Litter, gender and brand: The anticipation of incivilities and perceptions of crime prevalence

Abstract

This paper isolates litter as a physical incivility in a film-based experiment, demonstrating the impact of litter on participants' anticipation of a wide range of both physical and social incivilities, and on their perceptions of crime prevalence. Such relationships have not previously been examined, partly because litter has rarely been the focus of earlier studies on incivilities. This paper also tests for possible interaction effects in these relationships involving gender (finding no significant interaction), as well as examining whether there is a difference in the anticipation of incivilities and perceptions of crime prevalence between participants exposed to branded as opposed to unbranded litter (finding no difference between the two groups). Litter is often viewed as a tolerable nuisance; and not always treated as a priority. This study suggests prioritising funds towards more targeted interventions to reduce litter might result in some 'quick wins' – most notably, reducing perceptions of crime prevalence.

Keywords: litter, incivilities, perceptions of crime, gender, brand, packaging, experiment

1. Introduction

Litter has a broad environmental impact (Nellemann & Corcoran, 2009; Sheavly & Register, 2007), and can also affect human perceptions of the spatial environment in which it is present. In this sense, litter is a 'physical incivility'; a term capturing a range of "low–level breaches of community standards that signal an erosion of conventionally accepted norms and values" (LaGrange, Ferraro, & Supancic, 1992, p. 312). Alongside litter, physical incivilities can include graffiti, vandalism, and vacant or dilapidated buildings (LaGrange et al., 1992; Perkins, Meeks, & Taylor, 1992). These differ from 'social incivilities', which may similarly affect perceptions of space, and include anti-social behaviour, begging, gangs of youths, and drug or alcohol abuse (LaGrange et al., 1992; Perkins, Florin, Rich, Wandersman, & Chavis, 1990; Rohe & Burby, 1988). Other synonyms for incivilities have been used, such as 'disorder' (Doran & Lees, 2005; McGarrell, Giacomazzi & Thurman, 1997; Skogan, 1990; Sampson & Raudenbush, 1999; Toet & van Schaik, 2012; Wilson & Kelling, 1982) and 'cues to danger' (Warr, 1990).

In the USA, social unrest in the 1960s, and flight from major urban centres (Garreau, 1991), led to renewed concerns about crime and fear or crime in an urban context, and the reasons behind the apparent rise in these phenomena (Wilson, 1968; Biderman & Reiss, 1967). It is suggested (Ditton & Farrall, 2000; Lee, 2007) that a key socio-political influencing factor for these concerns was the President's Commission on Law Enforcement and the Administration of Justice (1967), which highlighted how crime was affecting US citizens' quality of life. Of relevance to our paper, in discussing problems of 'slum areas' as the most crime-ridden places, this report identifies "trash around the street" and "yards… littered and dirty" (ibid. p. 61-62) as a symptom of decay, implying a connection between the physical incivility of litter and crime.

Research on incivilities (both actual and perceived), including litter, debris or garbage, and their relationships with various crime-related measures, developed throughout the 1970s (Hunter, 1978), 80s (Gates & Rohe, 1987; Lewis & Maxfield, 1980; Lewis & Salem, 1986; Maxfield, 1987; Rohe & Burby, 1988; Skogan & Maxfield, 1981; Taylor & Hale, 1986; Taylor, Shumaker, & Gottfredson, 1985), 90s (Covington & Taylor, 1991; LaGrange et al., 1992; McGarrell et al. 1997; Perkins, Wandersman, Rich & Taylor, 1993; Sampson & Raudenbush, 1999; Skogan, 1990) and beyond (Brown, Perkins, & Brown, 2004; Doran & Lees, 2005; Hur & Nasar, 2014; Pitner, Yu, & Brown, 2012; Toet & van Schaik, 2012). Particularly influential in this canon of literature is Wilson and Kelling's (1982) 'broken windows' thesis (see also Kelling & Coles, 1997), suggesting incivilities lead to spatial environments in which crime is more likely to occur and be feared. However, as discussed later, this thesis has received mixed support.

Almost all research on incivilities and their potential links to crime-related measures tends to aggregate incivilities, rather than examining them individually (see, for example, Doran & Lees, 2005; LaGrange et al., 1992; McGarrell, et al., 1997; Pitner et al., 2012; Sampson & Raudenbush, 1999). By contrast, the primary aim of our paper is to establish via experiment, if i) people's anticipation of incivilities in a given space and, ii) people's perceptions of crime prevalence, are directly affected by being exposed to just one incivility - *litter*. The reasoning is that if litter alone is found to affect these other variables, then it is an incivility that is relatively easy to fix. No other studies have isolated the litter effect in an experimental manner.

A secondary, but no less important aim of our paper is to identify factors that may influence relationships between litter, anticipation of incivilities and perceptions of crime prevalence, such as gender. Previous work on the impact of gender upon the anticipation of incivilities is inconclusive (Greenberg & Schneider, 1995; LaGrange et al., 1992; Skogan &

Maxfield, 1981). There is an oft reported effect of gender upon risk perception and fear of crime (Atkins, 1989; Hale, 1993; LaGrange & Ferraro, 1989) – although the reasons for this are identified as complex and multi-dimensional (Franklin & Franklin, 2008; Gilchrist, Bannister, Ditton, & Farrall, 1998; Smith & Torstensson, 1997; Stanko, 1995; Sutton & Farrall, 2005). If men and women perceive litter differently, could this also relate to different gender perceptions of crime prevalence?

Equally, we investigate for differences in the anticipation of incivilities and perceptions of crime prevalence between participants exposed to branded as opposed to unbranded litter. The reasoning is that the majority of litter comprises the branded packaging of fast-moving consumer goods (Roper & Parker, 2006, 2013). Such packaging typically communicates using prominent designs (Keller, 1993; Underwood & Klein, 2002), meaning it may be more noticeable as litter than unbranded packaging. In turn, litter that is noticed more could feed through to affect the anticipation of incivilities and/or perceptions of crime prevalence. Such findings may have implications, in terms of making brand owners play a more active role in litter clearance, overcoming corporations' attempts to distance themselves from any problems litter creates (Rogers, 2006).

