

Energy savings by applying the commitment theory

Dominique FLAHAUT, Agence Régionale de l'Energie (ARENE)

Jean-Michel GRAILLAT, Agence de l'Environnement et de la Maîtrise de l'Energie (ADEME) - Délégation Provence-Alpes-Côte d'Azur

Jean-Léon BEAUVOIS, Nice University

Robert-Vincent JOULE, Provence University

1. SYNOPSIS

The paper presents the authors' actions to test and evaluate a way based on commitment theory to change behaviour in order to promote energy savings.

2. ABSTRACT

ARENE, regional energy agency, was willing to work on the subject of energy saving behaviour. Taking account of a previous experiment led by 2 university professors in a hospital for ADEME, ARENE financed a research conducted among families in the Provence-Alpes-Côte d'Azur region.

The research presented is:

An inquiry of 72 families to evaluate the modification of their energy saving behaviour.

The results show that these commitment processes change both attitudes and behaviour desirably. After the action, people found that energy savings are more important, more justified and easier than they imagined. Moreover, they committed themselves to further savings more "costly" (e.g.: using CFLs).

Saving energy this way is costly (because each family must be interviewed twice) and cannot be replicated easily, so our following goal is now to launch another experimental approach in towns.

The paper will conclude with a series of proposals to achieve energy savings through widespread behaviour changes.

3. INTRODUCTION

When observing the increase in energy consumption despite the ever greater efforts made on the efficiency of equipment, one cannot help but wonder about the question of behaviour (even if we can imagine that more appliances increase consumption independently of the individual appliances' efficiency and also independently of saving behaviour).

ARENE tries to work about this question. It launched a call for tenders for French research companies (and international but no one answered).

Most of these companies proposed conventional manners (sociologic analysis, segmentation, definition of messages), only professors Joule and Beauvois¹ proposed an approach based on commitment theory. It is what is described below.

4. COMMITMENT THEORY - A BRIEF DESCRIPTION

Commitment theory explains how people who are brought to make a seemingly insignificant action ² carry out even more difficult actions ³ only if these innocuous actions were performed under certain conditions (called commitment conditions).

This theory explains how attitudes (opinions, beliefs, ideas, judgements) align themselves *a posteriori* on behaviour. Commitment theory thus allows interventions on behaviour and attitudes, rejecting the assumption which has been amply invalidated in reality: in order to change behaviour, just change attitudes.

In the field of energy savings, the question of changing mentalities - and more particularly behaviours - is obviously at the heart of the problem.

Commitment psychology provides an original answer to this question, which concerns everyone. Indeed, several decades of research have shown that people can be influenced in their convictions, their choices and their acts without having to apply *authority*, nor even *persuasion*.

Authority is unquestionably effective in affecting behaviour; indeed, it usually suffices to give an order to be obeyed. There is no doubt that the best way to reduce traffic violations is to have a policeman every ten metres along the road. But authority has its limits, and behaviours achieved through authoritarian measures do not lead to changes in mentality which would ensure that the bad habits do not return once the threat is gone.

Persuasion can be highly effective in modifying the ideas someone has on one question or another. Unfortunately, unlike authority, it is less so when it comes to obtaining precise behaviour, especially when seeking to break old habits as is the case, for example, in modifying daily behaviour to save energy.

It is therefore hazardous to bet on the virtues of authority and persuasion when seeking long-term effects or when trying to affect people's behaviour and ideas at the same time. That is why we feel it is of interest to use strategies of **freely consented submission** (cf. Joule and Beauvois, 1998). Rather than forcing or convincing, it is a question of obtaining acts which, *a priori*, are insignificant, but which nonetheless lead the person who carries them out to think and behave differently in the future. This procedure is in contrast with the aforementioned in the status given to the action: acts are not supposed to result from ideas but rather precede them.

5. HOUSEHOLD MOBILISATION CAPACITIES

Procedure⁴

Our objective was not to demonstrate scientifically the efficiency of commitment theory (already made). The study, carried out in 2000, had 2 objectives:

- **A.** An analysis of the relationship between households and their home energy consumption.
- **B.** An evaluation of household mobilisation capacities in the Provence-Alpes-Côte d'Azur region for the global stakes underlying controlled energy use (from a sustainable development outlook).

