**Influencing Social Change by Engaging the Community in a Holistic Evaluation Methodolog*y***

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In a society that aims to reduce waste many forms of litter represent a loss of resources. Consequently litter beyond its visual and environmental impacts and association with anti-social behaviour is receiving increased attention.

Historically measurement of litter has focussed on end-of-pipe counts or inspection of items on the ground with an inadequate ability to explain how the litter got there and limited capacity to guide effective prevention initiatives. Consequently some interventions became overly focussed on clean up activities rather than strategically targeting upstream actions.

Some researchers have constructed approaches to suggest underlying intentions of litterers while others rely on self–reports that are open to social desirability influences. Some use a more reliable approach to understanding disposal behaviour observing actual bin use and littering which has revealed the complexity of factors underlying disposal actions.

The Community Change practitioner framework for examining and explaining key influences on environmentally desirable behaviour is used to describe factors behind littering. Insights into factors influencing disposal actions are measured with the Clean Communities Assessment Tool (CCAT), which has enabled local and state agencies to establish and monitor litter prevention practices in public places.

Building strong measurement foundations has been the key for assisting agencies to develop long-term strategies for reaching toward zero waste targets and sustainable visions for clean, safe and liveable communities.

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In a society that aims to reduce waste many forms of litter represent a loss of resources (Curnow & Spehr, 2011, Environment Protection and Heritage Council, 2010). Consequently litter beyond its visual and environmental impacts and association with anti-social behaviour is receiving increased attention (De Kort, McCalley & Cees, 2008; Wever, 2006).

Littering behaviour is complex, influenced by interactions between personal perceptions, attitudes, values and behaviours, as well as environmental factors such as prompts, the presence of bins, the amount of litter already present at the site, and the presence and actions of other people. In order to achieve a comprehensive understanding of littering behaviour these elements need to be studied holistically to guide the most cost-effective use of resources for changing littering behaviour (Curnow, 2004; Curnow, Streker & Williams, 1997, Perry, Juhlin & Normark, 2010).

In Australia during 1997-2004, a comprehensive study of disposal behaviour, the Litter Behaviour Studies (LBS) (Curnow & Spehr, 2005b) tracked trends annually and measured the impact of various litter prevention and public place recycling programs, including local community initiatives and large events like the 2000 Sydney Olympic Games. Outcomes from the LBS behavioural observation projects have helped to identify the effectiveness of a range of anti-littering and pro-environmental initiatives in changing people's behaviour (Pepper, & McCaskill, 2003). Overseas researchers have also systematically gathered observations of littering and bin use in natural settings across the U.S for Keep America Beautiful (Schultz et al, 2009), in specific locations at a university (Lui & Sibley 2004) and in a shopping centre (De Kort et al., 2008).

Reduced reliance on self-report measures (subject to socially desirability effects) in favour of measurement of observable behaviour has provided an improved basis for relevant, well founded and sustainable recommendations for influencing environmentally desirable disposal behaviours. This shift to a more behavioural focus on measurement has also resulted in increased investigation into those factors likely to facilitate positive behavioural change, making prevention activities more complex for practitioners than simply providing more bins and cleaner spaces (Noe, 2006).

Previously, many litter prevention efforts stemmed from a simplistic assumption that educating people would lead to a positive change in environmentally responsible behaviour. While education can be valuable, multiple factors influencing behaviour can in fact be operating, creating multiple points at which change programs can effectively intervene (Cunningham, Spehr & Curnow, 2005; De Kort et al., 2008; Davies, Foxall & Pallister, 2002; Spehr & Curnow, 2005; Taylor, Fletcher, Lewis & Curnow, 2007). These multiple factors can be complex and overlapping, creating individual actions each occurring in their own context, place and time.

Some of this complexity is illustrated using the ‘Influences on Environmentally Desirable Behaviour’ diagram shown below. The diagram represents eight major influences on behaviour as supported by social science research with presentation of selected outcomes particularly relevant to preventing litter and encouraging bin use and recycling. It may be helpful to think of these separate influences as ‘gases’ that combine to fill a space, resulting in a unique ‘mixture’ or behaviour that is not fixed or static. A greater amount of one type of gas (or influence) may move into the space, while other influences can be in smaller amounts or non-existent.

