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Theories as an independent chapter
Intervention Mapping: Designing Theory and Data Based Health Education Programs

CHAPTER 2: USING THEORIES, EXISTING EMPIRICAL EVIDENCE AND NEW DATA

INTRODUCTION

Objectives for Chapter 2. The reader will be able to: 1) Pose planning questions in ways that facilitate finding answers from theory, the literature and new research 2) Describe the difference between problem-driven applied behavioral science and theory-driven applied behavioral science. 3) Use the process of problem definition, provisional explanations, theory, and new data to address questions related to determinants of behavior, methods for intervention, and implementation of programs 4) Use the issue, construct and general theories approaches to accessing theory for the solution of health education problems.

The health educator reader will need to learn the use of tools, such as available empirical literature, appropriate theories, and additional research data to answer planning questions. These questions include defining behavior, finding determinants of behavior, differentiating the target population, selecting methods, creating strategies, and developing implementation plans. There is a wealth of information available in the existing literature on any health education topic. Advanced methods for gaining information from libraries give access to systematic experience of other researchers and practitioners, and what we can not find directly in the research literature, we may find in theory.

At times we will have to supplement the use of theory and the research

literature with data from new research. We may need new research to define the problem, to check the plausibility of provisional answers, and to specify the actual meaning of theoretical concepts in the practical situation. We also need data to understand our particular target population and its subgroups.

In this chapter we focus on finding and using appropriate theories in the planning of health education programs. We touch briefly upon searching and reviewing the research literature and on collecting additional data because we promote the use of the three processes together. These professional competencies have been described extensively elsewhere and we encourage the reader to consult other sources for qualitative and quantitative research and evaluation:[Green & Lewis, 1986][Windsor][Rossi PH FreemanHE, 1989 Evaluation: A Systematic Approach. Newbury Park: Sage], qualitative research [Patton, 1990][Yin, 1986][Yin, 1994[Strauss & Corbit, 1991][Huberman & Miles,1994] [Miles, 1979][Miles & Huberman,1984][Stake, 1995] [Merrrian, 1988][Morgan, 1988][Greenbaum, 1988[Kreuger, 1988][Wolcott] and literature review and meta-analysis [Hedges LV Olkin, 1985] [Cooper & Hedges, 1994.][Mullen & Ramirez,1987] [De Vries et al., 1994].

???WHAT ABOUT LIBRARY SEARCH???

PROBLEM-DRIVEN APPLIED BEHAVIORAL SCIENCE

A behavioral scientist who wants to find a solution for a problem has a different task than one who wants to test a theory in practice. More forcefully stated: a scientist testing a theory in practice will contribute to theory development but should not assume to contribute directly to any problem solving. Problem-driven applied behavioral science is different from theory-driven applied

driven applied behavioral science assumes that, given empirical support, almost all theories are useful within the conditions that limit the application of the theory (McGuire, 1985; 1991).

A MODEL FOR APPLYING THEORY

Compared to the huge amount of literature about theories in social sciences, useful literature about the systematic problem-driven application of theories is minimal. The English literature offers the book of Lave & March (1975), which describes the application of sociological models in particular, and the Dutch literature offers P. Veen (1985) 'Applying social psychology'. Problem-driven applied behavioral science refers to scientific activities that focus on changing a problem by using a transtheoretical behavioral science approach. Although theories are used, the main focus is on problem solving and the criteria for success are formulated in terms of the problem. Possible contributions to theory development is a useful but unnecessary side effect. In the next section, we will particularly focus on Veen's approach by applying it in the field of health education and promotion.

The systematic approach 'from problem to solution' comprises four steps:

1) Problem definition or clarification
2) Formulation of provisional explanations
3) Application of theoretical explanations plus additional research to formulate final explanations
4) Formulation of provisional solutions
5) Application of theoretical explanations plus additional research to formulate final solutions

behavioral science. In Intervention Mapping we are always working from a problem-driven perspective. Choices have to be made in the process of developing an intervention and theories are one tool to enable us to make better choices.

"All theories are right"

The application of theories can be very useful from a practical point of view. However, a one-sided focus on one, or only a few theories may lead to suggestions that may not contribute to a reduction or solution of a practical problem, or moreover, that may be counterproductive. A thorough analysis of the practical problem is a first and essential step in problem-driven applied behavioral science. Researchers as well as practitioners should not restrict themselves to one theory but they should look at all the different aspects of the problem. Before potential theoretical frameworks are selected, we have to answer questions such as: what is the problem, why is it a problem, who's problem is it, what are possible causes. A careful analysis of the practical problem may prevent us from spending time on irrelevant theories, irrelevant problems, or problems that are not in the area of behavioral science (psychology, sociology) and that need approaches from other disciplines (economy, law, engineering).