For **objective A.** (analysis of the relationship between households and their home energy consumption), an inquiry was carried out that was based on actual behaviour so as to delimit the behavioural world (doing something, such as lowering the thermostat or not doing something, such as not switching on a second bedside lamp), behaviours in relationship with controlled energy use in the home. This behavioural world consists in concrete acts which are performed automatically, or voluntarily, by one or more members of the family. These are acts which are sanctioned by expenses or by savings; the latter can be ranked from the easiest to achieve to the most difficult. The goal is thus to develop a sort of ethnography of family practices in the area of energy consumption. This description of family practices must be considered as a preliminary to objective B and prospectively for possible interventions on behaviour.

For **objective B** (evaluation of household mobilisation capacities) we tested household mobilisation capacities relying less on the measurement of attitudes toward energy savings, ecology, etc. as is usually done, using strictly behavioural indicators instead. Thus, we met twice with the households involved in the study. During the first meeting, the aim was:

1. To obtain information in relation to objective A.
2. To ask them to perform an act (or two or three acts ⁵) systematically over the following two weeks, the act being *a priori* insignificant but not systematically performed before. This request was made following the rules laid down by commitment theory (notably, freedom to choose). This initial contact was also the opportunity to give the families, under conditions which were also commitment conditions, documentation (drawn up by QUERCY Energie and giving ARENE's address) which could help them to find justifications? (technical, economic, ideological) which applied to them and could help to perpetuate new family practices.

During the second meeting, we made sure that the act that the family had committed itself to performing had indeed been performed. This was also a way of seeing whether new controlled energy use behaviours - which had not been requested - had appeared (the so called foot-in-the-door with implicit request effect). Actual performance of the act, on the one hand, and the production of new behaviours, on the other, provided two indices of population mobilisation capacities. A third consisted in the family's acceptance, at the end of the second meeting, of a behaviour that is more "costly" for the family ⁶, i.e. more difficult to carry out and therefore to achieve. Telephone contact was made one month later to find out whether this behaviour had actually been achieved or not. ⁷

Although we were mainly concerned with behavioural change, we did not forget to collect attitudes for control and comparison: a flexible set of attitude scales presented twice, at the beginning of the intervention, during the first meeting (pre-experimental measurements) and at the end of the intervention, at the end of the second meeting (post-experimental measurements).

Population studied

Aix	28	low standing	30
Marseille	10	medium standing and +	31
Nice	35	individual home	12

Mothers	49	Socio-economic level -	20	=> 30 years old	16
Fathers	18	socio-economic level +/-	28	31 to 50 years old	36
Couples	6	socio-economic level +	25	51 =>	21

Results

These concern 73 homes. The information was obtained from mothers (49), fathers (18) or couples (6).

The notion of "energy savings" usually corresponds to acts performed (for example: switching off unneeded lights) or not (for example: not wasting warm water). It appears that people are quite familiar with the range of behaviours that affect energy consumption *but the impact of certain actions in terms of energy consumption is less well known*. While certain energy-saving acts are used by many people (wait until there is enough dirty laundry before running a machine applied by 50 people, for example), "costly" *behaviour can also be observed among a large number of people* (airing out for more than 5 minutes for 46 of them, for example).

Economic motivations lead the way, 20 spoke about them, 10 spoke of waste and only 7 brought up ecological motivations.

Discussions of their last purchase of an appliance showed that concerns for energy savings are not prevalent (61 people claimed that this concern had not entered into their purchasing decision, only 8 claimed to have had this concern).

Two subsidiary questions confirmed this. *Only 13 people knew the power used by their microwave oven, and 20 people were able to evaluate the temperature of their living room correctly.* The complete analysis showed that, in winter, people tend to underestimate the temperature of their home.

6. REFLEXES QUICKLY ADOPTED, SAVINGS QUICKLY LEARNT

Concerning the heart of this study - mobilisation capacities - every person, without exception, accepted to perform at least one act of savings during the test week, 80% of them took the commitment to perform at least 3. The most commonly chosen act (19 times) was the elimination of unnecessary nightlights. Not only did 93% of the people contacted achieve economical behaviours during the test week, but 88% also accepted to make the commitment to performing a more difficult act in terms of psychological or financial cost.

At the second meeting, 68 people had developed new economical behaviours. This shows that there is a real household mobilisation capacity in the Provence-Alpes-Côte d'Azur region.

Furthermore, quite often the person interviewed had been able to convince at least one other member of the family to adopt energy saving behaviour.