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**Influences on Environmentally Desirable Behaviour (Littering)**

For example, evidence from the LBS (Curnow & Spehr, 2005b) and elsewhere shows that the ‘mix of gases’ underlying disposal behaviour is anything but constant:

* People do not simply fall into stereotypical categories of being either ‘litterers’ or ‘non-litterers’.
* Littering and bin use behaviours are fluid (not fixed) - a person may litter in some situations but not in others, or may litter particular items but not others (Smith, Thomas & Novotny, 2011), or walk longer distances to find a bin in particular types of locations (Curnow & Spehr, 2005b).
* People who report littering consistently in every type of public place seem to be relatively rare.
* An individual’s disposal behaviour is a product of the context in which the behaviour occurs or site specific factors that influence a person, for example, ‘following the herd’); the individual’s motivation to control their disposal behaviour; the infrastructure made available for the containment of litter and recovery of resources; and, the level of community awareness about disposal choices and the approach taken by packaging manufacturers to encourage environmentally desirable behaviour and responsible disposal of used materials (Curnow & Spehr, 2005b). Schultz et al (2011) recently described general littering acts resulting from contextual variables and personal qualities and, given the same infrastructure and opportunities to properly dispose, individual actions varied greatly.

For simplicity, although these eight influences are presented as separate, the distinctions are somewhat arbitrary with influences often overlapping and interrelated, both conceptually and in practice. The diagram aims to provide a guide for practitioners when researching and targeting interventions rather than adopting a *one size fits* all approach to litter prevention. Although it is not possible to know exactly which influences are operating all the time, identifying the ones most likely to operate on an identified target group in the particular set of circumstances in which the behaviour occurs can help drive prevention activities that work.

The influences shown in the Environmentally Desirable Disposal Behaviour diagram can be summarised as:

**Physical environment:** *Physical features of the place (environmental facilitators) affect people’s behaviour whether or not they are aware of it*. Indeed, many pro-environmental behaviours can only take place if the necessary infrastructure is provided (Bartor, Bryan & Schultz, 2011; Chen & Tung, 2010).

However, more litter bins does not necessarily result in less litter, with around half littering acts occurring within 8 metres of a bin (Curnow and Spehr, 2005b; Golding-Williams & Barons, 2010; Wever, 2006). Opportunities exist to exploit the dynamic relationships between the physical environment and cues to moderate public disposal behaviour by improved bin placement, visibility of disposal actions assisting natural surveillance and redesign of packaging materials, (De Kort et al, 2008; Liu & Sibley, 2004; Perry, Juhlin & Normark, 2010).

**Social rules and norms:** *The rules that people use to know what values, beliefs, attitudes and behaviours may be socially appropriate or inappropriate.* These can include descriptive norms (perceptions about how widespread a behaviour is), injunctive norms (what is seen as socially acceptable or unacceptable) or personal norms (standards of behaviour people set for themselves).

Indeed the pro-social nature of binning rather than littering was described by Perry, Juhlin & Normark (2010) who observed people running after litter that had blown away and, once captured, it was not enough that the litter was binned but it needed to be seen to be binned appropriately.

However it may be misguided to expect that because norms are constantly in place with a person or subculture that they operate independent from situational factors (Kallgren, Reno & Caldini, 2000). For example, a third of the public think its okay to litter if no bins are present (Golding-Williams & Barons, 2010) and if shopping trolleys are left in disarray in public places or graffiti is present in a location, littering rates increase (Torgler, Frey & Wilson, 2009).

Attachment to a place or a sense of belonging are also likely to be mediating factors for norms which are more likely to be activated when people attach certain positive meanings to a place, e.g., being unlikely to litter in your own neighbourhood park and perhaps more likely to pick up other’s litter there.

