

5 Aim 3: Influencing and changing behaviour, tailoring⁷

People who visit the Internet site www.drinktest.nl are asked to fill in an online questionnaire with questions about demographics, their health, drinking behaviour and attitudes. After completing this questionnaire, they immediately receive online feedback with a personal advice about their use of alcohol, 'tailored' to their individual situation. This is an example of computer-tailored health communication (Kreuter, Farrell, Olevitch, & Brennan, 2000). In health communication, messages are used to provide people with the information they need to make informed decisions on their health and *persuade* people to adopt healthy lifestyles, participate in disease prevention and screening activities or to adhere to therapy advice. Computer tailoring is increasingly used in health communication. With the use of computers, individual assessment data can be rapidly processed and interpreted to generate customised feedback from a database of messages on a large scale (Kreuter et al., 2000). This makes it possible to reach many people in an individualised way.

Tailoring is not unique to health communication but may also be applied in other communicative situations such as advertising or marketing. In these settings often the terms customisation or personalisation are used, instead of tailoring. This chapter starts with an explanation of what is meant by tailored communication. Next, the theoretical background of tailoring will be discussed. Subsequently, it will be described how computer-tailored interventions are developed and what tailoring strategies can be used; moreover, some examples of interventions will be described and the effects of tailoring discussed.

5.1 Defining tailoring of communication

Tailoring has been defined as 'any combination of information or change strategies intended to reach one specific person, based on characteristics that are unique to that person, related to the outcome of interest, and have been derived from an individual assessment' (Kreuter et al., 2000; Kreuter & Skinner, 2000). According to this definition, tailored health communication differs in two important ways from other forms of health communication: its messages are individually focused rather than intended for a group of people, and these messages are based on an assessment of the unique characteristics of specific persons. Not only demographic characteristics of people are assessed but also characteristics that are related to the health problem of interest, such as the individual's health status, knowledge, needs, beliefs and behaviour.

Communication strategies can be classified according to the extent that messages are: 1) assessment-based, and 2) individualised, as is shown in figure 5.1 (Kreuter et al., 2000).

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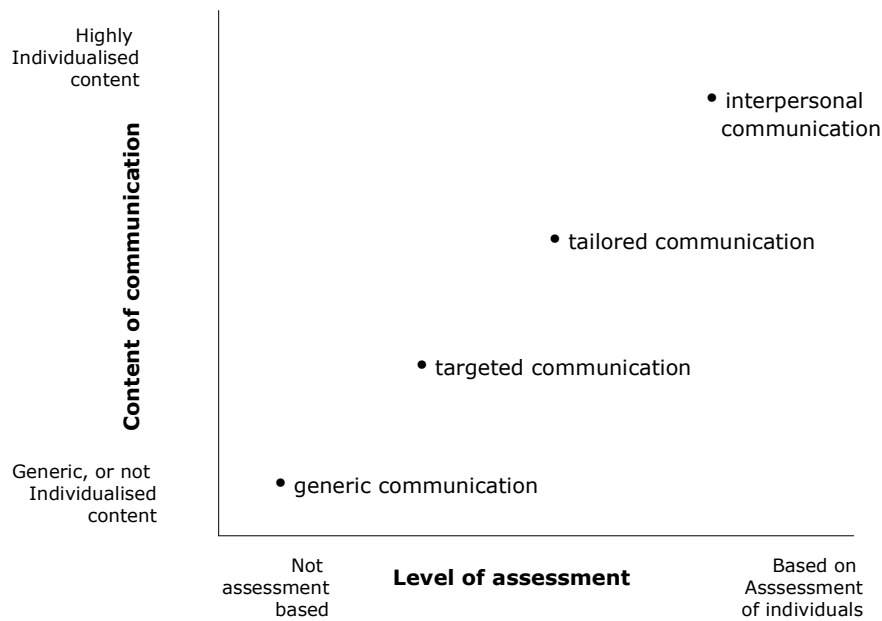


Figure 5.1: Classification of communication strategies by level of assessment and nature of content. (Source: Kreuter et al., 2000)

