Patterns of conservation and domestic water use in different cultures: a comparison between Mexico and the UK

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ABSTRACT

Most water-related behaviours in the home happen as routines that are shaped by a series of circumstantial factors that can be perceived to have similarities within certain groups of people. The paper presents findings from an on-going PhD project, which is looking to provide an understanding of the influence of cultural background on designing products and services for sustainable behaviour in regards to water use.
The paper reflects on the process of data collection through an online questionnaire and the administration of cultural probes in both the UK and Mexico. It argues the complexity of water use/waste whilst doing the dishes, partly derived from the cultural, behavioural and geographical circumstances, which also have an influence on the perception of personal use of water in the home. It concludes by outlining opportunities for using these insights of cultural influence on washing up habits to support the design of products that can lead to a more sustainable use of water.

Keywords: cross-cultural research, design methods, household routines, sustainability

1 INTRODUCTION

It is becoming more widely recognised that understanding user behaviour can help improve the environmental impact of products and services (Jackson and Michaelis, 2003; Lehman and Geller, 2004; OECD, 2008). This paper presents on-going work as part of a 3-year PhD research project that builds on the hypothesis that *cultural background largely influences human behaviour and as a result, plays an important role in water consumption patterns in the home and their evolution — natural, intended or forced.* It focuses specifically on the dishwashing processes.
Most water related actions at home are complex routines divided into little practices that people do on *'auto-pilot'* most of the time (Schatzky, 1996). Human behaviour often consists of several habits which are developed individually over time in order to feel in control and achieve a balance in the environment. As such, water-related behaviour needs to be studied in context and not as an isolated event. Routines develop from childhood, with the influence of the family and the environment (Gram-Hanssen, 2008), evolving with the ever-changing circumstances in daily life (Medd and Shove, 2005). Some factors that influence the evolution of routines and patterns are presented in Figure 1. Although routines and habits are unique and personal, similar patterns can be grouped into different behaviour-styles.