After the second meeting, 64 people accepted to perform a more "costly" act. The most commonly chosen act (22 times) concerned the purchase of a low-consumption light bulb. One month later, 31 people declared that they had done so, the others claiming that they were planning to do so.

The analysis of the attitude scales shows that, *at the end of the experiment, people are more favourable to energy savings than they were at the beginning* (the means of the 3 attitudes is 4,34 at the beginning and 5,05 at the end ; $F(1.67) = 43.01$; $p < .0001$), they also find that the proposed acts are less difficult and less bothersome to apply than they had initially thought.

Lastly, we should point out that the status variables (age, housing unit, socio-economic level, etc.) were not manipulated per se. The fact that they were controlled nonetheless makes it possible to envisage their possible impact on certain data which are, *a priori*, significant: attitude before, attitude after, specific attitude, number of economical acts chosen.

The effect of these status variables is quite limited: strangely, in this study, age does not have any effect on attitudes nor on the number of acts chosen. The socio-economic level gives rise to effects which are hard to interpret. The type of housing unit is the most powerful variable. It affects the attitudes expressed at the start of the study (attitude before): $F(2.70) = 6.14$, $p < .004$. People living in individual houses have initial attitudes which are less favourable ($M=3.56$) toward energy savings than people living in residential flats, no matter if they are of low standing ($M=4.63$) or medium standing ($M=4.47$)⁸. It also affects the number of economical acts chosen: $F(2.70) = 4.30$, $p < .02$. People living in individual houses choose the highest number of acts ($M=3.50$), people living in low-standing residential flats choose the fewest ($M=2.77$), people living in residential flats of at least medium standing ($M=3.29$) do not differ from the first. An apparent contradiction can thus be observed between the expression of attitudes and the behavioural commitment. This apparent contradiction (the people who have the least favourable attitudes are not those who commit to the highest number of acts) is not surprising for a social psychologist (but could be of interest to an energy expert), it is traditional in scientific literature. It once again justifies the reservations against the dominant postulate which says that since acts logically flow from attitudes, all you need to do to modify behaviour is to change attitudes.

7. QUESTIONS FOR THE FUTURE

So the study allowed to test the mobilisation capability, to begin a reflection at the regional level with regional energy actors and to know how people identify the energy issues.

Our conclusion can begin with an observation which could be used as a basis for future actions.

The observation comes from the results which have just been presented. The recommended procedure, based on commitment psychology, made it possible to observe solid mobilisation capacities concerning questions of energy savings in a family framework. It remains to be seen whether the principles behind commitment theory can be implemented in campaigns designed for wider populations. Our future research will focus on this question.

Several lines need to be studied. The first one uses the same mode.

1. *What about individual actions which are very costly both financially and in the need for expertise?*

The strategy mobilised in the last study discussed may appear "costly" in terms of the type of savings expected (for example: installation of low-consumption light bulbs, a restrictor in the bathroom, etc.). It is now a question of showing that the same forms of action can lead to irreversible behaviours which are sure to have a considerable effect on the energy bill. We are thinking, for example, of insulation in certain rooms, double glazing, etc.

The following two will have to take into account the considerable costs for the community to send an inquirer to every home. Two lines of reflection have to be opened.

2. *Action on groups*

Here, it would be a question of verifying that the procedure used in the framework of this invitation to tender, which is on a different scale, can be mobilised within the framework of action among groups of people.

For example, the study could concern a housing estate or even a neighbourhood, the researchers being instructed to talk to groups of housewives or households only. The change in scale comes from the fact that the time spent by the researcher with one person in the present study is spent with a group of some ten people.

3. *Action on populations*

Here, it is a question of seeing how the principles of commitment psychology can be implemented in a campaign aimed at a wider population. Campaigns able to draw the commitment of the members of a population have, in fact, already been carried out (Telethon⁹, white flag operation, etc.), but one may wonder whether the designers of these campaigns had really made the most of the actions they had envisaged¹⁰. Here, we propose to obtain preparatory commitment acts in a given population within the framework of a campaign requiring the involvement of the media (for example: FR3 Provence, Radio France Provence). The desired behaviours could be solicited some time later through telephone contacts.

8. THE NEXT STEPS

The last study exposed was followed by a steering group made up of ARENE, ADEME, the Provence-Alpes-Côte d'Azur Region, EDF, GDF and two consumer associations (UFC and CLCV) and the two social psychologists. This group was recently joined by a team of social economists and a subsidiary of the Union Nationale des Organismes HLM (Union of National Public Housing Organisations), these last two working on the subject of controlling energy demand in public housing.