In mass media campaigns aimed at large populations, often generic health messages are used that do not take into consideration characteristics of specific groups or individual persons. In generic materials, a comprehensive set of information about the health problem of interest is provided. It is not assumed that all people need the same information but that individuals can select the information that applies to them and skip the information that is not relevant. Targeting or tailoring the information can make the presented information more relevant to people and thus lessen the burden of sorting out irrelevant information. Targeted health communication messages are aimed at specific segments or subgroups of a population, usually defined by characteristics shared by the subgroup's members. This approach is based on segmentation principles (see chapter 4). The rationale behind the targeting approach is that subgroups of the population have different health risks and/or differ in their health behaviours (Institute of Medicine, 2002; Kreuter et al., 2000). However, the targeting approach mainly considers demographic and other factors on a group level but does not address individual differences in e.g. health behaviours or attitudes. There is some evidence that targeted health communication is more effective in changing behaviour than generic communication is (Institute of Medicine, 2002; Kreuter et al., 2000).

Tailored communication is in many ways similar to the interpersonal communication approach of counselling. Both approaches have an assessment-feedback structure, but contrary to interpersonal communication, the interactivity of tailored programmes is limited because of the predetermined assessment questions and feedback messages. The advantage of computer-tailored communication above interpersonal communication is the possibility to reach large populations.

In this report we use the term personalisation as a synonym for tailoring. Kreuter et al., (2000) make a clear distinction between tailoring and personalisation. Personalisation, by adding a person's name to a message, can be done to draw attention to a message that is not tailored in other ways to individual characteristics. This approach is often used in direct-mail marketing to promote consumer products.

5.2 Theoretical perspectives on tailoring

In this paragraph we will discuss from different theoretical perspectives why tailored communication may be more effective in changing behaviour than non-tailored communication. First, an information-processing perspective based on the Elaboration Likelihood Model will be described. Next, two behaviour change models, the Theory of Planned Behaviour and the Transtheoretical or Stages of Change Model are discussed.

5.2.1 An information processing perspective

The elaboration likelihood model (ELM), a theory of information processing, provides a theoretical rationale for the effectiveness of tailored communication (Kreuter, Bull, Clark, & Oswald, 1999; Kreuter et al., 2000; Perloff, 2003; Petty & Cacioppo, 1981). The ELM states that persuasive messages can be centrally or peripherally processed. The central processing route requires a person to think critically about a message and the relevance of the presented arguments. Processing of information through the peripheral route requires less cognitive effort of the individual. When people process messages through the peripheral route, they use simple cues in deciding whether or not to accept the message. Peripheral cues can be e.g. the lay-out and appearance of a brochure or Internet site or the physical appeal or verbal style of the communicator. When people process messages peripherally, they rely on simple decision-making rules or heuristics. For instance, an individual may be persuaded by an 'expert' because of the heuristic 'experts are to be believed'. Peripheral or heuristic processing is expected to lead to less stable and enduring changes in attitudes and behaviour than processing of information by the central route. One must take into account that variables that are peripheral cues in many situations can sometimes serve as a persuasive argument (Perloff, 2003). For instance, the attractive appearance of a politician can function as a peripheral cue to vote for him or her in an election, whereas the good looks of a model in an advertisement can be a very persuasive argument to buy a beauty product.

According to the ELM, people are more likely to process information thoughtfully through the central route if it is perceived as personally relevant.

The rationale for tailoring derived from the ELM can be described as follows (Kreuter et al., 1999; Kreuter et al., 2000): a) redundant information is left out; b) the remaining information is more relevant to the receiver; c) more attention is given to relevant information; d) this will lead to more thoughtful consideration of factors that might hinder or facilitate behaviour change; and e) if relevant information tailored to the specific needs of an individual is thoughtfully processed, it will be more useful in helping to enact behavioural changes than non-tailored information will.

