this study highlighted the extensive range of other benefits. While food voucher schemes face long-term sustainability challenges without consistent funding, community engagement offers hope for improved behavioural changes.

5. Conclusion

5.1 Overview

This dissertation set out to examine whether Fresh Street's food vouchers effectively reduce the intention-behaviour gap in fruit and vegetable consumption in the UK, and if so, how. To understand the underlying mechanisms, each intervention was deconstructed and applied to the five nudge theory concepts: financial incentives, default options, convenience, social norms, and framing (Thaler and Sunstein, 2008). Nudge theory was selected due to its proven efficacy at improving dietary behaviours, in particular, increasing FV consumption (An, 2012; Arno and Thomas, 2016; Friis *et al.*, 2017). Extensive research exists on individual nudge components, but combining these five concepts into a framework was a novel approach.

In the UK, three food voucher schemes exist to alleviate the financial barriers to consuming a healthy diet, particularly in lower income groups, where the share of those meeting the 5-a-day guideline is significantly lower (Wolfson *et al.*, 2019; DEFRA, 2024). Of these, Fresh Street is the only non-means-tested, place-based scheme, which aims to improve diets at a community level by offering vouchers to all households; to the best of the researcher's knowledge, this combined approach makes it the first of its kind globally.

This study found that improved access, reduced financial barriers, enhanced food-related knowledge and skills, and increased social connection were the main contributors to reducing the IB gap in FV consumption within these communities. The theoretical and practical applications of these findings are presented below.

5.2 Theoretical Contributions

This dissertation offered an integrative perspective on nudge theory by retrospectively applying its core concepts to the Fresh Street case study. Although the effectiveness of individual nudges – financial incentives, default options, convenience, social norms, and framing – have been extensively researched, synthesising them into a comprehensive framework is a novel approach. The findings demonstrate how these elements interact within a food voucher scheme, revealing the key drivers of behaviour

in this context. This integrative framework not only deepens the theoretical understanding of nudge strategies in public health interventions but also provides a practical lens for enhancing future policy design and evaluation.

The barriers to FV consumption identified within these lower-income communities mirror those found in the literature: cost, access, knowledge, and skills (Munt, Partridge and Allman-Farinelli, 2017; Wolfson *et al.*, 2019). This study's contribution to the nudge literature pertains to the idea that coupling nutritional education with financial incentives increases their overall efficacy (An, 2012; Betty, 2013; Li, Zhang and Pagán, 2016). It also contributes that when good-specific vouchers align with personal preferences, paternalistic concerns are mitigated, as argued by Thaler and Sunstein (2003).

Finally, this research finds that shift vouchers do increase the consumption of the desired good (Bradford and Shaviro, 1999; Bohnenberger, 2020), and the alleviated disposable income is not reallocated to less healthy foods, similar to Griffith, von Hinke and Smith's (2018) finding.

5.3 Practical Contributions

This research provides practical contributions for future Fresh Street interventions and similar food voucher schemes. The variation in delivery styles across the three interventions provided depth to this integrative framework approach by highlighting the need to categorise individual components of the scheme to measure their effectiveness. This nudge framework allowed the researcher to better understand the underlying mechanisms at work within Fresh Street interventions.

The variation in preferences between the market stall and a pre-packed box suggests that when other food provisions are available, households may prefer the pre-selected option to reduce decision-making. However, when households lack access to other food provisions, they prefer to choose their own produce, such as at a market stall. This provides an important consideration for future scheme designs.

The main challenge of such food voucher schemes is their resource-intensive nature, both temporally and financially. Paying the vendors and community food researchers is expensive, but delivering the scheme also requires a lot of their time. The door-to-

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door knocking was noted as particularly resource-intensive, but it was perhaps the most important for understanding community needs and raising scheme awareness. The collection of vouchers from the community centre in Reading appears to be working well and has reduced their overheads. While the effect on uptake is unclear, this is a potential long-term solution and may continue to drive engagement with the centre.

Delivering a scheme that is convenient for the residents and organisations is challenging when working hours collide, but continually improving the scheme with participant feedback can help long-term sustainability.