These aims are met via hypotheses development and testing that draws on a film-based, experimental study involving 662 participants. Our paper first identifies these hypotheses by reviewing research on the relationships between litter, incivilities and crime-related measures. This includes discussion of the potential importance of gender and the prominence of branding on litter in these relationships. The remainder of our paper moves through the stages of methodology, findings, and discussion and conclusion, where a fourfold contribution is identified. In brief, i) we provide evidence of a causal relationship between litter and both anticipation of incivilities and perceptions of crime prevalence; ii) we demonstrate the importance of litter as an 'actual', as opposed to 'perceived', incivility; iii)

we contribute to on-going debates regarding gender and perceptions of crime; and iv) we identify why it would benefit brand owners and businesses to clear litter up. Overall, our work indicates that litter should be a higher priority for municipal authorities, police and the business community.

2. Litter, incivilities and crime-related measures

The potential importance of litter as an incivility is captured in the following quote, attributed to Wilson and Kelling (1982):

> "Consider a building with a few broken windows. If the windows are not repaired, the tendency is for vandals to break a few more windows. Eventually, they may break into the building, and if it's unoccupied, perhaps become squatters or light fires inside. Or consider a sidewalk. Some litter accumulates. Soon, more litter accumulates. Eventually, people start leaving bags of trash from take-out restaurants there or breaking into cars." (Lott, 2007, p. 149)[1]

The quote emphasises an apparent sequencing in Wilson and Kelling's (1982) broken windows thesis, which others similarly interpret as a 'cycle' (Doran & Lees, 2005) or 'downward spiral' (Perkins et al., 1992). This perspective implies that a few seemingly minor physical incivilities fixed at source (i.e., broken windows repaired or litter cleared) can deter a further escalation of incivilities (especially social), and subsequently crime and fear of crime (Doran & Lees, 2005). Conversely, ignoring minor physical incivilities can lead to gradual deterioration of an area as it may become perceived as 'indefensible' (echoing Newman, 1972). This may result in 'collective avoidance areas' (Doran & Lees, 2005), where there is a perceived (though not necessarily actual) absence of visible and active law enforcement. These provide a spatially legitimating environment for the perpetrators of

[1] Lott (2007) along with others (e.g. Waltke, 2008) presents this quote as originating from Wilson and Kelling's 1982 publication in The Atlantic. The article itself does not contain this quote verbatim, however it does allude to it 'in spirit'.

incivilities and, ultimately, criminals - although CCTV may alter the dynamics of this (Atkinson, 2003; Fyfe & Bannister, 1996).

Whilst Wilson and Kelling's (1982) broken windows thesis has been influential, it has, as noted above, received mixed support. Broad corroboration comes from work demonstrating links between incivilities (disorder) and various crime related measures, such as perceptions of crime, fear of crime and crime rates (e.g., Perkins et al., 1992; Skogan, 1990). By contrast, other research (Sampson & Raudenbush, 1999, 2001) argues that the structural characteristics of neighbourhoods (most notably poverty) and human behaviour (particularly 'collective efficacy' in the form of residential cohesion) work jointly and reciprocally to affect both crime and incivilities, emphasising the complex and multidimensional nature of any interrelationships between such phenomena, however they are measured.

Numerous researchers investigate litter, both actual (typically assessed by trained raters) and perceived (typically assessed via resident surveys), as part of a battery of incivilities (or disorders), that might be linked to various crime-related measures (including, *inter alia*, police and self-reported crime, fear of crime and perceptions of crime[2]) and, in some cases, measures of neighbourhood satisfaction.

LaGrange et al., (1992, p. 317) uses nine items to measure 1,101 respondents' perceptions of neighbourhood disorder, including 'trash and litter lying around your neighbourhood'. From these nine items, a measure of physical incivility is created (trash and litter, loose dogs, vacant houses, abandoned cars) with a reliability coefficient of .63. Trash and litter is the third most bothersome incivility (after loose dogs and unsupervised youth), indicating 'variation in the incivility indexes' (ibid., p. 318). Litter is not isolated as an individual physical incivility item. Instead, regression analysis demonstrates physical

[2] The terms 'fear of crime' and 'perceptions of crime' are identified in the literature as different concepts with complex interrelationships (see, for example, Farrall, Jackson & Gray, 2009; Hale, 1996 and Jackson, 2011). In this paper we adopt the term 'perceptions of crime prevalence' for reasons explained in our method.

incivilities, risk of crime, and a number of socio-demographic variables, together explain higher levels of fear of crime. (R^2=.38). Physical incivilities as a group are shown to correlate with risk of crime (β = .21., p<.001), but not fear of crime (β = -.02, p=n.s).

McGarrell et al., (1997) tests a number of facilitators and inhibitors to fear of crime, through a self-administered survey completed by 1,134 respondents. Based on a model, which relates perceived social and physical disorder to fear of crime (e.g. Gates & Rohe, 1987), litter (garbage) is included in a scale of disorder, which is found to be a strong 'facilitator' of fear of crime (p<.001). However, it is unclear how much of this disorder is explained by litter. The disorder scale has a reliability coefficient of .86, but includes eight other physical and social incivility items (people drinking in public, groups of teens hanging out and harassing, youth gangs, people using illegal drugs, vandalism, decay, noise and drunk drivers). Similarly, Pitner et al., (2012) conduct survey research with 122 respondents, finding a positive relationship between physical incivilities and neighbourhood safety concerns. The six physical incivilities, which include litter (debris), are examined together, meaning we cannot tell how important litter is in explaining people's assessment of other incivilities or how safe they feel.

