

# Tools for assessing consensus and adoption of management practices (cigarette butt litter disposal)

Report on Phase 1 of project data collection

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## Introduction

This report describes the first phase of data collection for the MTSRF (Project 4.9.7) extension project entitled '*Tools for assessing consensus and adoption of management practices*'. The background rationale and additional details of the project are available in an earlier report (Stone-Jovicich *et al.* 2010<sup>1</sup>). In summary, the objective of this project is to test a methodology, consensus analysis, developed in cognitive anthropology. The uniqueness of consensus analysis is that it applies rigorous statistical analyses to structured interview data (typically collected in multiple stages with relatively few participants) to assess the extent of knowledge or the degree of shared knowledge within and between groups. It rests on the assumption that the set of beliefs, values and knowledge that individuals use to interpret and respond to the world of experience is learned and, more importantly, shared. Moreover, the extent of sharing of beliefs, values and knowledge varies among individuals. Consensus analysis enables one to investigate the content and distribution (or sharing) of knowledge among individuals. To showcase this technique, we selected as a case study the problem of cigarette butt litter, and strategies for improving their appropriate disposal.

This project aims to determine the range of *beliefs* held by Townsville cigarette smokers in relation to:

- The *contributions* smokers' actions make to reducing cigarette butt litter;
- The *outcomes* that will be achieved through smokers' adopting improved practices;
- Smokers' *ability* to implement the desired actions or activities;
- The *full consequences* of smokers' decisions and actions to reduce butt litter; and
- Smokers' *values* regarding the reduction of cigarette butt litter and the activities they are expected to adopt to achieve that output.

This report presents and discusses data collected for the first phase of the project.

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<sup>1</sup> Stone-Jovicich, S., Lynam, T. and Gooch, M. (2009) *Tools for assessing consensus and adoption of management practices (cigarette butt litter disposal): Survey instrument development*. Unpublished project report to the Marine and Tropical Sciences Research Facility (MTSRF).

## Methods

The methodology used in this project, consensus analysis, typically involves two phases of data collection and data analysis. The objective of the first phase is to elicit more knowledge about the domain under inquiry (in this case the issues surrounding cigarette butt litter) and this generally entails open-ended and semi-structured questions such as free listing. The second phase uses the responses given in the first phase to create a set of structured questions that are analysed using consensus analysis. These include dichotomous, ordering and similarity tasks such as pile sorts, and questionnaires (multiple choice, Yes/No and True/False, paired-comparison, and triadic).

Phase 1 of this project consisted of face-to-face interviews with 24 cigarette smokers located on the James Cook University (JCU) campus in Townsville and at the nearby Townsville General Hospital. Smokers were selected to represent as best as possible a diversity of social and economic backgrounds and life experiences. Students (ranging from first-year students to postgraduates), lecturers and professors, and other staff (e.g. library staff, dining hall staff, cleaning crew, patients) were interviewed. For each of the questions asked, responses were asked to be given in the form of freelists.

## Survey Instrument for Phase 1

The survey instrument used to collect data for Phase 1 comprised eight questions:

1. Please list the problems associated with cigarette butt litter.
2. What actions can smokers take to reduce cigarette butt litter?
3. What are the advantages or benefits of reducing cigarette butt litter?
4. What are the disadvantages or bad things of having to reduce cigarette butt litter?
5. What factors or circumstances would make it easier for smokers to dispose of cigarette butts in a way that does not pollute the environment?
6. What would motivate smokers to dispose of cigarette butts in a way that does not pollute the environment?
7. Is reducing cigarette butt litter important? Why?
8. List the first words that come to mind when you think of efforts that are being done to reduce cigarette butt litter?

The survey instrument was piloted and refined prior to being implemented.

## Results

The data collected was analysed with *Anthropac* software (Borgatti 1996<sup>2</sup>). Analysis of freelists in *Anthropac* generates four pieces of information: (1) frequency (the number of separate items listed), (2) response percentage (the percentage of interviewees who mentioned each item), (3) rank (the average rank for each item), and (4) salience (a measure based on the frequency and rank of each item; it indicates how much knowledge informants share and how important that knowledge is to them).

### *Perceived problems with cigarette butt litter*

The 24 survey respondents identified ten problems associated with cigarette butt litter (Table 1). The most frequently cited problems were 'aesthetics' (mentioned by 54% of all respondents), closely followed by 'pollution' (50%). 'Pollution' was perceived as the most salient problem (as indicated by the highest Smith's S score), i.e. interviewees mentioned it near the top of the list, perceiving it as the most important problem or the problem with which they were the most familiar.