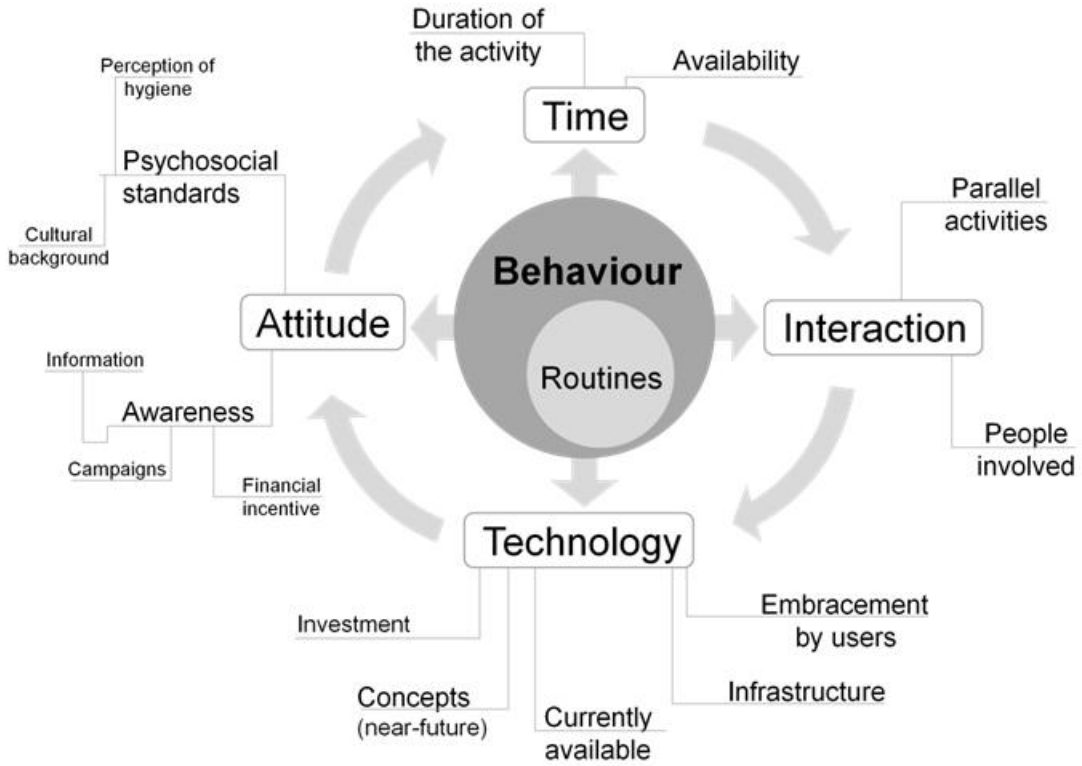

Figure 1. Factors influencing the creation of patterns and routines. (Elizondo and Lofthouse, 2010)

Water consumption is usually not striking to the eye: most of the time with today's busy lifestyles, people are not fully aware of the amount of water consumed (Randolph and Patrick, 2008), nor in which activities they consume the most. People's perception towards cleanness and hygiene is a critical factor in water-related behaviours and routines, as it has a major influence on the frequency, duration and resource consumption during the activity (Hand et al., 2003; Hielscher et al., 2008). Hygiene can be considered as a relative term, as it is influenced by local and temporal circumstances. An example of this is given by Hielscher *et al*. (2008) in a study in the hair-care field: clean hair is sometimes thought of as hair with no dirt, or hair with no odour, or hair with some perfume from shampoo or conditioner. An analogous example can be given with the perception of cleanness in clothing or dishes; the latter will be presented in this paper.

This work aims to explore the impact of cultural background on the development of (un)sustainable routines, by using washing-up routines and water use perceptions in the UK and Mexico as a case study.

2 RESEARCH DESIGN

Mexico and UK were selected as the sites to carry out the study as they offer significant cultural differences and conditions of water availability. The researcher had good access to both sites and both were considered suitable in terms of the resources and the timeframe available for the research.

Despite these differences, increasing government focus on domestic water saving actions is given in both Mexico and the UK. Many recommended actions are shared, such as turning the tap off whilst washing one's teeth, or when shampooing; using a water saving device in the toilet cistern; or running the washing machine only on full loads (CONAGUA, 2010; Directgov UK, 2009). It is interesting though, how the recommendations about the dish-washing process have different

approaches — shown in Figure 2— as the dishwashing process itself in the two countries is different. Even though both countries are commonly considered to have what could be referred to as 'western ways', the process of washing-up often involves different ground rules and tools for each culture. This paper explores those variations using an ethnographic approach.

Figure 2. Examples of official recommendations for a responsible use of water whilst dishwashing - UK and Mexico. (Clift and Cuthbert, 2009; CONAGUA, 2009; CONAGUA *et al.*, 2006; CONAGUA, 2010)

3 METHODOLOGY

In order to gain more detailed insights into the lifestyles of people and their particular practices related to dishwashing, and as all data was to be collected from inside people's homes; it was considered that an ethnographic approach would suit best. A mixed methods approach was selected, using an online questionnaire and a set of 'cultural probes'. Duplicate data collection methods were created for Mexico and the UK in Spanish and English respectively. Validity was sought by triangulation (Silverman, 1993), overlapping the issues looked upon in both data collection methods, with a later informal interview with the cultural probes participants; which served to clear any possible ambiguous interpretation of the diary entries and photographs.

3.1 The questionnaire

A questionnaire was designed to capture people's general views and perceptions of activities that use water in the home. The questionnaire was set up both in English and Spanish and distributed via the internet, allowing a parallel geographic coverage in the two countries, and giving the option to the respondent to answer the questionnaire at their convenience. Themes in the questionnaire

included dishwashing, laundering, toilet usage and showering, appliances in the home and general perception of water use and conservation. Respondents had to be originally from, and live either in UK's Midlands region or Northern Mexico.
A hundred and seven answers came from the British questionnaire, which were reduced to 98 after deleting non-British respondents and respondents outside the geographical area looked upon. The Mexican questionnaire got 133 responses with 115 that met the criteria. The results of the analysis of the questionnaire were used to inform the design of a more specific and deep study based on cultural probes.