Policy Implications

Increasing consumption of FV is linked to reduced cardiovascular disease, cancer, and overall mortality (WHO, 2020). This research has shown that providing healthy food-specific vouchers can increase the purchasing and consumption of FV, improving diet quality and offering mental and physical health benefits, hence proving an important area for policy intervention.

The responsibility to meet the 5-a-day guideline often falls on individuals (Munt, Partridge and Allman-Farinelli, 2017), however, these findings suggest that structural barriers may play a larger role than previously anticipated.

Fresh Street predominantly relies on research funding, but its feature in DEFRA's latest Food Security Report and its recent successes in Reading, Plymouth and Bassetlaw provide evidence for long-term national funding. Reading Borough Council's investment into extending the vouchers in Reading further strengthens this.

Despite its smaller scale, Fresh Street's higher uptake may indicate that Healthy Start could learn from these insights. Although Healthy Start addresses financial and dietary needs for young families (McFadden *et al.*, 2014), the lack of data on eligibility and uptake since January 2023 raises management concerns (DEFRA, 2024).

The implementation of a subsidy scheme may provide a lower cost alternative for policy-makers, but its effectiveness within the Fresh Street scheme is yet to be studied.

5.4 Limitations and Future Research

The focus on Fresh Street provided an in-depth analysis of this unique food voucher scheme, contributing to its limited existing research. Conducting interviews with

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representatives across three locations provided comparative perspectives, however, a few limitations persisted. This exclusive focus may limit this study's generalisability as findings may not be directly applicable to other food voucher schemes or public health interventions, but it aims to provide in-depth insights into why each nudge concept is effective. The UK focus may also limit its generalisability in other contexts; however, if similar community barriers are identified, these findings could help offer design insights.

As interviews were only conducted with Fresh Street representatives, there is a possibility of advocacy bias, where their interest in the scheme may skew responses to emphasise positive aspects (Olson, 2022). However, as Fresh Street itself is part of a research project and conducting feasibility studies, representatives were willing to share their retrospective views on potential areas for improvement, mitigating this bias. Additionally, the small sample size may limit diversity; however, the holistic view provided by these representatives over each intervention's duration and their involvement in the scheme provided a collation of perspectives and experiences.

This study combined five concepts from nudge theory to create a framework to understand Fresh Street's effectiveness. Despite each component being widely studied in many contexts, their combination is a novel approach, particularly within food vouchers. Their integration may mask the influence of each other or external factors, so this framework only provides a collective understanding of these concepts.

Future research could use this framework to understand how and why the scheme works from the household perspective. This may further explain why differences in preferences arose, providing actionable insights for future schemes.

Additionally, a mixed-methods approach may provide further validity to this approach; combining longitudinal data with qualitative interviews could help to understand how and why behaviours change during and after the scheme. Follow-up data will be collected by Fresh Street 12 months after the interventions end, so future research could analyse the long-term impact of this scheme.

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Appendix

Appendix 1: Interview Guide

Scheme Overview

1. What does the Fresh Street scheme represent/mean to you?
2. What have been the main successes of the scheme? and unexpected successes?
3. What have been the main barriers to the scheme? Any unexpected barriers?
 - Were there any challenges in the delivery of the scheme?
Probe: With vendors, volunteers, voucher delivery etc.
4. What do you think causes low FV consumption in the UK?

Financial incentives

5. What challenges did Fresh Street Plymouth/Reading/Bassetlaw experience with voucher use from a financial point of view?
Probe: At both the individual and scheme level
6. How important do you think the financial aspect has been in changing FV consumption behaviour/ encouraging FV consumption?

Default options

7. Do you think the FV-specific aspect of the vouchers was impactful?
8. What were its intended benefits?
9. How were the boxes received by households vs the market stall?
10. How does the Fresh Street scheme compare to Healthy Start?

Social Norms:

11. Do you think the social standards for FV consumption have changed in Plymouth?
12. Has this had a knock-on effect for increasing consumption or scheme awareness?
13. How has the social aspect impacted communities?
Probe: Was this expected? How has it evolved?