Unlike the studies already discussed, Brown et al. (2004) measure actual (assessed by raters) rather than perceived incivilities, finding them to be important predictors of crime (police and self-reported) in 58 neighbourhood blocks. Here, eight physical or 'home incivilities' include 'litter and peeling paint', with a reliability coefficient of .69. As in previous studies, litter is not isolated in the subsequent analysis; thus, it is unclear if, on its own, it has a significant impact upon crime. Likewise, Sampson and Raudenbush (1999) include litter (garbage/litter), both observed by raters and self-reported by residents, as part of their study of disorder, finding a weak relationship between disorder and crime rates. Once again, however, litter is not isolated. Taking a different methodological stance, Toet and van

Schaik (2012) undertake an experiment involving 120 participants to explore relationships between signs of disorder (in real and virtual settings) and participants' concern for personal safety (fear of crime). Their work suggests that signs of disorder (which include litter) do not inspire concern for personal safety. Again, litter is not isolated in the examination of this relationship.

Perkins et al. (1990) survey 1,081 inhabitants of 47 city blocks, measuring fear of crime, block satisfaction, actual and perceived incivilities, and perceived and reported crime problems. Actual physical incivilities, including litter, are assessed by raters. Perceived incivilities, also including litter, are determined through resident surveys. Actual litter is not correlated with perceived incivilities, thus there is no observed relationship between the amount of litter assessed by raters and that perceived by residents. Actual litter is correlated to block satisfaction (r = -.25, p< .01) and fear of crime (r = .25, p< .01). There is also a strong correlation between perceived incivilities and perceived crime (r = .63, p< .001). However, a criticism of this work is that there is a time disconnect between the two aspects of measurement; with actual litter being assessed by raters some months *after* residents' perceptions of crime and litter are surveyed. More recently, Hur and Nasar (2014) employ structural equation modelling, to measure the association between litter (again assessed by raters) and perceived safety from crime, as well as overall neighbourhood satisfaction, for 299 residents (via a survey). No relationship between litter and perceptions of safety from crime is found. However, as in Perkins et al.'s (1990) study, residents' perceptions are measured *before* the amount of litter is assessed.

Finally, Perkins et al., (1992) demonstrate significant correlations between litter, assessed by raters across 50 residential city blocks, and residents' subjective perceptions of physical incivilities, including litter (r = .74), vandalism (r = .34), dilapidated exteriors (r = .69), vacant housing (r = .55) and trashed lots (r = .73). In line with their earlier 1990 study,

they also identify a significant correlation ($p<.05$) in the same 50 blocks between the raters' assessed measure of litter and residents' perceptions of social incivilities (street harassment r =.54, loitering teens r =.57, people fighting r =.69) and crime (drug dealing r =.62, robbery r =.32, assault r =.42). Whilst this offers the most conclusive evidence so far on the relationship between actual litter, perceptions of physical and social incivilities and perceptions of crime, the study has important limitations. Notably, although the relationship between objectively assessed litter and such perceptions is assumed to be causal, the method was not designed to test for causality. Thus, similar to Perkins et al., (1990), residents are surveyed about their perceptions at a different time to the raters' assessment of litter (up to three months after). In addition, as the objective litter measure is a neighbourhood aggregate carried out by raters, there is no way of relating this to the amount of litter any individual resident respondent is actually exposed to. Exposure to litter constantly changes through time and space. As Maxfield (1987, p. 235) explains: "[U]rban residents carry out their daily routines and responsibilities within certain spatial constraints". This means that by walking on a certain side of the street, one resident may be exposed to a different amount of litter than another. To establish a causal relationship between litter and any crime-related measure it is necessary to collect data relating to both using the same respondents in the same time window.

In summary, many studies examine the potential links between physical and social incivilities (both actual and perceived) and various crime-related measures, including perceptions of crime and fear of crime. However, we suggest current understanding of such relationships is limited. First, in most of these studies, litter is examined as part of an index of incivilities, rather than being isolated as a single item. Second, whilst many of these studies establish a correlation between litter and other incivilities, a causal relationship is not

established. Accordingly, we isolate litter as a physical incivility and test for causality in our first hypothesis:

H_1: Exposure to litter will be related to higher anticipation of all incivilities (both physical and social).

A second limitation of existing research relates to the broken windows thesis (Wilson & Kelling, 1982) and its subsequent interpretations. As noted above, implicit in these is the notion that physical incivilities (like litter) can lead to social incivilities. Doran and Lees (2005) emphasise this cycle thus: "if a window in a building is broken and left unrepaired, the other windows will soon be broken". To clarify this sequence, whilst the initial broken window may be due to lack of upkeep, i.e., a physical incivility, the act of breaking more windows is vandalism, i.e., a social incivility.

The connection between physical and social incivilities is also implied in other research. Rohe and Burby (1988) found social incivilities to be more influencing of fear of crime than physical incivilities, and *assumed* the two incivility types to be linked. However, these links were not tested in their research, although other research (Pitner et al., 2012) has found them to be correlated. The criticism here is that any correlation between physical and social incivilities is not evidence of a sequence whereby exposure to the former will lead to the latter. Our second hypothesis is therefore:

H_2: People exposed to litter will have a higher anticipation of social incivilities than those not exposed to litter.

A third limitation of existing research is that in those few studies that isolate actual litter to some degree and establish its relationship with crime-related measures (e.g. Hur & Nasar, 2014; Perkins et al., 1990, 1992), any seeming causality is invalidated by the fact that data on litter and the crime-related measure in question are gathered at different times. This leads to our third hypothesis:

H_3: People exposed to litter will have perceptions of crime prevalence higher than those not exposed to litter.

2.1 Gender

Not yet discussed are differences in how men and women may recall litter, anticipate incivilities (both social and physical) and perceive crime prevalence. Experiments conducted by (Keep Britain Tidy, 2015) found that men consistently littered more than women. By contrast, there is evidence that women are more likely than men to identify litter as making an area less safe (Pitner et al., 2012). Women are also reported as having higher awareness of other environmental cues relating to spatial and urban design, such as lighting levels, the amount of tree cover and the general visibility of the space (Montgomery, 1994; Oc & Tiesdell, 1997; Wekerle & Whitzman, 1995). Various studies (Eals & Silverman, 1994; Galea & Kimura, 1993; Hill, Grut, Wahlin, Winblad, & Bäckman, 1995) also show differences between men and women in their performance of visual-related memory or 'recall' tasks. Accordingly, we also expect women to be more aware of litter and recall it as a form of environmental cue. Hence:

H_4 Women will recall seeing litter more often than men will.