**Legal rules:** *Rules that the community recognises as regulating its member’s actions and which may be enforced by the use of penalties.*

Local littering laws exist in most jurisdictions but may not be effectively enforced. Modern approaches to litter prevention include integration of enforcement practices (Victorian Litter Action Alliance, 2010) although there is wide variation in the application of enforcement by local authorities (Golding-Williams & Barons, 2010; Wever, 2006). Laws can help create powerful positive social expectations about behaviour but people vary with regard to the amount of legislative interference they will tolerate.

**Perceived risks:** *Judgements about the likely risks associated with a behaviour.* These include social risks (will other people think badly of me?); temporal risks (will it take too much time?); physical (will I come to some physical harm?); functional (will it really work?) or financial (will it cost too much?).

These risks have been illustrated in the LBS studies where people are less likely to open a bin if its dirty (perceived physical risk) or located too far away from where its needed (perceived temporal risk). Attempts to exploit a sense of social risk for litterers who might be publicly shamed for littering though have not always produced certain effects when litterers are adding up the likely costs of retrieving lost litter (Grasmick, Bursik & Kinsey, 1991; Perry, Juhlin & Normark, 2010).

**Behavioural momentum/habit:** *Behaviour that is highly reinforced, repeated lots of times and therefore resistant to change.* If a new behaviour is to be established, it has to be practised. We might be perfectly willing to change our behaviour but still not do so, because we do not persist enough in practicing the new behaviour until it has become a habit (Kollmuss & Agyeman, 2002). For example, Davies, Foxall & Pallister (2002) maintained that requisite knowledge and skills are not enough to recycle, a low involvement decision that may be blocked by inertia and habits.

**World view:** *Groups in the community share certain ways of looking at the world. Shared values and feelings predispose them to pay attention to some things and ignore others and they may therefore behave differently.* For example, people with largely egalitarian views may perceive that everyone has a right to enter a clean place whereas a more individualistically oriented person may see their own needs as being of overriding importance.

**Mental processes:** *The processes by which we perceive, recognise, judge, reason or imagine things.* These can include:

* Assigning undue importance to events that are easy to imagine or recall, e.g., domestic dumping may be seen as most important due to its visual size and emotional impact.
* Perceived control of our capacity to make a change to benefit the environment, e.g., the perception that one person’s litter isn’t going to make a difference to the problem as a whole.
* Willingness to restore or prevent damage depending on who the cause of the damage is attributed to, e.g., not being prepared to pick up litter that others have dropped.
* Discounting future environmental damage because current negative actions are seen as having more value, e.g., waiting until there is immediate visible evidence that local waterways are suffering before taking care with used items.
* Beliefs about environmental issues that are wrong, e.g., that cigarette butts will quickly break down in the environment.
* Ignorance of a problem or its consequences, e.g., not understanding that litter on the ground ends up in stormwater and impacts wildlife.

**Conflicting desires:** *Everyone has multiple goals, desires or preferences, some of which may outweigh others in importance or urgency.* Where conflicting goals occur some people will let short term hedonistic pursuits like being lazy and dropping litter outweigh the drivers to do the right thing and find a bin (Golding-Williams & Barons, 2010).

These eight influences on disposal behaviour may operate consciously or unconsciously – people may or may not be aware of their impact on disposal behaviour (Ruijten, 2011). For example, people are less likely to litter in a public place that look clean, safe and well cared for, even when they are not consciously aware of it. People may however, make a conscious choice to litter because there is no bin located conveniently nearby or they may leave items next to full and overflowing bins and not consider that behaviour as littering.

Insights from the diagram can contribute to the process of refining innovative litter prevention strategies such as guidelines for designing packaging to prevent littering proposed by Wever, Gutter & Silvest (2006) that target a number of the factors described above. Similarly those involved with stormwater management and litter prevention have recognised the complexity of influences on littering, recommending a range of approaches that address some of the key influences on disposal behaviour (Curnow & Chrispijn, 2005; Taylor et al, 2005).

Indeed there is great potential to provide powerful targeted and effective programs influencing disposal behaviour by bringing together social and environmental psychological perspectives with architectural place, BINfrastructure (trash can) and product design (DeKort et al, 2008). Currently Brisbane City Council is testing the effectiveness of such a combination of approaches on litter prevention and public place recycling.