3.2 Cultural probes

Cultural probes are a qualitative data collection technique first developed by Gaver *et al*., (1999). They are particularly useful when investigating and exploring domestic life, especially in sensitive or intimate activities (Kjeldskov *et al.*, 2004). Cultural probes provide good complementary information to more traditional user study methods such as interviews or observation as they support self-reflection and documentation of the participant's part (Kjeldskov et al., 2004). They are normally designed by the researcher, and given out to the volunteers, encouraging them to collect the data themselves. Probes are a good way to collect information (qualitative) over a certain period of time and in multiple locations, using fewer resources than other ethnographic approaches (Hemmings et al., 2002).
For the purpose of this research, the probes were meant to capture all sorts of ideas and thoughts on dishwashing, and reflect on the types of patterns that people follow. The probe pack given to the participants was designed to facilitate people's expression on specific matters that were important for the research and that may otherwise be considered as irrelevant by the volunteers. Figure 3 shows the elements included in the probe, as well as the cover of the diary and a spread from a specific day.

Figure 3. Probe pack: Diary, photo task, disposable camera, pen, fridge magnet prompt, magnetic clip, magnet

The data was complemented by a 36-hour video footage of people's kitchen sink, which was later analysed searching for particularities and similar patterns between the households in each country. The probe pack incorporated a diary and a disposable camera with a 21-photo task list. The design of the diary had an informal approach, and used colours, images and a display of information to prompt, captivate and engage the respondent. Blank spaces were also provided to incite people to express themselves by scribbling and drawing. These spaces were not used by all the households, but when used, they brought interesting and useful extra data that enriched the analysis. The diary was divided in seven different spreads, one for each day. They all had different entries and different photo tasks to complete, all united in the common theme of dishwashing.
Thinking that most activities related to the probe pack would be carried out in the kitchen, and with the premise that fridges are something people see all the time, respondents were given a reminding **fridge magnet**, an extra **photo task list** and a **magnetic clip for the diary**, so that they could have all the elements prompted every time they passed in front of the fridge.
This stage of the study involved six households in North Mexico and six in UK's Midlands, in the following categories of household:

- Single occupancy
- Double occupancy (couples)
- Shared house (+3)
- Small family house (couple +1)
- Bigger family house (+3)
- Family house with grown children

A flyer describing the project was distributed mainly via the Internet to get the attention of possible participants. The households that expressed their will to participate were approached during an informal meeting on site, where she provided the cultural probe pack and explained all elements involved, setting also the dates for the video recording. A one week project was set with the different elements of the probe. The timeframe of seven days was thought to be long enough to gather different circumstances in the synergy of the household, without making it a too long and effort-needing task so that people would grow bored of it and stop using it. Responsibility of the completion of the probe kit was given to one person in the household, which generally turned out to be the responsible female.

3.2.1 Analysing the Probes

Gaver *et al.,* (2004) use probes for inspiration: "the probing process and the accumulated material provided a source of inspiration for the designer when they worked out concepts visualizing alternative futures". They did not analyze the probes, they only "wanted to dive into the material in order to come up with their own ideas, and to develop and share stories that sparked off new ideas" (Mattelmäki, 2006:43). Wensveen *et al.,* (2004) used the probes as a basis for 'imaginary situations', to empathize with families and their need to stay in touch. For the purposes of this research, the probes were adapted to a different context (washing up in UK and Mexican households); the aim being to build different scenarios based on the data collected, and then to use these scenarios to aid the design of products for sustainable water consumption.
Building Personas or *fictional* people (Pruitt and Grudin, 2003) was considered to be a good way to gather together the data from the different elements of the probes, as many particularities were found in the patterns and perceptions of the participants, and the richness of the visual data from sketches, photos and videos produced could be fully visualized in the form of Personas. Using the data collected from the diary, that from the interviews and the data from the videoing and disposable cameras, a profile for each person was built.

4 FINDINGS FROM THE QUESTIONNAIRE

As mentioned earlier, the questionnaire covered a range of water use activities in the home; however for the purposes of this paper, only issues relevant to washing-up are presented. As such, the analysis will discuss the responses of both Mexican and UK participants with regards to issues such as the factors that people believe to influence their behaviour towards water usage, use of electric dishwashers and house-help, and the similarities found in the washing up patterns in each country.