Regarding the anticipation of incivilities, LaGrange et al. (1992) and Skogan and Maxfield (1981) find no significant gender effect where incivilities (social or physical) are concerned, but work by Greenberg and Schneider (1995, p. 507) demonstrates that "White, married women who were homeowners were more likely to be bothered by neighborhood people, noise, litter and housing deterioration, and non-residential land uses". Likewise, (Franklin and Franklin, 2008; p. 15) suggest that "women may attribute higher levels of disorder to their surroundings compared with men", whilst Pitner et al. (2012) find gender differences in the identification of some individual incivility items, most notably 'vacant lots' and 'debris', although when all physical and social incivility items are combined no notable

gender difference remains. As the literature on incivilities is divided as regarding gender differences, we propose the following hypothesis:

H_5 There will be no difference between men's and women's anticipation of incivilities (physical and social).

However, as the focus of this study is litter, we will also investigate any potential interaction effects between gender and litter, in relation to the anticipation of incivilities.

H_6 The impact of exposure to litter on anticipation of incivilities (physical and social) will be higher for women than for men.

If women recall more litter and/or anticipate more incivilities than men anticipate, this might help account for long-standing evidence of perceptions of higher crime prevalence amongst women in statistical sources such as the England and Wales Crime Survey. For example the 2012/13 results showed that 75% of women compared to 63% of men believed that '[c]rime has gone up 'a little' or 'a lot' in the past few years' (Office for National Statistics, 2014a), even though police-recorded crime in England and Wales has fallen consistently since 1995 (Office for National Statistics, 2014b). Other studies show women have an elevated *fear of* crime compared to men (Atkins, 1989; Mirrlees-Black & Budd, 1997; Pitner et al., 2012; Stanko, 1995), although some argue this reflects men's and women's differing abilities to physically defend themselves (Oc & Tiesdell, 1997), emphasising connections between *being* vulnerable and *feeling* vulnerable in relation to fear of crime (Jackson, 2009; Killias, 1990). Others suggest women's fear of crime is connected to their relative power over space (Pain, 1997; Valentine, 1989) or being 'taught to fear' (Franklin & Franklin, 2008). Reflecting findings in the above work, we propose the following hypothesis:

H_7 Women's perceptions of crime prevalence will be higher than those of men.

Again, however, as the focus of this study is litter we will also investigate any potential interaction effects between litter, gender and perceptions of crime prevalence, hence:

H_8 The impact of exposure to litter on perceptions of higher crime prevalence will be higher for women than for men.

2.2 Brand

Any study examining litter arguably needs to consider brand, as most litter is branded packaging (Roper & Parker, 2013). There is little investigation of the relationship between litter and brand. Exceptions are Roper and Parker (2006) and Stevens (2008), who investigate the brands seen most frequently as litter, and Roper and Parker (2013) who explore how brand evaluations are affected by litter. Branded packaging strengthens the memory associations individuals have with brands (Keller, 1993; Underwood & Klein, 2002). Given the investment manufacturers make in branded packaging we would not expect these memory associations to cease once the product within the packaging has been consumed. However, the more memorable and distinctive designs of branded packaging may also have the unintended consequence of making some litter (i.e., discarded packaging) more noticeable. Hence:

H_9: People exposed to branded litter will have greater recall of that litter than those exposed to unbranded litter.

We are also interested in whether there is a difference in the anticipation of incivilities and perceptions of crime prevalence between participants exposed to branded as opposed to unbranded litter. An association with litter is proven detrimental to a brand (Roper & Parker, 2013); but, does brand have an effect on litter? Could positive brand associations 'mitigate' any negative perceptions associated with litter? Alternatively, does all litter, irrespective of brand, affect people's perceptions of incivilities and crime prevalence in a similar manner?

There are three underlying attitudinal mechanisms whereby brand may influence perceptions of litter. The first is a 'global transfer of valence' (Kim, Allen, & Kardes, 1996), where attitude shifts from one source to another (i.e., I like the brand, *ergo* I like the litter). A second mechanism is attribute-specific valence transfer (Brendl, Pelham, & Carvallo, 2005). Therefore, in the case of a fast-food brand, positive brand attributes such as 'convenience' or 'popularity' might be transferred from the brand to the litter reducing any overall negative attitude towards that litter. The third attitudinal mechanism that could influence perceptions of litter is 'meaning transfer' (Kim et al., 1996), where the association between two objects is based upon an inference of similarity (Aaker, 1997). For example, given the prevalence of fast-food litter (Roper & Parker, 2013), we would expect the association between a fast-food brand and fast-food litter to be quite strong.

In summary, the anticipation of incivilities and perceptions of crime prevalence might vary between people exposed to branded and unbranded litter, but this has not been examined in the literature. Therefore, we propose the following hypotheses:

H_{10}: Anticipation of incivilities (physical and social) will not vary between people that have been exposed to branded litter and people that have been exposed to unbranded litter.

H_{11}: Perceptions of crime prevalence will not vary between people that have been exposed to branded litter and people that have been exposed to unbranded litter.

3. Method

The research adopted an experimental method, manipulating exposure to litter before testing peoples' anticipation of incivilities in a recreational space and their perceptions of crime prevalence. Three short films (90 seconds duration) were the experimental stimuli.

These were developed using storyboards and scripting (Swain, 1976), and shot and edited using a professional film-maker. The films took the form of a TV news broadcast from a public park within a UK town, in which a reporter (trained actor) discussed the opening of fast-food outlets in park locations.