**Table 1:** Results of the analysis of the freelists of 'problems with cigarette butt litter'.

ITEM		FREQUENCY	RESP PCT	AVG RANK	Smith's S score
1	Aesthetics	13	54	1.923	0.365
2	Pollution	12	50	1.333	0.431
3	Affect waterways / reef	9	38	2.000	0.250
4	Impact on wildlife	7	29	1.857	0.215
5	Fires	4	17	2.750	0.073
6	Don't decompose	3	13	1.333	0.115
7	None	1	4	1.000	0.042
8	Neglectful	1	4	2.000	0.031
9	Unhealthy	1	4	3.000	0.021
10	Have to hassle friends	1	4	1.000	0.042
<b>Total / Average:</b>		<b>52</b>	<b>2.167</b>		

<sup>2</sup> Borgatti, S. P. (1996) ANTHROPAC 4.0. Natick, MA: Analytic Technologies.

***Perceived actions smokers can take to reduce cigarette butt litter***

A total of nine actions that smokers could take to reduce cigarette butt litter were identified by the survey respondents (Table 2). Of these, the most frequently mentioned was ‘put [butts] in bin/ashtray’, mentioned by 71% of all respondents (17 people). This was also seen as the most important, or salient way that smokers could reduce litter. ‘Use portable ashtrays’ was mentioned by 38% of respondents (9 individuals) as an additional action that smokers can take.

**Table 2:** Results of the analysis of the freelists of ‘actions smokers can take to reduce cigarette butt litter’.

ITEM		FREQUENCY	RESP PCT	AVG RANK	Smith's S score
1	Put [butts] in bin/ashtray	17	71	1.176	0.646
2	Use portable ashtray	9	38	1.444	0.299
3	Don't throw [butts] out car window	2	8	1.500	0.063
4	Dispose of them properly	2	8	1.000	0.083
5	Keep butt if no bin	1	4	1.000	0.042
6	Keep smoking areas clean	1	4	3.000	0.014
7	Put [butt] back in cigarette packet	1	4	2.000	0.021
8	Smoke less	1	4	1.000	0.042
9	Don't use [cigarette] filters	1	4	2.000	0.021
<b>Total / Average:</b>		<b>35</b>	<b>1.458</b>		

***Perceived advantages or benefits of reducing cigarette butt litter***

A total of 17 different advantages were mentioned in response to the question 'What are the advantages or benefits of reducing cigarette butt litter?' (Table 3). The benefits mentioned covered a broad range of issues, including environmental, social and individual advantages. 'Less pollution' was mentioned the most frequently (46% of survey respondents). It was also identified as the most salient benefit. Other advantages frequently mentioned were 'aesthetically nicer' (33%), 'better for the environment' (29%) and 'better for animals' (17%).

**Table 3:** Results of the analysis of the freelists of 'advantages/benefits of reducing cigarette butt litter'.

ITEM		FREQUENCY	RESP PCT	AVG RANK	Smith's S score
1	Less pollution	11	46	1.273	0.410
2	Aesthetically nicer	8	33	1.750	0.250
3	Better for environment	7	29	1.286	0.250
4	Better for animals	4	17	1.750	0.125
5	Nicer places to smoke	2	8	2.000	0.042
6	Reduced fire risk	1	4	2.000	0.021
7	Better for health of individual	1	4	1.000	0.042
8	Improved reputation of smokers	1	4	1.000	0.042
9	Better waste management	1	4	2.000	0.021
10	Demonstrates a general care for the environment	1	4	3.000	0.014
11	Cleaner	1	4	1.000	0.042
12	Fewer sick people	1	4	1.000	0.042
13	Less effect on asthmatics	1	4	2.000	0.028
14	Better environment for kids	1	4	3.000	0.014
15	Feel less guilty	1	4	1.000	0.042
16	Social benefits	1	4	3.000	0.014
17	Creates jobs (cleaners)	1	4	2.000	0.021
<b>Total / Average:</b>		<b>44</b>	<b>1.833</b>		

***Perceived disadvantages of reducing cigarette butt litter***

Interviewees identified only five disadvantages in having to reduce cigarette butt litter (Table 4). The majority of the people interviewed (79%) believed that there were no disadvantages at all.