4.1 Influential factors on water conservation

People were asked to rate the influence that certain factors have on their motivation to use water responsibly; climate change, cost of water bill, regional water scarcity situation, example for youngsters, and '*the right thing to do'*. In general, Mexicans responded with high concern to all categories, whilst British answers were more evenly distributed. 60% of Mexican respondents categorized regional water scarcity as a high influential factor, whilst in contrast 77% of Britons consider it to have no influence at all. A similar situation appeared with other factors like *'doing the right thing'*.

This possibly suggests that the geographical differences along with local climate change the way people perceive water. This notion is also backed up by findings in the literature (Kindler and Russell, 1984 cited in Dworak *et al*., 2007:21).

Water abstraction levels per capita in the two countries have large differences in numbers; Mexico abstracts more than double the amount of water than the UK per inhabitant (OECD, 2009). This is particularly interesting when regarded from a water stress perspective, as two thirds of Mexico are under a serious water stress, whilst a larger part of England is considered as a low water stress region overall. The focus areas for this research are the Midlands and East Anglia (for England) considered as moderate water stress regions, and the North/Northeast Mexico, with a serious water stress scenario (see Figure 4).

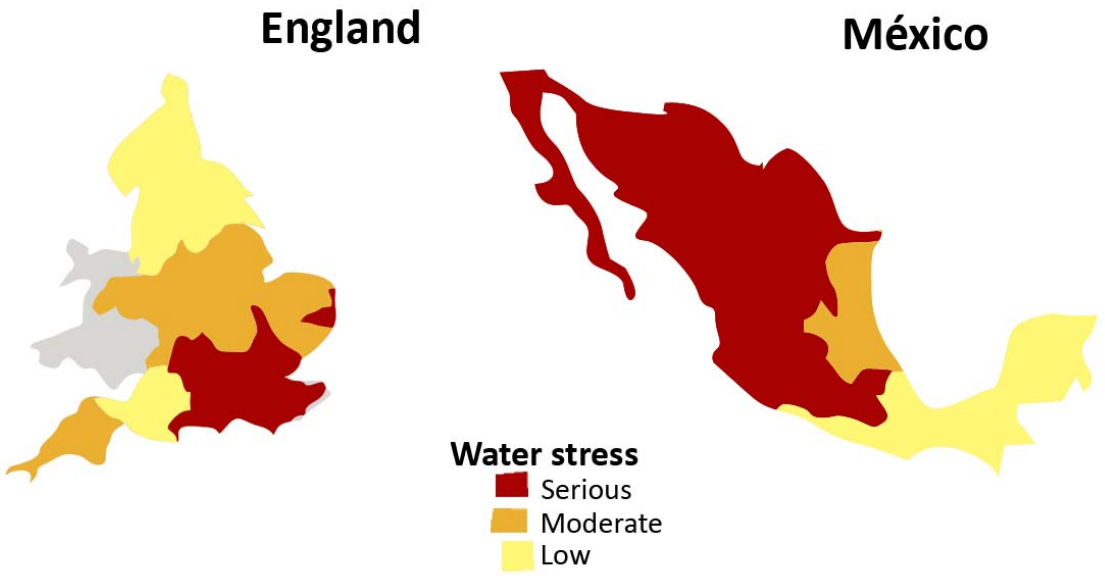

Figure 4. Water stress regions in England and Mexico. Adapted from (Environment Agency, 2007:9; Sistema Nacional de Información del Agua, 2008:159)

'Water stress is related to the amount of water available per person for a given area, both now and in the future. An area of serious water stress is defined as an area where the current household demand for water is a high proportion of the current effective rainfall or, the future household demand for water is likely to be a high proportion of the effective rainfall available to meet that demand. When the demand for water is high or growing, this can result in a serious level of stress on the available water resources'. (Environment Agency, 2007:4)

No real conclusion could be made at this stage, as people's actions are often different from what they say. In both countries, 70% of the respondents considered themselves as water conscious when using water at home. One could argue that 'using water responsibly' potentially has different meanings for one and the other sets of respondents, or even between members of the same group. The fact that Mexicans expressed high commitment to most causes suggests the answer may be a reaction to '*what you want to hear from me*'. Possibly a different wording of those specific questions could have hidden the purpose of the whole survey (water+sustainability) so that responding with 'no influence' or 'low influence' would not sound as if they are careless or bad citizens.