Fast-food consumption was the subject of the news report as it related to the type of litter shown in the three films or experimental conditions, and the measurement of any resultant brand effect. Participants saw short cutaways of park scenes of the same duration, with either: i) no litter present (*no litter* condition); ii) discarded fast-food litter bearing the McDonald's brand (*branded litter* condition); or iii) plain white fast-food litter without branding (*unbranded litter* condition). The use of fast-food packaging reflects its position as the fastest growing category of litter in the UK (Roper & Parker, 2013). There was no mention of litter in the film by the reporter.

To maximise experimental validity, in the cutaways involving the two litter conditions (*branded* and *unbranded*) the litter was placed at exactly the same point on the ground, and was of exactly the same type (e.g. a cup, burger box or fries container) and volume. This replicates experimental work by Toet and van Schaik, (2012) in which litter (along with other physical incivilities) was fixed at corresponding points on the ground in real and virtual urban space.

The experiment was conducted online using Qualtrics survey software. Participants were panel members and therefore familiar with completing research surveys. They were able to withdraw from the experiment at any time. Having seen one of the three films (random allocation), participants answered questions measuring their anticipation of incivilities occurring within the park and their perceptions of crime prevalence. A park was chosen as the locational focus for the study as it was hoped it would be understood as a recreational space amongst participants (Low et al., 2005), and not a space biased by feelings of participant

residency or overt ‘urban-ness’, as with many of the studies discussed above. Also, despite an ability to promote feelings of social safety (Maas, Verheij, Spreeuwenberg, & Groenewegen, 2008), incivilities may still occur in parks (Mitchell, 1995; Zukin, 2010), and parks can also invoke fear or crime amongst their visitors (Jorgensen, Ellis, & Ruddell, 2013).

3.1 Measures

To measure anticipation of incivilities participants were asked, ‘How likely are the following to happen in the area you have just seen in the film?’ The first part of this question draws directly from the work of LaGrange et al., (1992). Thirteen social and physical incivilities were broadly identified from the literature[3] and participants recorded the likelihood of these happening on a seven point Likert scale from -3 to +3 (very unlikely to very likely). Scale reliability measured by Cronbach's alpha was .933. The 13 anticipated incivilities measured were: people hanging around (Keown, 2008; LaGrange et al., 1992; Office for National Statistics, 2013; Perkins et al., 1992; Piquero, 1999; Toet & van Schaik, 2012); people drunk or rowdy (Ellaway, Macintyre, & Bonnefoy, 2005; LaGrange et al., 1992; Office for National Statistics, 2013; Perkins et al., 1992; Piquero, 1999); vandalism and graffiti (Brown et al., 2004; Ellaway et al., 2005; Hur & Nasar, 2014; LaGrange et al., 1992; Office for National Statistics, 2013; Perkins et al., 1992; Piquero, 1999; Pitner et al., 2012; Toet & van Schaik, 2012); people using or dealing drugs (Keown, 2008; Office for National Statistics, 2013; Pitner et al., 2012); cat and dog mess (Ellaway et al., 2005; Toet & van Schaik, 2012); abandoned cars (Ellaway et al., 2005; LaGrange et al., 1992; Office for National Statistics, 2013; Piquero, 1999); loose dogs (Brown et al., 2004; Greenberg & Schneider, 1995; LaGrange et al., 1992); harassment (Piquero, 1999); litter and rubbish (Brown et al., 2004; Ellaway et al., 2005; Greenberg & Schneider, 1995; Hur & Nasar, 2014; LaGrange et al., 1992; McGarrell et al., 1997; Office for National Statistics, 2013; Perkins et

[3] As noted above, different authors sometimes refer to incivilities by other terms such as ‘disorder’. In addition, they use various synonyms for the same incivilities. E.g., litter is referred to as ‘trash and litter’ (La Grange et al., 1992); ‘garbage’ (McGarrell et al., 2007) and ‘debris’ (Pitner et al., 2012).

al., 1992; Piquero, 1999; Pitner et al., 2012; Toet & van Schaik, 2012); too much noise (LaGrange et al., 1992; Office for National Statistics, 2013); people sleeping rough (Keown, 2008; Pitner et al., 2012); discarded needles (Ellaway et al., 2005) and broken glass (Ellaway et al., 2005). For the purposes of analysis, a total score of all 13 incivility items was used to measure anticipated incivilities (physical and social) for H_1, H_5, H_6 and H_{10}. A total score of six of these 13 incivility items (people hanging around; people drunk or rowdy; people using or dealing drugs; harassment; too much noise; people sleeping rough) was used to measure anticipated social incivilities for H_2.

Much of the literature reviewed above concentrates on 'fear of crime', but there is controversy about its measurement. Thus, criminological research has identified fear of crime as a multi-dimensional phenomenon affected by human perceptions and underlying psychological processes, with the method of measurement determining how results about fear of crime are perceived (Farrall, 2004; Farrall & Gadd, 2004; Gray, Jackson, & Farrall, 2008; Hough, 2004; Jackson, 2011; Lee, 2007). Indeed, Skogan and Maxfield (1981) note that there is no universal measurement or semantic standard (e.g. 'worried about', 'safe from') for fear of crime. Due to these challenges of measurement, we chose to measure 'perceptions of crime prevalence' rather than 'fear of crime', using a question from the 2013-14 Crime Survey for England and Wales (Office for National Statistics, 2013): namely, "What do you think has happened to crime in the country as a whole over the past few years?". This was measured on a 5-point scale from 'gone up a lot' to 'gone down a lot' (see H_3, H_7, H_8 and H_{11}).

To establish if participants remembered seeing litter in the films shown, recall (Herlitz, Nilson, & Backman, 1997) was measured. Participants were asked the recall question: 'Which of the following do you remember seeing in the film?' A list of 16 items was provided to choose from, including McDonald's packaging, McDonald's litter, takeaway packaging and takeaway litter. Both 'packaging' and 'litter' were included to reflect

individual differences in how discarded fast-food containers may be perceived. A combined score of these two litter-related questionnaire items was used to measure litter recall, relating to H_4 and H_9.