Kreuter et al. (2000) summarised results of several studies consistent with these expectations. Compared with non-tailored materials, tailored materials have been found to be read and remembered, be discussed with others, be perceived as interesting, personally relevant, and having been written especially for them. In a study that compared tailored and non-tailored weight-loss materials, it was shown that participants who received tailored materials had more positive thoughts about the materials, positive personal connections to the materials, positive self-assessment thoughts, and positive thoughts indicating intentions to change behaviour than recipients of non-tailored materials (Kreuter et al., 1999). The results of this study suggest, in line with the ELM, that tailored materials led to greater elaboration, and greater elaboration was related to subsequent behaviour change.

5.2.2 The Theory of Planned Behaviour

Before we can develop tailored messages to persuade people to change behaviour, we need to know what the relevant factors are that determine behaviour change.

The Theory of Planned Behaviour (TPB) of Icek Ajzen (1988, 1991) helps us to understand what determinants determine human behaviour. The theory states that the behavioural determinants can be influenced, therefore behaviour can be 'planned'. TPB is the successor of the Theory of Reasoned Action (TRA) of Fishbein & Ajzen (1975, 1980). The succession resulted from the finding that behaviour appeared not to be completely voluntary and under control, as the Theory of Reasoned Action states. This discovery resulted in the addition of the factor 'perceived behavioural control' and the renaming of the theory in the 'Theory of Planned Behaviour'.

The TPB (figure 5.2) assumes that behaviour is mainly determined by someone's intention to perform that behaviour. This intention is in turn determined by his or her attitudes towards the behaviour, subjective norms and perceived behavioural control (Ajzen, 1991). Attitudes are based on beliefs people have about the consequences of behaviour and the evaluation of the desirability of these consequences. Subjective norms are based on what people believe that relevant others think what they should do and their motivation to comply with those relevant others. Perceived behavioural control refers to people's perceptions of their ability to perform a given behaviour. Other factors such as demographics and personality characteristics are regarded as more distal determinants of behaviour and intentions. These factors influence intentions and behaviour through the more proximal determinants: attitudes, subjective norms and behavioural control.

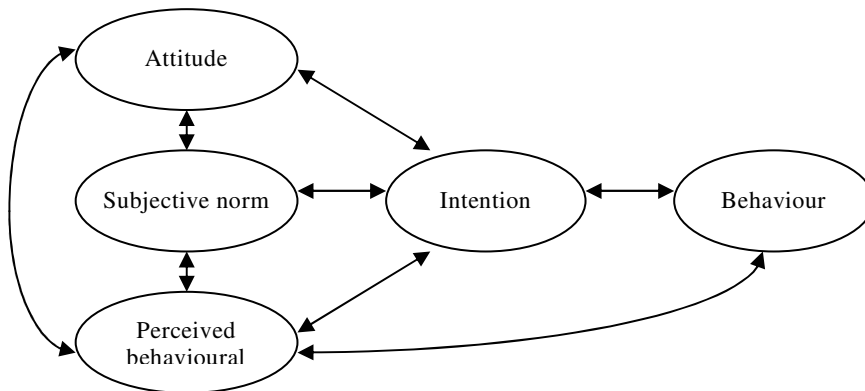


Figure 5.2: The Theory of Planned Behaviour (Ajzen, 1991)

According to the TPB, messages aimed at persuading people to change certain behaviours should be aimed at influencing the relevant attitudes, subjective norms and control beliefs. Targeting interventions to certain demographic subgroups are expected to be less effective than tailored interventions that take into account individual differences in attitudes, norms, control beliefs and intentions, because demographic factors are supposed to be more distal determinants of behaviour (Brug, Oenema, & Campbell, 2003).

5.2.3 The Transtheoretical Model

The Transtheoretical Model or Stages of Change Model assumes that health behaviour change is a phased process (Prochaska & DiClemente, 1983). It was originally developed

to explain the process of smoking cessation, but has also found to be useful for other types of behaviour (Skinner & Kreuter, 1997). This model not only considers whether a person has or has not performed a health behaviour, but also the degree to which they have considered performing the behaviour and whether they have continued performing the behaviour. The Transtheoretical Model suggests that in changing behaviour people move through a series of stages as depicted in figure 5.3.