Framing

14. Can you share any examples of successful messaging campaigns or techniques used in the initiative?
 - What nutritional information was shared regarding FV consumption (i.e. its benefits)?
15. Did you hear households discussing the recipes?

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Probe: How were they perceived?

16. Would you change anything about the way information was delivered?

Convenience

17. What methods were used to increase access to FV?

- How much influence do you feel convenience has in FV consumption?
- Did increasing the convenience through a market stall help this?

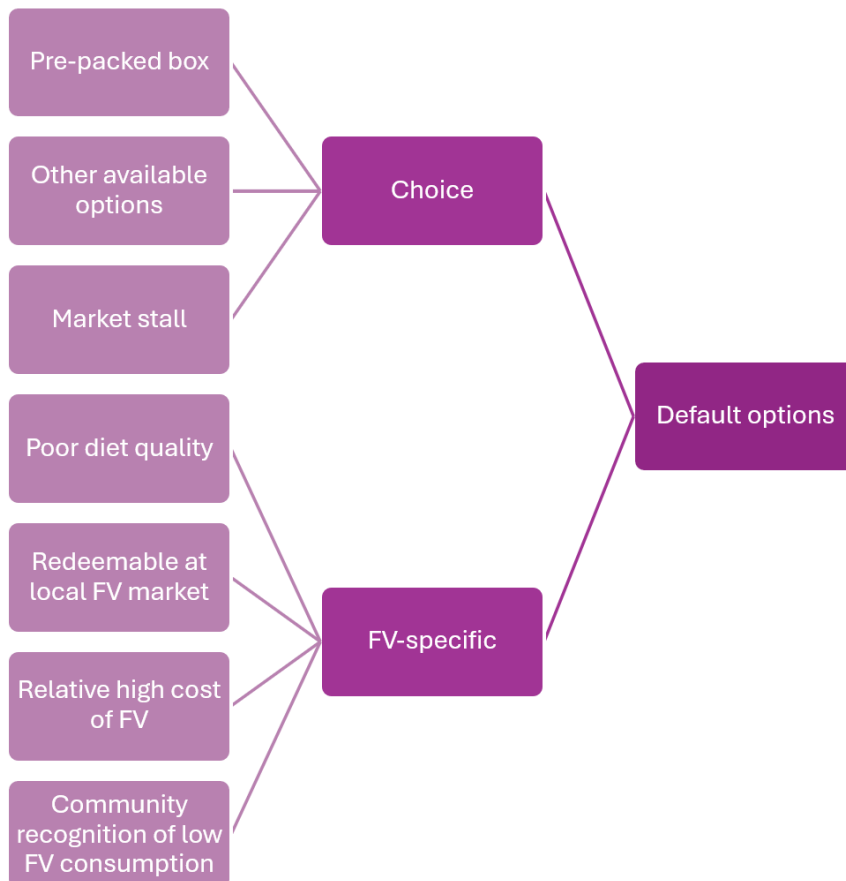
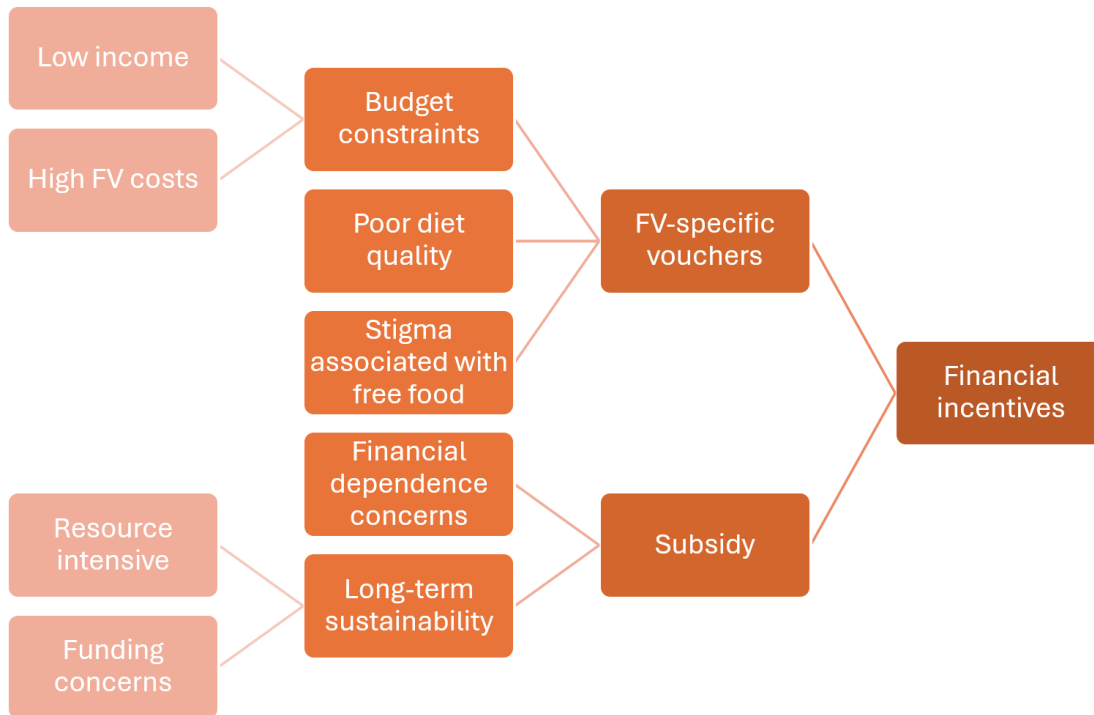
18. What would you change to increase convenience/future improvements?

