



A report on the use of Microbins at Clapham Junction station

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Executive summary

- Approximately 6 out of every 10 smokers (from a total of 217 observations) used a bin to dispose of their cigarette butts.
- At the site, there were 7 microbins and 2 standard bins.
- When cigarette butts were discarded in bins, more than 4 in 10 smokers used a microbin.
- Solo smokers are less likely to use a bin than group smokers.
- Solo smokers who use a bin are about as likely to choose a microbin as a standard bin.
- More smokers smoked whilst standing still, when alone and before they entered the station.
- The length of time spent smoking did not predict disposal choice.

Introduction

This study was an investigation into the effectiveness of the microbins; a low-cost, cigarette and gum specific disposal intervention. The aim of the study was to identify which key modifiers best predicted discard rates and to compare how frequently the microbins were used versus other disposal methods in the vicinity.

Methods

The study took place at the Grant Road entrance of Clapham Junction train station between 3 May and 11 July 2018. Data collection sessions took place over five dry weather weekdays between the hours of 08:30 and 17:30, with sessions lasting between approximately 1 and 2 hours. Participants were covertly observed as they entered or exited the station by a researcher (CG) who was positioned inconspicuously and within close proximity of the station. The researcher discreetly noted cigarette disposal rates (microbin, other bin, discarded, taken away) and key modifiers (sex, age, origin, group, movement, vigilance and smoking duration) on their mobile phone.

Details

A total of 217 (135 male) individual smokers were observed in eight observation sessions (mean=27.13 smokers per session). 12.4% were classified as Young, 62.7% as Middle Aged, and 23.5% as Old Aged. The remainder were unclassified. The point of Origin, whether or not smokers were in a Group, standing still or moving (Movement), and the level of Vigilance were all recorded.

Finally, the Duration of smoking events (minutes; Figure 1) and how each smoker Disposed of their finished cigarette were recorded (Table 1). Duration was not normally distributed and there were 35 missing data points.

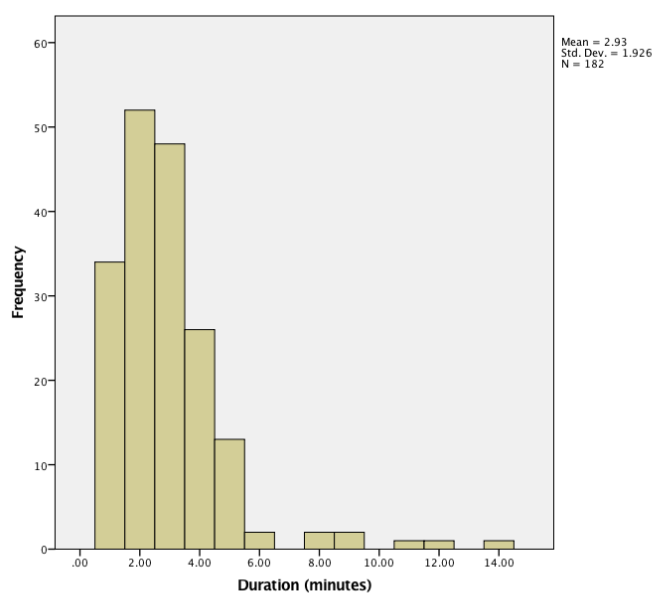


Figure 1: Distribution of Duration for 182 smoking events. The distribution tends toward a Poisson distribution (*Skew*=2.540 (*SE*=0.180); *Kurtosis*=9.812 (*SE*=0.358)).

Table 1: Frequency and percentage of smoker disposal choices (n=217). Discard means to litter, mostly by throwing to the floor. Take-away means the smoker took the remnant cigarette with them, usually whilst finishing it off, and the observer lost sight of the smoker. Other bin refers to the large black local authority bin located outside the station. There were no missing data.

	Discard	Take-away	Other Bin	Microbin
Count	75	13	74	55
Percentage	34.6	6.0	34.1	25.3

The Duration of smoking differed across Disposal class, with those Discarding and those using the Microbins smoking for much longer on average than the rest of the sample. A Kruskal-Wallis test revealed that the distribution of Duration was not equal across Disposal class ($8.081_{3,182}, p=0.044$); however, pairwise comparisons within this sample did not survive adjustment for multiple comparisons. None the less, as can be seen from Figure 2, it is the Take-away class that is driving the overall effect, as the only class not to cross the overall mean.