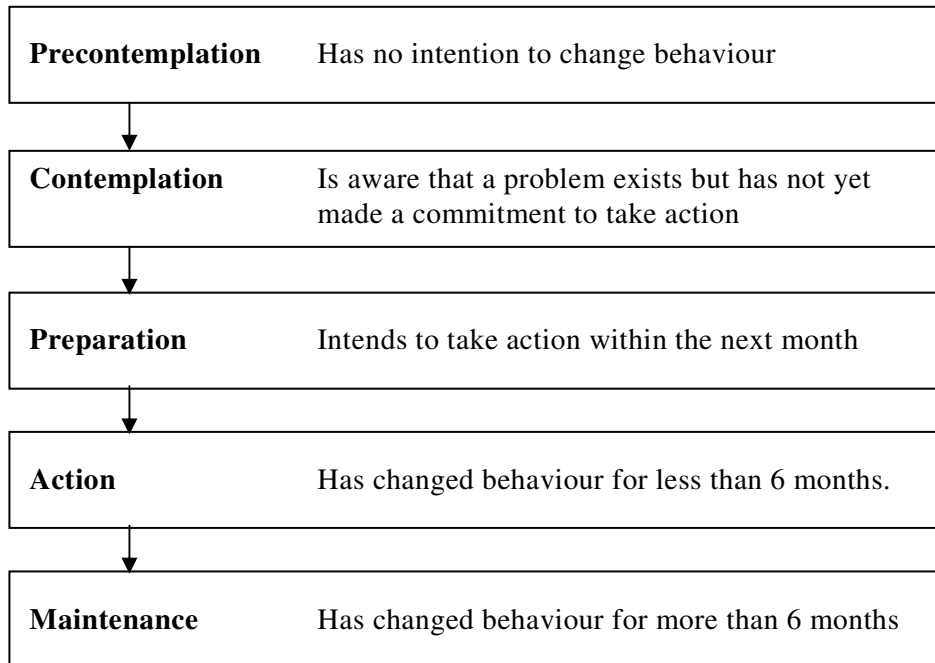


Figure 5.3: The Transtheoretical model

The model suggests that people in different stages behave in different ways, with different factors influencing their behaviour. For instance, people in precontemplation and contemplation stages have to be convinced that changes in their behaviour will be beneficial to them, hence they are most in need of attitudinal information. People in the preparation stage already have positive attitudes and may move to the action stage by information aimed to influence their control beliefs, whereas people in the action and maintenance stages probably gain most from normative information. So, different kinds of persuasive messages will be necessary for people in different stages of change to move them closer to changing their behaviour. This means interventions will probably be more effective if they are tailored to the stage of change and attitudes, norms and control beliefs of the intended recipients (Brug et al., 2003; Kreuter et al., 2000; Skinner & Kreuter, 1997).

5.3 The development of computer-tailored interventions

The process of developing tailored interventions can be divided into three phases: 1) preparation; 2) tailoring; and 3) integration (Figure 5.4; Dijkstra & de Vries, 1999).