4.2 Owning a dishwasher and having house help – social matters?

Mexico is considered as a developing country, and has a lower average income than the UK (CIA, 2009). It is not unusual then that from the questionnaire applied, a majority of the UK respondents (58%) have a dishwasher and only 12% of the Mexican respondents do. Paradoxically, 60% of the Mexican respondents have house-help, with 41% of those households having it daily; whilst only 15% of the UK respondents have some sort of house help, though 81% weekly or less frequent and none of them daily. This raises the question if whether the economic situation can indeed be considered as the crucial factor for this matter; and if it could possibly be a combination of other factors such as culture, the way society is formed and has evolved, or the local history?

Interestingly, one of the Mexican respondents said:

"In Mexico almost nobody buys a dishwasher, the ones with enough money to buy them have someone to do the dishes for them, so they don't need it". It is perhaps embedded in the culture.

Although there are some interesting discussions and perspectives, there is no agreed-upon weight of certain different influential factors on sustainable behaviour on the washing up process, as it is an activity that varies from person to person, it has become difficult to arrive to an agreement. Having house help, just as renting a place instead of owning one, have before been commented as factors that might compromise sustainable intentions/behaviours (Gilg and Barr, 2006). Just as using a dishwasher with full loads has been recognized to be less resource consuming than washing dishes by hand (Stamminger *et al*., 2004).

4.3 The 'Mexican way' and the 'British way'

Regarding the particularities of the dishwashing process in each comparing site, the questionnaire threw some interesting results. Seventy percent of British respondents use a washing up bowl when washing up by hand, which they *"fill up with hot water, and soap, wash up stuff; once water is dirty, repeat (if needed)".* Interestingly to the (Mexican) author, 57.7% of the British respondents don't rinse the soap off from most items, from these, 37% rinse off when washing glassware. From the Mexican respondents, none of them said they used a washing up bowl or filled up the sink, they would make reference only to the taps and a small container with a solution of water and liquid soap. This was later investigated in the cultural probes, from which visual images could be drawn, giving a more clear explanation of the processes used in each country.

4.4 Questionnaire discussion and follow up

The questionnaire was not intended to draw sweeping statements from the two countries' population, as that would be an oversimplification of the subject, as the sample taken is not representative of all household composition or all socio/economical stratus. Nevertheless, the

analysis did succeed in bringing up different and interesting points, which were used to build the cultural probes upon, and collect more information about them.
The question of which of both approaches to washing dishes by hand is more sustainable still remains unsolved, as no quantitative data of water usage was gathered in the questionnaire. The cultural probes give a more complete idea of the washing process –through people's comments and observation– suggesting a possible answer to this query. One must have in mind that even with similarities in the process, there are no identical approaches to dishwashing, as it is an activity that varies according to the circumstances. Only an electrical dishwasher could be said to have the same resource consumption every time used, although the amount of items washed remains always a variable.

5 INSIGHTS FROM THE CULTURAL PROBES / PERSONA BUILDING

The findings of the cultural probes, enriched with the data collected from the questionnaire, were successful in generating a variety of insights into both cultures. Mexican respondents had patterns in common that at the same time differed from the English ones; this allowed the researcher to '*divide*' the respondents according to the similarities in their washing-up practices. Respondents fell into two main categories, aligned with their own nationality.
The most significant difference found in the washing-up practice is particular way of using soap, illustrated in Figure 5 by media taken from the probes. Mexican participants prepare a solution of soap by half-filling a container with water and a squirt of liquid or powder soap, in which they would immerse the sponge and then scrub/soap dishes, repeatedly dipping the sponge whilst soaping dishes, and replacing the solution when it showed signs of dirtiness.