3.2 Sample

In total 680 participants completed the experiment, of which 18 were discounted as they thought the film was artificial. This left 662 usable responses. The number of participants in the three experimental conditions was as follows: no litter (n=219), branded litter (n=201), and unbranded litter (n=242). Because we used the random allocation function in Qualtrics (rather than enforcing a quota) the sample was imbalanced across the survey conditions. The sample was fairly evenly spread across the age categories (18-24, n=117; 25-34, n=191; 35-44 n=134; 45+ n=220), with more females (64%) than males (36%). The distribution of the dependent variables (anticipation of incivilities; perceptions of crime prevalence and litter recall) were then checked and all demonstrated characteristics of a normal distribution. Thus, the skewness of the distribution of the means of the dependent variables ranged from .02 to .31, firmly within the boundaries of the +.5 to -.5 deemed acceptable by Bulmer (1979) .

4. Results

Independent-sample t-tests were conducted to compare anticipation of all incivilities (i.e., physical and social), anticipation of social incivilities, and perceptions of crime prevalence, in litter (branded and unbranded combined) and no litter conditions (H_1, H_2 and H_3). The results are presented in Table 1.

There was a significant difference in the mean values reported for the litter and no litter conditions: Seeing litter had a statistically significant impact upon participants' anticipation of all incivilities (physical and social) occurring, as well as social incivilities in particular. Litter also had a statistically significant detrimental effect on perceptions of crime

prevalence, meaning participants in litter conditions were more likely to perceive crime was getting worse.

The next test relates to gender and how often and how accurately participants recalled seeing litter. Independent-sample t-tests were conducted to compare recall rates (H_4) between males and females. The results are also presented in Table 1. There is a difference in the litter recall rates between men and women.

Hypothesis	M	SD	T	*P*
H_1: Anticipation of incivilities both physical and social (very unlikely/very likely) – litter/no litter	51.87/40.30	13.59/14.21	10.14	.001
H_2: Anticipation of social incivilities (very unlikely/very likely) – litter/no litter	22.74/18.11	6.81/6.65	8.30	.001
H_3: Perceptions of crime prevalence (gone up a lot/gone down a lot) – litter/no litter	2.31/2.53	.97/.97	2.84	.005[4]
H_4 Litter recall (men/women)	.85/1.00	.79/.79	-2.48	.014

Table 1: Results of H_1-H_4

Continuing with gender, independent-sample t-tests compare anticipation of incivilities (physical and social) (H_5) and perceptions of crime prevalence (H_7) between males and females (see Table 2).

Hypothesis	M	SD	T	*P*
H_5: Anticipation of incivilities both physical and social (very unlikely/very likely) /men/women	48.22/47.90	14.27/14.90	2.40	.810
H_7: Perceptions of crime prevalence (gone up a lot/gone down a lot) /men/women	2.56/2.28	13.59/14.21	10.14	.001

Table 2: Results of H_5 and H_6

As expected, women have significantly higher ($p<.001$) perceptions of crime prevalence than men, but there is no difference in the anticipation of incivilities between men and women.

Next, we test for potential interaction effects, between litter and gender on the anticipation of incivilities (H_6) and perceptions of crime prevalence (H_8). The plot of the mean values of anticipation of incivilities for men and women shows no difference in direction or slope, suggesting there is no interaction effect between litter and gender on the anticipation of incivilities (see Figure 1). This is further tested by means of a two-way analysis of variance (see Table 3).

Hypothesis	**F**	**p**
H_6 : The impact of exposure to litter on anticipation of incivilities will be higher for women than for men.	.40	.598
H8: The impact of exposure to litter on perceptions of higher crime prevalence will be higher for women than for men.	.78	.377

Table 3: Results of H_6 and H_8

No interaction effect between litter and gender was detected on the anticipation of incivilities (F=.40; p=.598)

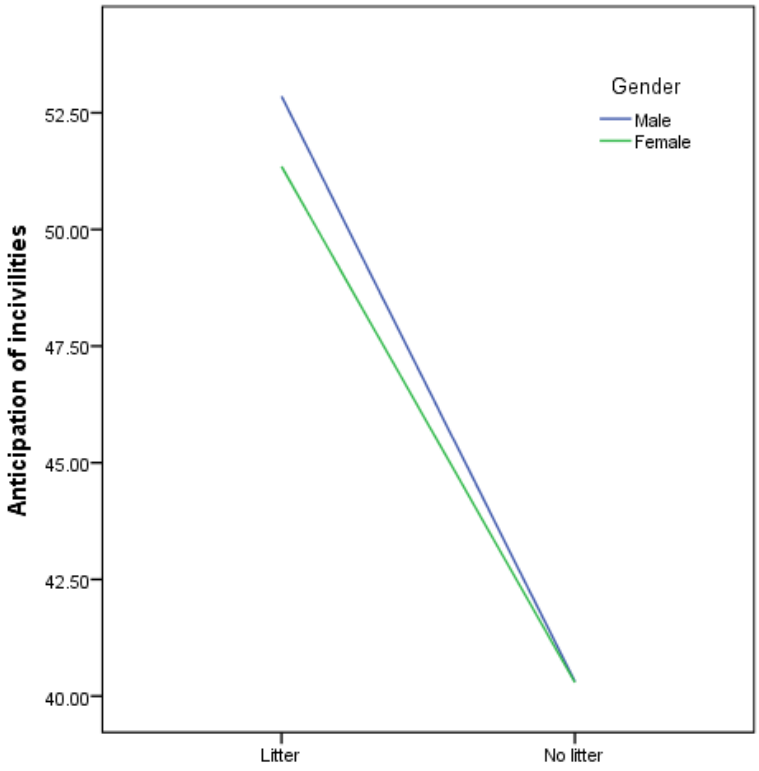

Figure 1: Mean plots of anticipation of incivilities by condition and gender

Turning to perceptions of crime prevalence and potential interaction effects, Figure 2 shows a difference between the mean values for men and women in both the litter and no litter conditions, confirming H_7 (i.e., women have perceptions of higher crime prevalence than men have). However, the direction and slope of both the male and female lines is similar, suggesting that there is still no interaction effect, between litter and gender on their impact on perceptions of crime prevalence. This was tested by means of a two-way analysis of variance (see Table 3). There was no significant interaction effect between gender and litter and perceptions of crime (F=.78; p=.377)