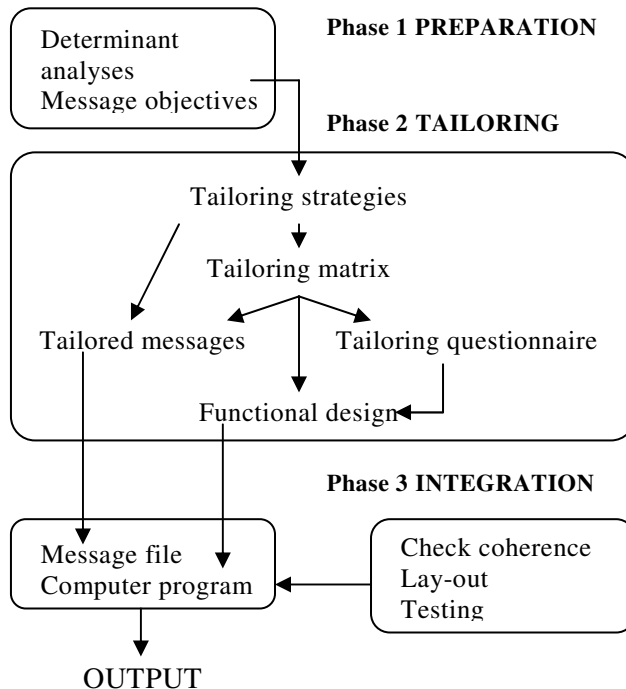


Figure 5.4: Three phases in the development of computer-tailored interventions (Source: Dijkstra & De Vries, 1999).

5.3.1 Preparation phase

In the preparation phase, interventions have to be formulated based on the study and analysis of the determinants of the behaviour in question. Theoretical models such as the TPB and the Transtheoretical Model can serve as a useful framework for the general description of relevant behavioural determinants. To determine the actual relevant determinants of the behaviour in question empirical data are needed.

5.3.2 Tailoring phase

In phase 2, the tailoring phase, it has to be decided to what extent people with different characteristics need different messages. A tailoring matrix has to be designed that specifies the individual characteristics to which the messages have to be adapted. Based on this matrix, the tailoring questionnaire is developed which assesses the individual characteristics that are used to tailor the messages. A database with messages is developed from which the computer program can compose the individually tailored interventions. To enable the computer program to compose the interventions, decision rules are written for the choice of messages based on the individual characteristics of the recipients. In the messages that are designed, two types of tailoring strategies can be used: adaptation of messages and feedback.

Adaptation of messages

Four message adaptation strategies can be distinguished (Table 5.1).

Adaptation strategies

1. Adaptation to knowledge of an individual
2. Information relevant to a specific individual
3. More information
4. Adaptation to stage of behaviour change

Feedback strategies

1. Feedback on cognitive and behavioural states
 2. Normative feedback
 3. Positive feedback
 4. Feedback on personal characteristics
 5. Empathic feedback
 6. Ipsative feedback
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Table 5.1: Tailoring strategies: adaptation and feedback

These adaptation strategies can be used in relation to the individual characteristics that are used in the tailoring matrix. A message can be adapted to the knowledge an individual already possesses of the topic of interest. Leaving out redundant information can make the information offered more relevant and may increase attention to the message. For example, information about the risks of taking certain medication when pregnant is only relevant to women and not to men. By omitting redundant information, there is more room for extensive relevant information.

A fourth strategy is to adapt messages to the stage of behaviour change of an individual. For example, trying to persuade an individual, who does not believe smoking is very bad for his health, to stop may lead to counter argumentation (“My grandfather is 95 and he has smoked all his life”). Defensiveness should be avoided by adapting the message to the low motivation of this individual, e.g. by providing information about the health effects of smoking and try to move the smoker from the precontemplation phase to the contemplation phase. However, a smoker who is in the contemplation phase does not have to be convinced that it is good to stop smoking, but should be persuaded to take action, e.g. by planning a quitting date.

Feedback

Dijkstra and de Vries (1999) distinguish six types of feedback strategies that can be used in tailored communication (Table 5.1). The first five strategies have in common that feedback is given on a characteristic state of an individual. Feedback on cognitive and behavioural states concerns information provided to an individual about the scores on the tailoring questionnaire (“You state that you believe drinking is...”; or “You state that you smoke...”). In normative feedback, an individual’s state is compared with that of comparable others. Positive feedback is a reinforcing reaction to a desired state (“You haven’t smoked for a month. Fantastic!”). Reinforcement should be provided about desired states, but detrimental states might be better ignored. To personalise the message and enhance curiosity in and involvement with the message, information on personal characteristics (e.g. name, drinking history) can be provided. Caution must be taken that personal characteristics that are fed back to personalise the message do not interfere with the persuasive power of the message. The fifth type of feedback is the use of empathic reaction to an individual’s state; for example, showing understanding for someone’s worries about health problems.