The presentation of the results to the institutions was the first step to disseminate the concepts of commitment theory, which are not known.

Afterwards, collectively, the following decisions were taken.

For further progress, an experimental action could be launched in two cities.

This will include communication for the general public using a slogan including the following elements:

- Regional ambition,
- Link between financial savings and planetary interest,
- Encouraging an act (go pick up documentation or phone, write, visit an Internet site).

In one of the cities, this communication campaign will be carried out along with more local communication for schools and certain housing estates or neighbourhoods.

This action must be precisely designed by the summer of 2001 and implemented in the winter (at best). This could be a topic for an ECEEE 2003 contribution.

9. BIBLIOGRAPHY

- Beauvois J.L., Joule R.V. (1981), *Soumission et idéologies. Psychosociologie de la rationalisation*, PUF.
- Freedman J.L., Fraser S.C. (1966), Compliance without pressure: The foot-in-the-door technique, *Journal of Personality and Social Psychology*, 4, 195-202.
- Joule R.V. (1987), Tobacco deprivation: The foot-in-the-door technique versus the low-ball technique, *European Journal of Social Psychology*, 17, 361-365.
- Kiesler C.A. (1971), *The psychology of commitment. Experiments linking behavior to belief*, New York, Academic Press.
- Uranowitz S. (1975), Helping and self-attributions: A field experiment, *Journal of Personality and Social Psychology*, 31, 852-854.
- Beauvois J.L., Joule R.V., *Capacité de mobilisation des ménages en matière d'économies d'énergie, Rapport Final, 2000.*
- Joule R.V., Beauvois J.L. (1998), *La soumission librement consentie, comment amener les gens à faire librement ce qu'ils doivent faire ?*, PUF.
- Joule R.V. (1988), *Economie d'énergie en milieu hospitalier: action sur les comportements quotidiens - Perspectives psychosociologiques.*

10. END NOTES

- ¹ There were part of the call for tenders because they published some results about a research made 10 years ago in a hospital. This research showed that the theoretical model of commitment theory had an effect when only information had not.
- ² For example: turning off standby power.
- ³ For example: buying a CFL bulb.
- ⁴ See in appendix 1
- ⁵ Switching off the unneeded bulbs, switching off standbys, stopping the heating system when airing rooms, not wasting water when washing hands...
- ⁶ Stopping using halogen bulbs, buying CFL bulbs, decreasing the temperature of hot water, installing thermostats...
- ⁷ Self report is always used in research. The question was what you do, not what you think and generally the results are correct.
- ⁸ The contrast is significant at .001
- ⁹ Campaign to fund medical research.
- ¹⁰ For example, in the white flag operation, the chance of a significant reward only reduced the drivers' commitment. (This operation was launched by the Committee for Road Safety. People who thought they were good drivers could put a white flag on their car).

APPENDIX 1

Procedure

Making an appointment by going from door to door in pre-selected buildings.

D. Day - First meeting

- General attitude scales
- Room temperature measurement
- Inquiry about practices
 - △ Word association about "energy savings"
 - △ Evocation of latest appliance purchase
 - △ 35-behaviour analysis (see below)
- Mobilisation capacity evaluation: request for 1 (2 or 3) insignificant act(s) (insisting on their freedom to do it (them) or not) (*see below*)
- A brochure is proposed

D + 2 - Telephone

To know if people were actually able to do the acts

D + 8 - Second meeting

- Attitude scales (specific to insignificant acts)
- Mobilisation capacity evaluation
 - △ Have the insignificant acts been done?
 - △ Have other acts been done? by who?
 - △ Do you accept more "costly" behaviour?
- General attitude scales¹¹

D + 35 - Telephone

Has the more "costly" act been done?