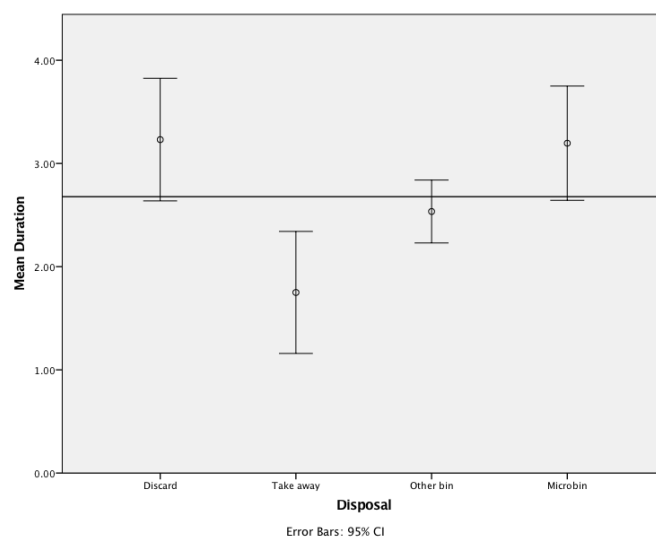


Figure 2: Mean Duration (and 95% Confidence Intervals) of 182 smoking events within each disposal class. The horizontal line is the overall mean duration.

Chi-square tests for association using a Fisher’s Exact method were carried out to investigate the association between Disposal class and Sex, Age, Origin, Group, Movement and Vigilance. There were no statistically significant relationships between Disposal class and Sex, Age or Vigilance.

Disposal by Origin was significant (*Exact value=35.437, p=0.0001*). Figure 3 shows that this effect was driven by the large number of smokers in the Enter category (61.8% of the sample). Odds ratios were calculated for the likelihood of each Disposal class being adopted upon entering the station (Table 3) to further explore this effect. The table indicates that the Microbin category performed less well than Other bin (Figure 3). However, when Microbin and Other bin categories were added together, the OR=3.5. This means that proper disposal is 3.5 times more likely than discarding or taking away at point of entry.

Table 2: Odds ratios (OR) for Disposal class across the Enter category of Origin. The ORs are less than one across all Disposal classes, therefore the 1/OR is the more useful figure, giving information about how much more likely it is that another Disposal class will be adopted. For example, upon entering the station it is 2.94 times more likely that a smoker will dispose of a cigarette in a way other than using the Microbin.

	Microbin	Other bin	Discard	Take away
OR	0.34	0.66	0.53	0.01
1/OR	2.94	1.52	1.89	100.00

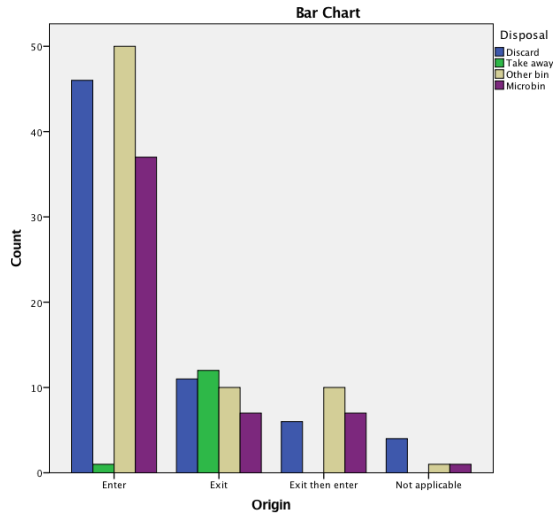


Figure 3: The distribution of Disposal class across Origin. Compare the Enter category with the OR data in Table 2. The likelihood of adopting a particular Disposal class upon exiting the station is much more evenly distributed.

Disposal by Group was significant (*Exact value=7.372, p=0.049*) with more smokers falling into the No category (87.1% of the sample were on their own when smoking). Odds ratios were calculated for Disposal class within those smokers on their own (Table 3, Figure 4). It is apparent that Discard is the most likely outcome for a smoker on their own when the data are broken down in this way. However, disposal in a bin is almost twice as likely as Discard or Take away (OR=1.96).

Table 3: Odds ratios (OR) for Disposal class across the No (Alone) category of Group. The ORs are less than one across all Disposal classes, therefore the 1/OR is the more useful figure, giving information about how much more likely it is that another Disposal class will be adopted. For example, if someone is smoking on their own they are 3.13 times more likely to dispose of a cigarette in a way other than using the Microbin.

	Microbin	Other bin	Discard	Take away
OR	0.32	0.43	0.70	0.05
1/OR	3.13	2.33	1.43	20.00

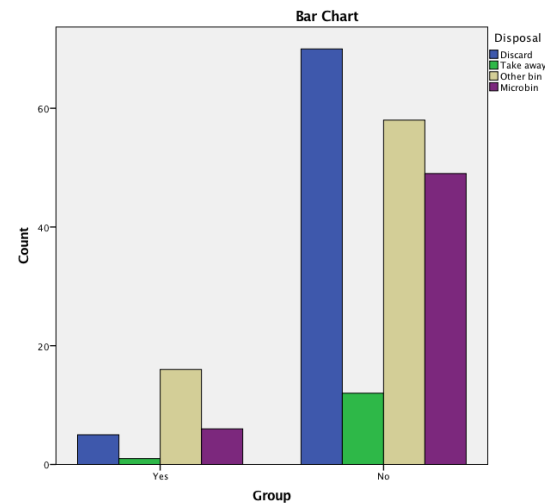


Figure 4: The distribution of Disposal by Group.