**Table 4:** Results of the analysis of the freelists of ‘disadvantages of reducing cigarette butt litter’.

ITEM		FREQUENCY	RESP PCT	AVG RANK	Smith's S score
1	None	19	79	1.000	0.792
2	Annoying for some people	1	4	1.000	0.042
3	Having to find a bin	1	4	1.000	0.042
4	Not enough convenient bins/ashtrays	1	4	1.000	0.042
5	Council cleaners paid with tax money	1	4	1.000	0.042
6	Picking up other peoples' butts	1	4	1.000	0.042
<b>Total / Average:</b>		<b>24</b>	<b>1.000</b>		

### ***Perceived factors that could make it easier for smokers to dispose of their cigarette butts***

There were varying opinions regarding what factors or circumstances would enable smokers to dispose of their cigarette butts in a more environmentally proper manner (Table 5). However, the majority of suggestions revolved around different types of bins/ashtrays and thus was not that divergent. Fifteen factors were mentioned, with the most frequently (and salient) item being 'more butt-out containers' (21% of respondents). Other recommendations included 'making people more aware' (13%) and 'biodegradable filters' (13%).

**Table 5:** Results of the analysis of the freelists of 'factors or circumstances that would make it easier for smokers to dispose of cigarette butts in a way that does not pollute the environment'.

ITEM	FREQUENCY	RESP PCT	AVG RANK	Smith's S score	
1	More 'butt-out' containers	5	21	1.000	0.208
2	More bins	3	13	1.333	0.111
3	More butt bins	3	13	1.000	0.125
4	More ashtrays	3	13	1.000	0.125
5	More ashtrays where people smoke	3	13	1.667	0.097
6	Make people aware	2	8	1.500	0.063
7	More bins with ashtrays	2	8	1.000	0.083
8	Biodegradable cigarette filters	2	8	1.500	0.063
9	Sealed/closed containers	1	4	1.000	0.042
10	Make people more aware	1	4	2.000	0.021
11	Law	1	4	2.000	0.021
12	None	1	4	1.000	0.042
13	Keep community clean of cigarette butts	1	4	2.000	0.021
14	Ways to shred butts	1	4	1.000	0.042
15	More regular cleaning of ashtrays	1	4	2.000	0.021
16	Ashtrays in cigarette packets	1	4	2.000	0.021
17	Designated smoking areas with bins	1	4	1.000	0.042
18	Less flammable butt bins	1	4	2.000	0.021
19	More people quitting smoking	1	4	1.000	0.042
<b>Total / Average:</b>		<b>34</b>	<b>1.417</b>		

***Perceived motivations for smokers to dispose of cigarette butts appropriately***

Survey respondents were asked what would motivate smokers to dispose of cigarette butts in a manner that does not pollute the environment (Table 6). Seventeen percent (four individuals) believed that there was 'nothing' that could motivate smokers to dispose of their cigarette butts. An additional seventeen percent believed that 'fines' would work. 'More bins/ashtrays' and 'education / self awareness' were each also identified by seventeen percent of respondents.

**Table 6:** Results of the analysis of the freelists of 'factors that would motivate smokers to dispose of cigarette butts in a way that does not pollute the environment'.

ITEM		FREQUENCY	RESP PCT	AVG RANK	Smith's S score
1	Nothing	4	17	1.000	0.174
2	Fines	4	17	1.250	0.159
3	More bins / ashtrays everywhere	4	17	1.250	0.159
4	Education / self awareness	4	17	1.500	0.145
5	Pocket ashtrays	2	9	3.000	0.029
6	Peer pressure	1	4	2.000	0.029
7	Common sense	1	4	1.000	0.043
8	Biodegradable cigarette butts	1	4	1.000	0.043
9	Advertising campaigns	1	4	3.000	0.014
10	More cleaning-up of butt litter	1	4	2.000	0.022
11	Lower the cost of cigarettes	1	4	1.000	0.043
12	Having [phone] number to report offenders	1	4	1.000	0.043
13	Laws	1	4	2.000	0.029
14	Being told off by members of the public	1	4	1.000	0.043
15	Education	1	4	1.000	0.043
16	Make people responsible for their cigarette butts	1	4	2.000	0.022
17	Reward	1	4	1.000	0.043
18	.05c deposit on cigarette filters	1	4	1.000	0.043
19	Information on effects of cigarette butt litter	1	4	1.000	0.043
20	More conveniently located ashtrays	1	4	1.000	0.043
21	Community campaigns	1	4	2.000	0.022
<b>Total / Average:</b>		<b>34</b>	<b>1.478</b>		

***Perceived importance of reducing cigarette butt litter***

Interviewees were asked if they believed reducing cigarette butt litter was important. With the exception of one individual, who did not think it was important, the remainder (96%) stated that they thought it was important (Table 7). The most frequently mentioned, and most salient, reason they gave was that it was “better for the environment” (mentioned by 54%). They listed an additional six reasons why it was important (‘aesthetically nicer’, ‘less pollution’, ‘better for animals’, ‘reduces risk to kids’, ‘because “I don’t like it”’, and ‘better for smokers’). Two individuals did not give any reason and one individual felt that while it was important it was a ‘useless cause’ to try to reduce cigarette butt litter as there will always be smokers who pollute.