A sixth strategy is ipsative or progress feedback. This strategy can only be used when multiple assessments and multiple tailored messages are used. In these cases, feedback can be given on cognitive and behavioural changes between assessments.

5.3.3 Integration phase

In the integration phase, the separate tailored messages must be combined into a logically consistent text for each individual. To test whether the computer system designs coherent texts, simulated data from non-existing individuals can be used.

In this phase, the lay-out has to be developed depending on the way the tailored information will be presented. In tailored health communication often printed materials are used, such as newsletters or booklets. However, not only print media can be used but also audio- or videotapes, telephone, Internet sites, e-mail or computer kiosks.

5.4 Applications of tailoring

Tailoring has most often been used in health communication to create individualised printed educational materials aimed at persuading people to adopt healthy lifestyles and participate in screening activities (Kreuter et al., 2000). Tailoring is also increasingly used in patient care (Bental, Cawsey, & Jones, 1999). More and more tailored applications are being developed that use web-based interfaces instead of printed materials (Bental et al., 1999; Oenema, Brug, & Lechner, 2001). In this section, first tailored printed communication will be discussed. Next, we will discuss web-based tailoring of health communication which is the most relevant to this report. Finally, we will discuss the application of web-based tailoring outside the field of health communication and health care.

5.4.1 Tailoring of printed materials in health communication

Tailoring of printed educational materials has been shown to be more effective than non-tailored materials in helping people to stop smoking, in promoting healthy dietary habits, to increase levels of physical activity, and to improve health screening behaviours such as breast cancer screening and taking cholesterol tests (Kreuter et al., 2000). Most studies have only compared tailored with generic materials. The effect of messages might depend on the level of tailoring that has been applied. Prochaska et al. (1993) studied self-help programmes for smoking cessation and showed that printed materials that were tailored to stages of change, individual beliefs about the pros and cons of smoking, normative beliefs and self-efficacy, were more effective in helping people to stop smoking than messages that were only adapted to the stage of change (precontemplation, contemplation, action, maintenance, or relapse), a 'targeted' approach. Brug et al. (1999) showed that nutrition education letters that were tailored to respondents' consumption of fat, fruit and vegetables and their dieting attitudes, perceived social support and dieting self-efficacy, were not more effective than letters that were only tailored to the consumption of fat, fruit and vegetables.

In patient care, tailoring of printed educational materials has not been applied very often (Bental et al., 1999). Materials are mainly tailored to information from medical records and not to assessments of individual behaviours and beliefs (Bental et al., 1999).

5.4.2 Web-based tailoring of health communication

Most computer-tailored interventions to date have used printed materials. However, with printed materials only part of the potentials of computer tailoring can be used, because interactivity and immediate feedback are not possible (Brug et al., 2003). Web-based computer tailoring offers interactivity and can provide immediate feedback on answers to online assessments. It can also offer additional supportive resources, such as online discussion fora, opportunities to ask questions by e-mail, or weblinks to other sources of information and support. Up to now, little is known about the effectiveness of web-based tailored interventions in persuading people to change their health behaviours, compared with generic health messages or tailored printed health messages.

Oenema, Brug and Lechner (2001) investigated the potential of a web-based tailored nutritional intervention in comparison to a written generic nutrition information newsletter in an experimental situation. Tailoring was based on an assessment of food consumption and awareness, attitudes, self-efficacy and stages of changes regarding dietary habits. Immediately after the intervention, participants in the web-based tailored intervention group appreciated the intervention better and had higher intentions to change to healthier diets than participants in the control group who received generic information. However, effects on dieting behaviour and longer term effects were not studied.

McDonald et al. (2004) evaluated a computer kiosk-based tailored intervention to promote household safety behaviours for parents of young children who visited a hospital-based primary care practice. Tailoring was based on an assessment of knowledge, beliefs and behaviours related to injury prevention. The study showed that follow-up intervention group parents had more knowledge about child injury prevention and performed more preventive behaviour than parents in the control group who received no information.