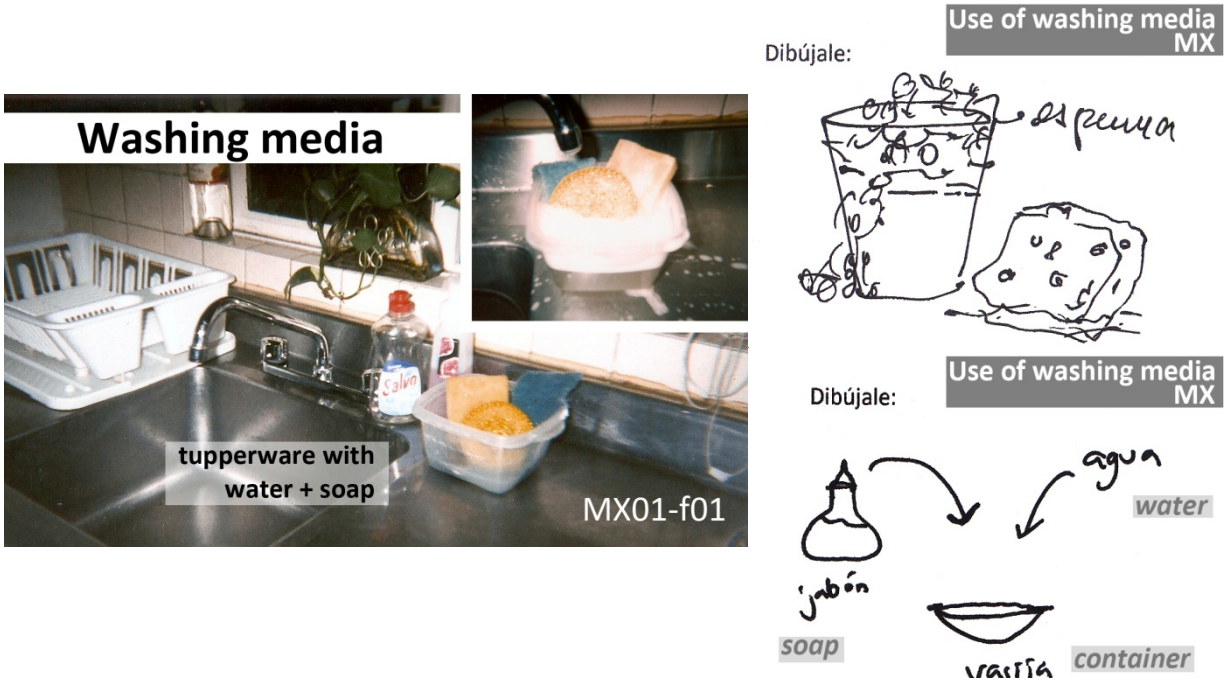

Figure 5. Washing media ready to be used, photos and drawings adapted from cultural probes - MEXICO

Mexican participants would all use the same method for soaping, but would sometimes differ in the use of water: some would soap dishes under running water, rinsing at the same time and placing to dry, whilst others would soap all dishes in one go with a closed tap, and then open the tap and rinse off the suds from each item one by one, also placing them in a drip-drying area at the end.

The British participants generally used a dishwashing bowl and/or the plug set on the sink (Figure 6), a practice that was not present in the Mexican participants of the probes, nor in the Mexican respondents to the questionnaire.

Figure 6. Washing media ready to be used, photos and drawings adapted from cultural probes - ENGLAND

Nearly 50% of the British participants had a dishwasher, in line with the findings from the questionnaire. Nevertheless, most people would hand-wash certain items, such as big pots and casseroles. Another trait distinguished in the *'British way'* was the practice of placing items to drip-dry after soaping/scrubbing in the washing-up bowl, without rinsing the soap with new water. Five of the 7 probes in England (71.4%) had this trait, two of them rinsing only when it comes to glassware, for visual purposes —all Mexican participants rinsed off the soap. The numbers remain coincidentally not far from the non-rinsing percentage of the questionnaire (57.7%). Evidence supporting the impression of it being a common practice was found in *Fairy Liquid* advertisements (1967-1970's) —a popular dishwashing product — that have shown the same 'method' of washing items throughout decades: in a full sink with soapy water, placing aside to drip-dry with no further rinsing (see Figure 7).