Disposal by Movement was significant (*Exact value=13.776, p=0.003*) as 78% of the sample stood still when smoking. Odds ratios were calculated for Disposal class within those smokers who were still (Table 4, Figure 5). It is apparent that Discard is the most likely outcome for a smoker that is Still, when the data are broken down in this way. However, disposal in a bin is more than twice as likely as Discard or Take away (OR=2.19).

Table 4: Odds ratios (OR) for Disposal class across the Still category of Movement. The ORs are less than one across all Disposal classes, therefore the 1/OR is the more useful figure, giving information about how much more likely it is that another Disposal class will be adopted. For example, if someone is Still whilst smoking then they are 2.5 times more likely to dispose of a cigarette in a way other than using the Microbin.

	Microbin	Other bin	Discard	Take away
OR	0.40	0.44	0.72	0.02
1/OR	2.50	2.27	1.39	50.00

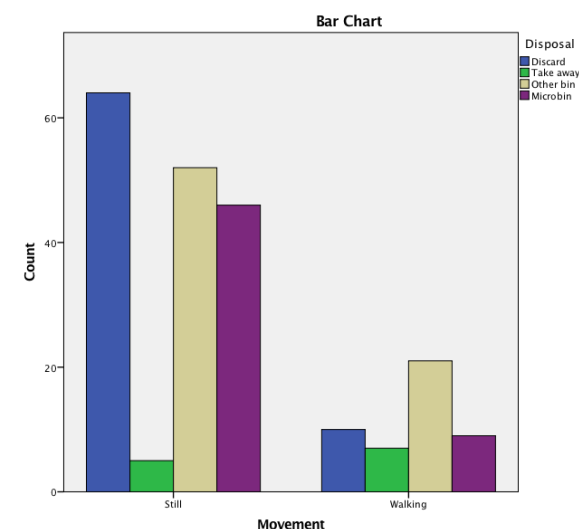


Figure 4: The distribution of Disposal by Movement.

Conclusions/Future Directions

Based on the data collected, the estimated amount of potential smoking litter (number of cigarettes) generated across one year is approximately¹:

- Microbin: 13,636
- Other Bin: 18,346
- Discard: 18,594
- Take Away: 3,223

Overall the data indicate that the Microbins were used less frequently than the two Other standard bins despite there being 7 Microbins and only two Other bins. Smokers may be used to searching for a bin located on the surrounding paved area (where bins are commonly placed) and perhaps not so likely to search for a Microbin attached to the railings. A large, free-standing bin is perhaps more easily identifiable, and thus more frequently used despite being, on occasion, more

¹ Calculated as frequency divided by 13.25 hours x 9 hours x 365 days - rounded up to the nearest whole number.

effortful to get to. Indeed, CG observed that in some instances, individuals would use the Other bins despite being positioned directly next to a Microbin. This suggests visibility may be an important issue. As most smokers smoked whilst standing still, positioning multiple Microbins in close proximity to one another would seem to be an effective approach as this increases the likelihood of an individual being positioned within a short distance of a Microbin. Walking smokers were less likely to use Microbins than still smokers, further supporting the idea that visibility may be important. The presence of additional Microbins may therefore result in increased Microbin disposal rates.

As the findings indicate that individuals were more likely to use the Other bins or to discard than use a Microbin, this raises consideration of the salience of the Microbins. Simple manipulations to the bin liveries, for example, using bold, block colours may render the Microbins more visible to both moving and static smokers. A future trial using bright yellow bin wrappings would be a recommended manipulation as yellow is more easily visible to the partially-sighted. It may also be effective to include a simple black cigarette logo to make clear the specific function of the Microbins. Using a simple coloured strip on the stubbing plates may also draw additional attention to the bins.

A visual example of possible livery manipulations below:



There were two entry/exit points into the station; the main entrance and the side entrance (a ramp walkway accessible for wheelchair users). Although the frequency of each specific entrance/exit was not captured in this study, the researcher observed that the majority of individuals used the larger, main entrance. It is evident that smokers are more likely to dispose of their cigarette butts in one of the Other bins or a Microbin upon entering the station than they are to discard or take-away. This suggests that maintaining the Microbins, which are placed directly in front of the main entrance, would be a beneficial strategy and if combined with a method of increasing their prominence (as suggested above) may increase the frequency of their use.