**Table 7:** Results of the analysis of the freelists of ‘importance of reducing cigarette butt litter important?’

ITEM		FREQUENCY	RESP PCT	AVG RANK	Smith’s S score
1	Better for the environment	13	54	1.000	0.542
2	Aesthetically nicer	5	21	1.400	0.174
3	No reason given	2	8	1.000	0.083
4	Less pollution	2	8	1.000	0.083
5	Better for animals	1	4	3.000	0.014
6	Reduces risk to kids	1	4	2.000	0.021
7	Not important	1	4	1.000	0.042
8	I don’t like it	1	4	1.000	0.042
9	Better for smokers	1	4	1.000	0.042
10	Useless – others pollute with butts	1	4	1.000	0.042
<b>Total / Average:</b>		<b>28</b>	<b>1.167</b>		

**Words used to describe current efforts to reduce cigarette butt litter**

Survey respondents were asked to list the first words that came to mind when thinking about current efforts being made to reduce cigarette butt litter (Table 8). Four people (17%) did not list anything; another 17% believe that 'not enough' is being done; closely followed by the need for 'more bins' (13%) and 'advertising' (13%).

**Table 8:** Results of the analysis of the freelists of 'list the first words that come to mind when you think of current efforts to reduce cigarette butt litter'.

ITEM		FREQUENCY	RESP PCT	AVG RANK	Smith's S score
1	Not enough [is being done]	4	17	1.000	0.167
2	None	4	17	1.000	0.167
3	More bins	3	13	1.000	0.125
4	Advertising needed	3	13	2.333	0.079
5	Not effective	2	8	1.000	0.083
6	Needed	1	4	2.000	0.021
7	No butts	1	4	1.000	0.042
8	Posters	1	4	1.000	0.042
9	Insufficient	1	4	1.000	0.042
10	Heaps of ashtrays on [The Strand, Townsville] but not in other places	1	4	1.000	0.042
11	Council	1	4	1.000	0.042
12	Government	1	4	2.000	0.033
13	Public responsibility	1	4	3.000	0.025
14	Are there any?	1	4	1.000	0.042
15	Education needed	1	4	5.000	0.008
16	Put [butts] in bins!	1	4	1.000	0.042
17	Fewer people smoking	1	4	1.000	0.042
18	Changing laws	1	4	2.000	0.021
19	Good luck!	1	4	1.000	0.042
20	Campaigning needed	1	4	1.000	0.042
<b>Total / Average:</b>		<b>34</b>	<b>1.478</b>		

## Phase 2 Data Collection

Phase 2 of our work will draw on the information generated from analysis of the freelists presented above. A second sample of some 30-50 smokers on the James Cook University campus and within of the larger population of Townsville will be asked to respond to a short questionnaires and/or pile sorts.

The questions, or issues, which provided the most diverse and rich set of responses in Phase 1 of the project will be selected for Phase 2. The decision to eliminate some questions or issues (e.g. the disadvantages of reducing cigarette butt litter) is based on the fact that Phase 2 data collection methods may be time consuming and cumbersome for participants. Additional information on the questions/issues that are selected will be collected via a questionnaire and piles sort exercises. The questionnaire will consist of lists of the responses that were most frequently mentioned in Phase 1 and respondents will be asked to rank the items in order of importance or asked to answer 'Yes' or 'No'.

After completing the questionnaire, each respondent will be asked to participate in pile sorting exercises, each focused on a different issue (e.g. problems associated with butt litter, actions smokers can take to reduce butt litter, etc.) For the pile sorting exercises, the most common responses to Phase 1 survey questions will be written on separate index cards. Respondents will be given the stack of cards, each containing a single word or phrase (with an identification number written on the back), and asked to organise them into groups, or piles, on the basis of similarity.

The data collected with the questionnaire and pile sorts will be analysed using *Anthropac*. The data will be converted to aggregate proximity matrices of survey respondents and analysed with consensus analysis (a module in *Anthropac*). The consensus analysis module applies minimum residuals factor analysis to interviewee responses. The analysis of the data will result in a quantitative measure of the level of consensus among smokers in Townsville with respect to the key questions outlined above. We will also ask respondents socio-demographic questions which will enable us to determine the extent to which smokers of different socio-economic status, gender, and other key social characteristics share common beliefs and values in relation to butt litter and strategies for improving their disposal.