Future Plans

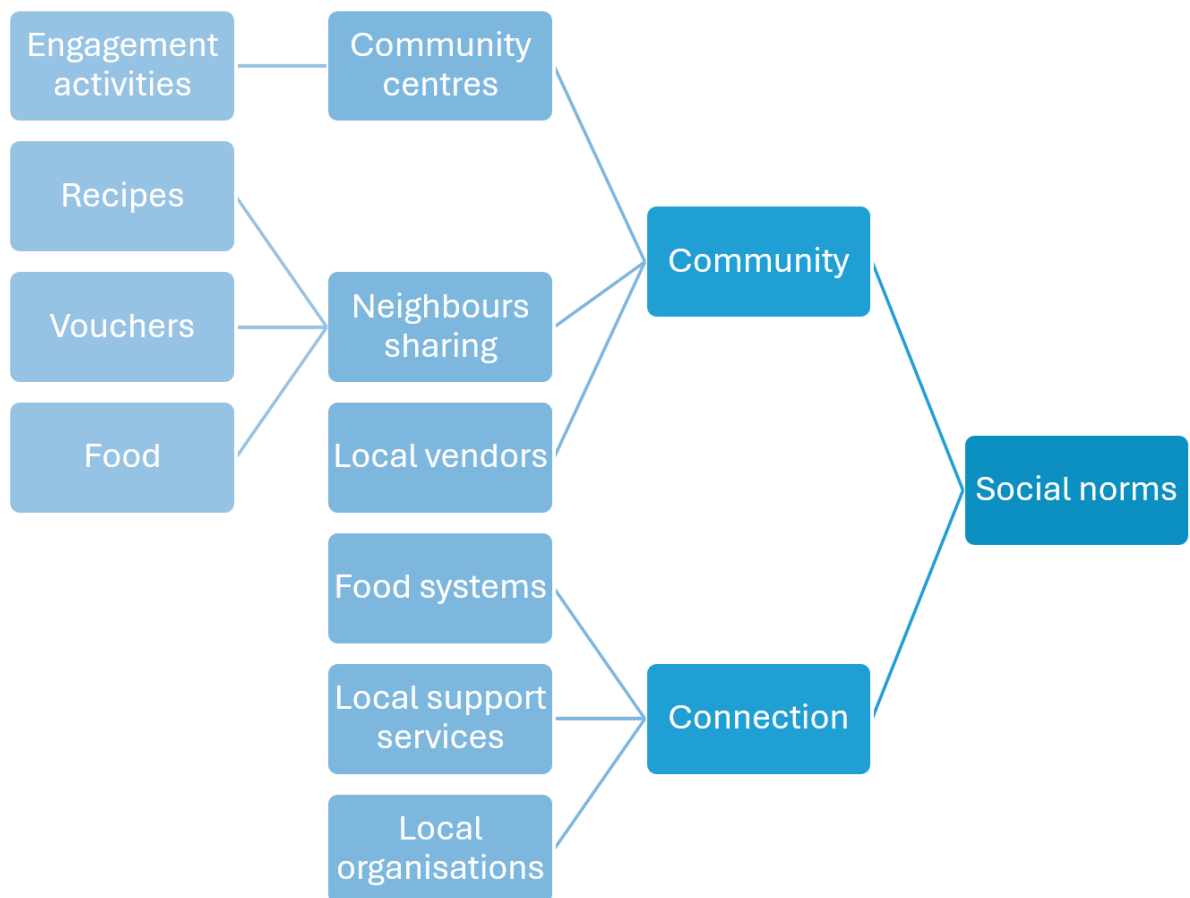
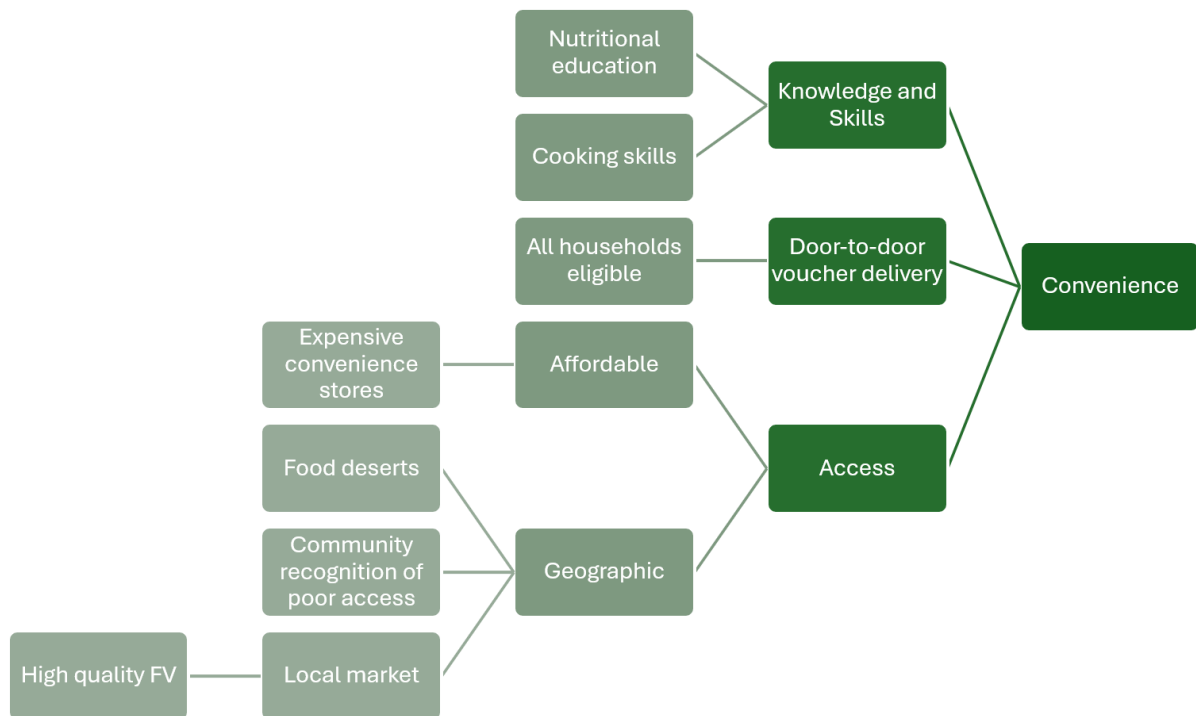
19. What plans do you have for the future of Fresh Street or Plymouth?

20. Is there anything else you would like to share about the initiative and its impact?

Appendix 2: Coding Charts



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