Brunsting and van de Putte (2004) showed a significant change of stage of drinking behaviour among visitors of www.drinktest.nl who received a drinking advice tailored to their stages of change, attitudes, normative beliefs and self-efficacy related to alcohol use. However, this was a non-experimental case study without a control or comparison group.

Bental et al. (1999) reviewed tailored patient information systems. Most of the web-based or kiosk-based systems that have been developed mainly tailor on information from medical records. Evaluations have shown that patients are very positive about these systems but the effects on health behaviours of patients and on patient care have not yet been evaluated.

An example of a new web-based tailored patient information system is the website of the Dutch Arthritis Association (www.reumafonds.nl). Patients who want information about their illness fill in a short online questionnaire that asks about their age, gender, work situation, the disease they have, and the stage of this disease. They then receive tailored online information about their disease.

In the aforementioned examples the tailoring is still limited. Combining information from medical records with assessments of patients' knowledge and beliefs about their illness and treatment, adherence to treatments and self-management behaviours to inform and support patients has great potential to improve patient care. Patients could be provided with personal websites where they can find information tailored to their specific

situation and where ipsative feedback can be continuously given on changes in their medical situation.

5.4.3 Application of web-based tailoring in other fields

The application of tailoring on stages of change, personal beliefs and behaviours has shown to be a promising strategy in health communication to persuade people to change their behaviour. It has been shown that many people are willing to answer questions on their health behaviour and attitudes.

Possibly, tailoring can also be a valuable strategy in other situations, e.g. marketing. Many organisations and companies already gather information about individual consumer behaviour in order to make customised offers. The information gathered is mainly 'hard' data available from transaction records (e.g. when purchases are paid with a credit card or a loyalty card) (Norberg & Dholakia, 2004).

Information about personal preferences and attitudes needed for individual tailoring can only be collected by asking people to provide it. Although people are often willing to fill in assessments about their health attitudes and behaviours, it is likely that they are cautious to disclose information about their personal preferences and opinions of commercial organisations (Norberg & Dholakia, 2004). When organisations request personal information from consumers, these may provide incomplete or inaccurate information, e.g. because they fear misuse of information. Incomplete or inaccurate information might lead to tailored offers that do not match the expectations and preferences of the consumer.

5.5 Conclusions

Tailoring printed messages on the specific characteristics of individuals has been shown to be a promising strategy to persuade people to change health behaviours, compared with generic non-tailored printed messages. It is thought that tailored messages are more effective because redundant information is left out and remaining information is more relevant to the receiver. Tailoring also seems a promising strategy for web-based health communication but effectiveness has not yet been established. Web-based tailoring has a high potential to be effective because almost immediate feedback can be provided and additional resources or weblinks to other resources can be made available. Although many web-based tailored applications are being developed in patient health care, little is known about their effects.

It is not clear if tailoring can be easily generalised to other situations such as marketing. It is hard to collect reliable information about personal opinions necessary for tailoring. Incomplete or inaccurate information might lead to tailored offers that do not match the expectations and preferences of the consumer.

Most studies that have evaluated tailored health messages have compared these with generic messages. We do not know from these studies to what level messages should be tailored. Is tailored communication always more effective than communication targeted at segments of the population? How can we make use of the advanced interactive functions of web-based technologies to enhance the effects of tailored interventions? Is tailoring always more effective, or does the effectiveness depend on the kind of behaviour or the population? One of the most important questions is what variables we should tailor on. In most tailored interventions, behaviour change is seen as a rational

process and messages are tailored on individual beliefs about the behaviour in question, e.g. based on the theory of planned behaviour and/or the stages of change model. Messages can be tailored on the stage of change, actual behaviour, knowledge, attitudes, normative beliefs and/or control beliefs. From most studies, it is not clear to what extent these variables have been used to tailor the messages. Perhaps the persuasiveness of messages can be improved if personal emotions are also taken into account. For instance, in health care when patients have to make decisions on their treatment, when they feel frightened or anxious about the course of their illness or the side-effects of the treatment might well be important aspects for tailoring information.