To assist practitioners to assess the performance of many of the key features of public places in relation to factors influencing environmentally desirable disposal behaviour, the Clean Communities Assessment Tool (CCAT) was developed (Curnow & Spehr, 2007b).

Using direct observation of people’s behaviour, a detailed rating system and community consultation surveys (including local stories and anecdotes), the CCAT focuses on both positive and negative behaviours and moves from a ‘blaming’ model to cooperative engagement among stakeholders on how to make improvements and reduce littering.

Each CCAT assessment is conducted by two trained assessors and includes:

1. Actions: Observations of people’s *actual* disposal behaviour in a location, providing a means for checking assumptions based on self report of behaviour, i.e., checking what people *say* they *do* with what they *actually* do. Ongoing monitoring of actions in a location also enables identification of the types of items consumed by people and associated disposal behaviour.
2. **Litter Counts:** A count of every piece of litter within a 48 square metre zone that includes a bin and, ideally, some furniture or other infrastructure. Litter is categorised into seven litter item types - paper, organic, confectionery, beverage, plastic film, cigarette, and ‘other’.
3. **Behavioural influences:** Factors likely to influence disposal actions in a location.
4. Context - the level of comfort and community safety in a location, prevalence of vandalism, graffiti, commercial an domestic dumping and the location’s overall ‘cleanness’.
5. Facilities – Infrastructure (condition, cleanliness and maintenance of furniture, open space, landscaping, entrance and boundary markers) and **BINfrastructure** (number of litter/recycling/butt bins and presentation, position, performance and cleanliness features).
6. **Community** attitudes and perceptions - knowledge, opinions and attitudes towards the place itself and the adequacy of disposal facilities (including local stories and anecdotes).

Detailed quality control processes including inter-rater reliability procedures limit the influence of extraneous factors and promote the robustness of the tool. CCAT assessments facilitate cooperative engagement among stakeholders on how to make improvements and reduce littering based on insights into how actions are understood by local communities. A recent trend identified by the CCAT has been lower community satisfaction with litter management despite empirical evidence of local reductions in littering (Curnow & Spehr, 2007a & 2010a; Golding-Williams, 2010).

In Australia and New Zealand, a number of local government and litter prevention agencies have adopted this comprehensive approach to assessing environmental facilitators to generate support for building and sustaining clean and safe communities (Curnow & Spehr, 2007b; Pickles & Chrisant, 2004). Use of the CCAT has demonstrated ‘what works’ so agencies can build on successes, like those achieved at the 2006 Melbourne Commonwealth Games which showed reduced littering and increased public place recycling (Curnow & Spehr, 2010b). CCAT outcomes have also been used to address litter hot spots (Curnow & Spehr, 2010a) and the impact of bans on public place smoking at licensed premises (Curnow & Spehr, 2008).

As use of the tool has evolved, capacity building of local stakeholders in the CCAT’s use has enabled better understanding of local community members’ priorities with improvements more rapidly and efficiently implemented to create cleaner safe and sustainable public spaces (Curnow & Spehr, 2010a; Golding-Williams, Barons & Martin 2010).

Improvements in physical, social and perceived risk characteristics as described in the model above work together to promote the social compact between people who use the place and those who manage it, creating a situation where everyone has an increased stake in behaving appropriately to keep it clean and improve resource recovery.

At the local council level, the development of a litter prevention strategy using a whole-of-council approach can be an effective way to improve management of local sites (Curnow & Spehr, 2006). Current approaches that view litter prevention within a broader context of creating well cared for, safe and user friendly public places are most likely to be sustainable, with public places remaining clean and accruing numerous other social and economic benefits in addition to environmental ones.

Through implementing change strategies as a result of ongoing regular CCAT assessment, patterns of disposal behaviour in a public place can undergo verifiably significant positive change. Once sustained, these improvements translate into a longer term social change where positive behaviours become the norm and negative behaviours are deviant. The CCAT provides an accessible assessment method that can help drive change by evaluating public place performance in relation to broader disposal behaviour influences, as well as measuring behavioural outcomes.

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