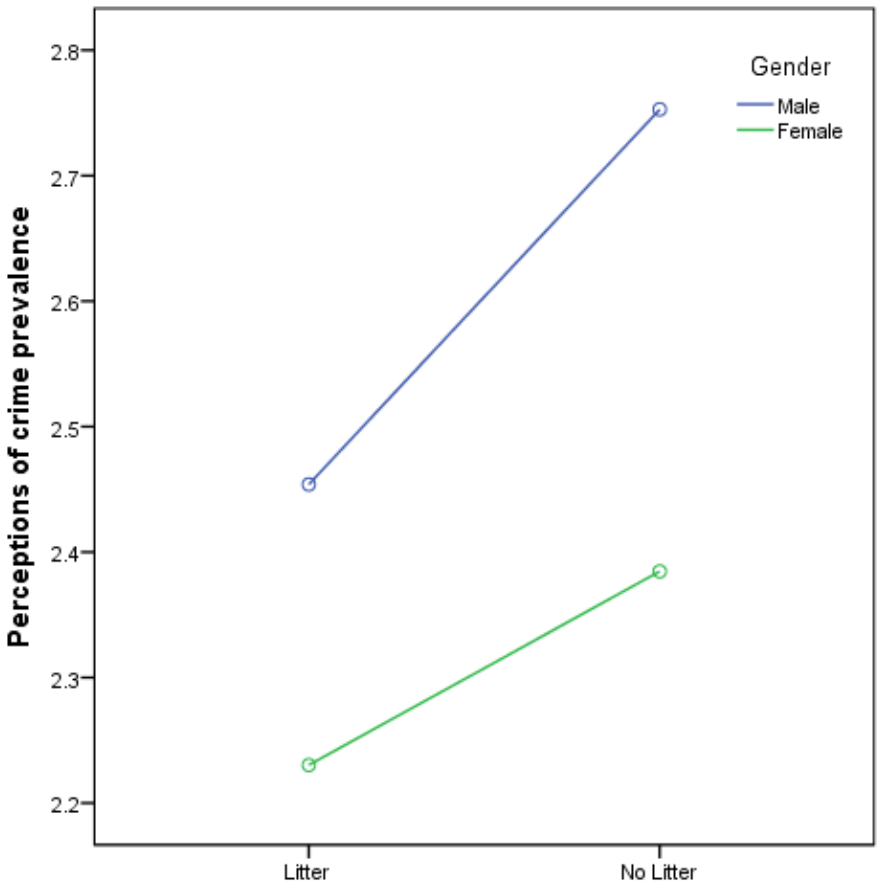

Figure 2: Mean plots of perceptions of crime prevalence by condition and gender

Next, we use an independent-sample t-test to compare litter recall (H_9) between branded (McDonald's) litter and unbranded litter conditions (see Table 5).

Hypothesis	M	SD	T	p
H_9: Recall litter (branded litter/unbranded litter)	1.59/1.06	.657/.550	9.16	.000

Table 5: Results of H_7

The participants exposed to branded litter were more likely to recall seeing litter – than those that had seen unbranded litter.

In Table 6 we test for a possible brand effect on the anticipation of incivilities (H_{10}) and perceptions of crime prevalence (H_{11}) by comparing means (using an independent samples t-test) of those participants exposed to branded litter and unbranded litter.

Hypothesis	M	SD	T	p

H_{10}: Anticipation of incivilities both physical and social - branded litter/unbranded litter	54.66/53.97	15.58/15.94	4.55	.649
H_{11}: Perceptions of crime prevalence – branded litter /unbranded litter	2.33/2.29	.95/.99	4.22	.673

Table 6: Results of H_{10} and H_{11}

There is no significant difference in the mean scores for anticipation of incivilities and perceptions of crime between participants in the branded and unbranded litter conditions. Thus, litter impacts on perceptions of incivilities and crime prevalence in a general way, regardless of whether it is branded or not.

5. Discussion and conclusions

The first contribution of our study is in providing evidence for a causal relationship between seeing litter and the anticipation of both physical and social incivilities and perceptions of crime prevalence, at the level of the individual. LaGrange et al., (1992, p. 329) suggest:

> "…community leaders and police officials are best advised to place higher priority on removing social incivilities from disorderly neighbourhoods than physical incivilities."

This point is correct, if only in terms of the fact that it is not really the police's job to remove physical incivilities; in fact, it tends to be the job of municipal agencies and councils. In the UK, for example, the Environmental Protection Act of 1990 makes litter clearing the legal responsibility of local authorities. However, because litter is relatively easy to remove from the environment, for the police or any other authority to view it as a low priority, as LaGrange et al. (1992) imply, could be missing a potential 'quick win' in tackling perceptions of crime prevalence, especially as we demonstrate that litter and such perceptions are causally connected. Whilst we are not suggesting the police start picking up litter, in many countries, such as England and Wales, they do have powers to prosecute and fine any offending citizens dropping litter (under the Clean Neighbourhoods and Environment Act, 2005). In addition to

removal and fining, research suggests that litter abatement can be brought about by the use of explicit and implicit messaging on litterbins (de Kort, Mccalley, & Midden, 2008).