35-Behaviour Analysis

(never - from time to time - often - always)

LIGHT

- Switching off when leaving the room
- Switching off the unnecessary bulbs

WASHING-MACHINE

- Using the washing-machine when full
- Washing at low temperature
- Using the economical programme

DISHWASHER

- Using it when full
- Not rinsing the dishes first
- Not putting the big dishes in it
- Choosing the economical programme

REFRIGERATOR

- Not putting hot plates in it
- Defrosting regularly
- Covering the cooked dishes in the refrigerator
- Washing the back grid

MICRO-WAVE

- Not using it to defreeze
- Avoid it with high water-content food
- Using it for little portions
- Using it only for the necessary portions

OTHERS

- Not filling up the electric kettle if not necessary
- Switching off the electric coffee machine as soon as the coffee is made
- Turning off standbys
- Switching off your appliances
- Not leaving the charger of cell phones plugged in
- Putting a cover on the saucepans

HEATING

- Not overheating
- Reducing the temperature in the sleeping rooms
- Not heating the unused rooms during the day
- Not heating the unused rooms during the night
- Shutting the shutters during the night
- Not airing rooms more than 5 minutes
- Stopping the heating system when airing rooms
- Decreasing the heat when you leave your home more than one day

HOT WATER

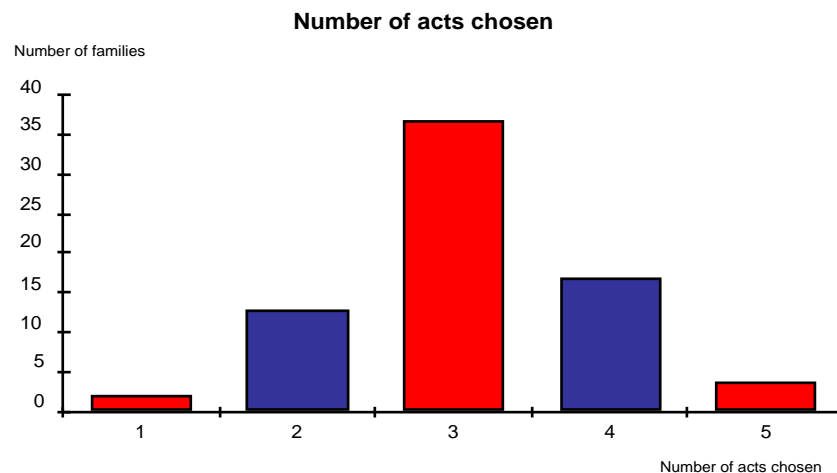
- Not leaving the water on constantly when taking a shower
- Not taking a bath
- Not letting the water run when brushing your teeth
- Not letting the water run when washing your hands

INSIGNIFICANT ACTS

(frequency of the choices)

- 0 times : using the dishwasher when full
- 0 times : washing at low temperature when it is possible
- 0 times : not taking a bath
- 0 times : using the economical programme of the washing-machine
- 2 times : choosing an economical programme of the dishwasher

- 2 times : using the micro-wave only for the necessary portions
 2 times : not heating the unused rooms during the night
 2 times : not putting the big dishes in the dishwasher
 2 times : reducing the temperature in the sleeping rooms
 3 times : decreasing the heat when you leave your home more than one day
 4 times : using the washing-machine when full
 4 times : shutting the shutters during the night
 4 times : not heating the unused rooms during the day
 4 times : not filling up the electric kettle if not necessary
 4 times : not overheating
 5 times : using the micro-wave for little portions
 5 times : not rinsing the dishes before putting them in the dishwasher
 5 times : washing the back grid of the refrigerator
 5 times : not putting hot plates in the refrigerator
 6 times : stopping the heating system when airing rooms
 6 times : switching off your appliances (TVs - computers)
 6 times : switching off the electric coffee machine as soon as the coffee is made
 7 times : avoid the micro-wave with high water-content food
 8 times : covering the cooked dishes in the refrigerator
 8 times : defrosting regularly the refrigerator
 8 times : not using the micro-wave to defreeze
 10 times : putting a cover on the saucepans
 10 times : not airing rooms more than 5 minutes
 11 times : switching off the unnecessary bulbs
 12 times : not leaving the charger of cell phones plugged in
 13 times : switching off when leaving the room
 14 times : not letting the water run when washing your hands
 16 times : not leaving the water on constantly when taking a shower
 18 times : not letting the water run when brushing your teeth
 19 times : turning off unnecessary standbys (TV)



MORE "COSTLY" ACTS

- Using fewer halogen bulbs
- Using CFL bulbs
- Reducing hot water temperature
- Reducing exterior lighting
- Installing thermostats on radiators

- Plugging the dishwasher on hot water
- Installing the refrigerator in a cooler room
- Installing a mixer tap
- Installing a flow reducer on shower head
- Not using the micro-wave to defrost
- Installing a water-saving flush in the toilet