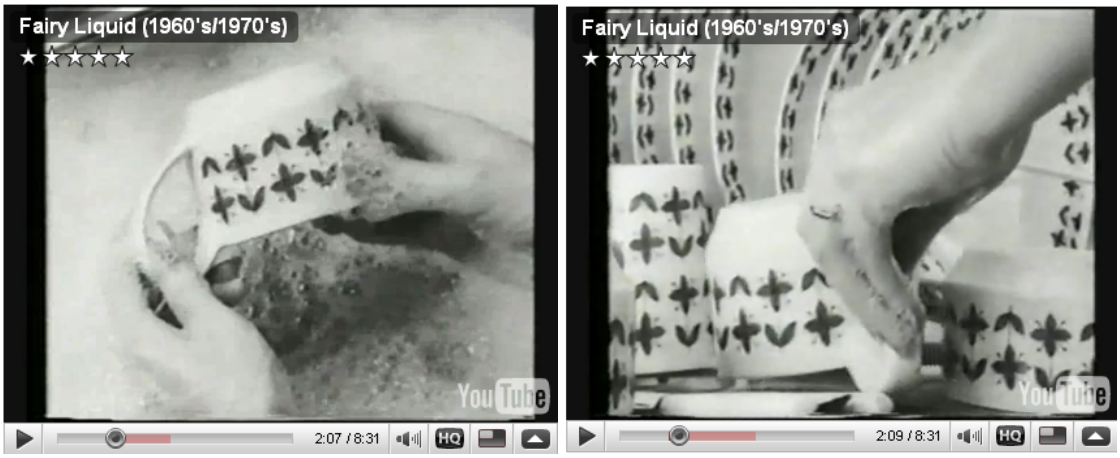

Figure 7. Fairy liquid advertisement snapshots. From (Fairy Liquid, 1967-1970's)

Even though it is not feasible to generalize the washing up practices for all Mexicans and all English people, the study has demonstrated that one could still make the distinction between the two country practices if regarded in an overall fashion. Many other different traits have been recognized in both countries, such as the different and unobvious uses that people give to their kitchen sinks and the distribution of the work-spaces in the kitchen; the amount of soap used in both countries and the importance of the foam that it produces during the washing up process, and the perceived relationship between the later and the grade of hygiene achieved.

It was also considered that the washing up practices also vary with the type of *cuisine* proper of the region. The Mexican cooking of participants showed to be more greasy and colourful (sauce-wise) than the English one, and that could be a reason for which the Mexican wouldn't consider using a bowl full of water to soak all their dishes, as the water would very soon become dirty to the eye, and it would be pointless to try to wash the items under such conditions.

The personal differences between the participants can be seen in the logistics of the dishwashing process, such as the number of times and the duration of the opening-closing of the tap, some due to the kitchen distribution, having a single or double sink, and due to the different context where the activity is developed.

6 CONCLUSIONS, CURRENT & FUTURE RESEARCH

The questionnaire gave the researcher a good grip of the context in which the water actions in the home take place, and from it, cultural probes in the specific topic of washing-up practices were developed.

Although collected from a small number of participants in both countries, the probe packs were successful in generating a variety of different insights on styles and practices of washing-up representative from each 'culture'. The different elements from the probes resulted in a rich source of data that was well complemented by the findings from the questionnaire.

The final aim of this research is to make a link between cultural background and the design of products that encourage more sustainable behaviour. No research has been found to exist in this area nevertheless the subject is starting to get attention, with some parallel studies being carried out by Matsuhashi (2009), looking at cultural diversity as a source of inspiration for designing sustainable practices.

Further work is being carried out in deepening the analysis of the probes, questionnaire and informal interviews, and presenting the findings in the form of Personas. These Personas are intended to be used as supporting media that will aid the process of design with intent for sustainable water consumption in washing-up. During the next steps of the project, UK and Mexican designers will develop products/concepts for their own culture aided with the respective support media given. This will help to establish the opportunities and restrictions from a design perspective associated with designing for behavioural change of specific cultural background target users.

7 ACKNOWLEDGEMENTS

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