A key point here is that litter removal is a relatively low financial investment (with the exception of chewing gum removal, which is expensive) for organisations tasked with improving places and reducing their associated or perceived criminal activity. It seems odd, therefore, that certain cash-strapped municipal agencies do not always appear to treat litter as a priority (Cain, 2014; Manchester Evening News, 2012). Indeed, paradoxically, Pain, MacFarlane, Turner and Gill (2006) have pointed out that the efforts and policy initiatives of those authorities entrusted with managing places invariably focus on expensive infrastructural improvements, such as streetscape redesign, street lighting and CCTV. This is in a belief that criminal opportunity, and fear of crime, may be mitigated through these measures, reflecting debates in the Crime Prevention Through Environmental Design (CPTED) literature (Cozens, Saville, & Hillier, 2005; Gardner, 1981; Marzbali, Abdullah, Razak, & Maghsoodi Tilaki, 2012; Minnery & Lim, 2005; Newman, 1972; Taylor & Harrell, 1996). As well as often being expensive, a potential problem with these 'improvements' to the built environment is that they could have unintentional negative effects on citizens' perceptions of crime, and potentially their fear of criminal activity. Thus, better street lighting might actually make people perceive crime more if it gives incivilities greater visibility (Herbert & Davidson, 1995), or makes people feel more vulnerable to potential assailants (Nasar & Jones, 1997; Pain & Townshend, 2002; Pain et al., 2006; Painter, 2002). Applying this logic to streetscapes, it is easy to understand how the redesign of buildings and pedestrian space to try and manage perceptions of crime, fear of crime and indeed crime itself, can also affect wind patterns, channelling and vortices (Brown, Khalsa, Nelson, & Boswell, 2004). In turn, such environmental changes can affect the movement of litter (Seco Pon & Becherucci, 2012), causing it to collect in 'leeward' spaces. One might speculate that such pooling of litter could

make it more visible and feed through to negatively affect perceptions of crime prevalence, which, in turn, may cancel out any improvements in feelings of personal safety brought about by the streetscape redesign itself.

As demonstrated above, litter has been examined at an aggregate level in most research into its relationship with various crime-related measures, typically as part of an index of incivilities. Yet, there is good reason for the litter effect to be examined separately; especially if it is an incivility that can be ameliorated easily and cheaply. Indeed, potential diurnal spikes in litter-dropping behaviour (e.g. bar and club closing times) suggest that the resourcing of litter clearance may not have to be up-scaled that much to create environments that are litter-free for the majority of time. It merely requires an intelligent scheduling of litter clearance so it occurs during or immediately after surges in litter dropping. Hence, Lambeth Council (2012) in London, UK have stated that extra street sweeping patrols "will run four nights a week from Thursday to Sunday 8pm to 6am, covering the peak times when people visit Lambeth's restaurants, bars and clubs". It is also difficult to see any counteracting negative impact picking up litter might have, as is the case with certain aspects of infrastructural redesign within the urban environment (see above). Strategies for reducing litter have been previously examined in the academic literature (Huffman, Grossnickle, Cope, & Huffman, 1995), so perhaps it is time to think again about how research in this area could help bring about a reduction of the litter in cities and on streets.

A second contribution of our work relates to the disentanglement of actual and perceived incivilities. Some previous research has suggested that perceived incivilities are greater than their reality on the ground, and that perceived incivilities are more predictive of crime perceptions than actual incivilities (Perkins et al., 1990). In short, this suggests that those who perceive more incivilities, even if they do not actually witness them, are more likely to perceive crime and, potentially, to fear it; although as indicated above, the

presentation of such straightforward relationships may mask a complex interplay of human perceptions and underlying psychological processes (e.g., Jackson, 2011). Nevertheless, by manipulating exposure to litter, we provide evidence that actual litter, not perceptions of litter, causes people to perceive crime is getting worse. This suggests that actual incivilities (i.e., the fact there is litter on the ground in a given place) may be more important in explaining crime perceptions than is sometimes given credit for.

A third contribution of our study is its input into academic debates on the role of gender in perceptions of crime. Although we found women's perceptions of crime prevalence to be significantly higher than those of men, they were no more likely than men were to anticipate incivilities. This is interesting, because although our female participants did conform to the 'worried woman' stereotype (Gilchrist et al., 1998) when we asked them to consider perceptions of crime prevalence in retrospect and at the spatial level of the country as a whole, when we questioned them about incivilities in prospect (i.e., their anticipation of them) within a smaller spatial area (i.e., the park), their responses were no different to the men in the sample. This suggests that the mere use of the word 'crime' may invoke a gendered response or a 'gendered fear of crime socialization' (Rader & Haynes, 2011). Such findings also indicate that there is a future research agenda in examining how perceptions of crime might be affected by the scale of spatial focus, as well as retrospective vs. prospective viewpoints. This latter issue touches on the concept of the 'impact bias' in forecasted and remembered affective states, situated within the social psychology literature (see, for example, Wilson, Meyers, & Gilbert, 2003).

A fourth contribution of our study is that it suggests that brand owners and retailers might want to do more to clear up litter around their premises as it may affect their customers' perceptions of crime in the immediate area of the business. On the one hand, organisations may feel that because there is no branded litter carry-over effect on anticipation

of incivilities and perceptions of crime prevalence, then there is little benefit in involving themselves in the eradication of discarded packaging carrying their organisational logo. However, our demonstration of the general (i.e., branded and unbranded) litter effect on the anticipation of incivilities occurring in a given place, as well as on perceptions of crime prevalence (assuming our experimental findings transfer to a real-world setting), indicates that all organisations wanting to attract consumers/residents/tourists into their physical proximity need to think about the space outside their business as a component of the 'place' element of the marketing mix. Not to do so may translate into a loss of footfall and custom.

Turning to the limitations of our research, the use of film as an experimental medium deserves mention. Whilst film allowed high levels of control across the three litter conditions, it only exposed participants indirectly to a spatial environment. This is pragmatic, but not ideal. Future research might undertake similar experimental manipulation of incivility items, such as litter, within a controlled, yet real, spatial environment (e.g. a cordoned-off area of a park). A downside of this suggested approach relates to its logistical possibility, and the fact it might be perceived as artificial by those taking part, which could affect results. By contrast, only a few of our participants felt that the film used was artificial. However, any study examining the impact of incivilities via film or computer simulation should be mindful of research suggesting such environments may intensify participants' focus on the details of incivilities (such as litter) compared to real world situations (Toet & van Schaik, 2012). This highlights the fact that experimental methods are challenging to invoke when exploring people's perceptions and reactions to conditions in outdoor environments; but continued efforts at creative experimental design may help circumvent this.

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