A second important aspect of problem-driven applied behavioral science is the selection of appropriate theories. To find out whether a theory is relevant for a given practical problem, we have to specify the conditions 1) that allow the theory to make predictions, and 2) that are necessary for theoretical concepts to be relevant (see Ajzen, 1988, p.138-142; McGuire, 1991). More than in theory- driven fundamental and applied behavioral science, problem-

6) Implem. .ation and evaluation.

Figure 2.1 represents the process of applying theory for problem solving

Insert Figure 2.1: The process of applying theories

From Problem to Problem Definition

In general health promotion planning models, we use the concept 'problem' for health-related problems such as 'There is excess mortality and morbidity from car accidents involving children. What can be done about this problem?' However, In Intervention Mapping, the concept of problem comprises more than health problems and refers to specific health education problems involving definition of behavior related to health problems, determinants of risk and health promoting behavior, the nature of effective interventions to change behavior, and plans for implementation of programs.

Insert Figure 2.2: Problem definition at different levels of IM

The most practical way to define a problem is to indicate the problem, followed by the question to the explanation and finally, the question to the solution. For example, *Problem*: 'A lot of serious accidents happen with children in cars even though this can be avoided by using child restraint devices (CRDs). *Question to the explanation*: Why is it that parents do not use CRDs? and *Question to the solution*: How can we ensure that they will?'. In this case the question to the problem is formulated in terms of determinants of behavior and the question to the solution in terms of intervention methods. Here is another example.

In the Cystic Fibrosis Family Education Program (Chapter 12) we wanted to include both medical and coping self-management behaviors in our needs

assessment and intervention[Bartholomew et al. 1988; Bar..omew et al, 1990; Bartholomew et al. 1991]. Therefore, we had to know exactly what we meant by coping with chronic illness or coping with cystic fibrosis. We posed the following questions. *Problem*: Cystic fibrosis is a serious disease that places many burdens on parents and their children. The disease must require tremendous resources for coping and adjustment. *Questions to the explanation*: " How do parents and children cope with these burdens of chronic illness"? and "How are some coping strategies more successful than others?". *Questions to the solution*: "How can we teach children and parents adequate coping skills?" These questions are answerable with theory, existing evidence and new data.

Over time the focus may shift further in the intervention mapping process, when we understand more of the problem, the explanations and the solutions. In that case the attention shifts to more specific questions about solutions (or interventions): "What methods can help us teach parents flexible coping skills?"

The questions may also be different for subpopulations: "Why can some children learn management skills while others cannot?" or "How can we ensure that each child learns as many management skills as possible". Stage of development is an obvious answer to this question and, consequently, the target group was differentiated into early childhood, school age, and adolescence.

Finally, the problem will shift to the implementation process, *Problem*: "Some health professionals do not have the motivation or the skills to help parents learn coping skills". *Question to the explanation*: "What influences

* What is the problem?
* Why is it a problem?
* To whom is it a problem?
* What are the aspects of the problem?
* What may be the causes of the problem?
* Is the problem likely to be resolved?
* Is it desirable to solve the problem?

Although the above questions are concerned with, among other things, explanations and solutions, they are not meant to offer adequate answers at this stage, but simply to clarify the problem. For example, if a solution of a problem appears to be quite obvious, it may give cause for examining why this solution had never been chosen in the past. It is possible that inside the organization responsible for solving the problem, resistance has occurred against the most obvious solution. This puts things in another light, and calls for redefining the problem to include questions to the solution.

The first step in the process of clarifying the problem is to go to the literature to find what others know about the problem. We look at our specific problem such as coping with cystic fibrosis, and we look at similar problems such as coping with other chronic diseases of childhood. We also might look for literature on processes similar to coping, processes such as adjustment. This first step of going to the literature will remain a first step through all the stages of bringing theory and research to bear on a problem.

An Example - Problem to Problem Definition - CRD Use
The Dutch Foundation for Traffic and Safety has a long history of educating parents of young children to promote the consistent use of child restraint devises (CRD) in cars to protect young children

health profes nals to help parents learn coping skills?" *Questions to the solution*: "How can we motivate and train health professionals to help parents learn coping skills?" Again, both questions can be answered by using theories, emprical evidence, and additional data.

In practice, a common mistake in defining a problem is that the problem is accepted the way it has been offered by the person or organization presenting it. An example: In 1980, one of the authors was involved in a campaign about road safety in a small Dutch town. The reason for this campaign was that it had been noticed that, in this town, relatively more accidents took place at intersections with main roads than in similar towns. The organizations responsible allowed the problem to remain defined in health terms, i.e. there is an excess of mortality and morbidity resulting from traffic accidents. The developers of the campaign regarded public education as the appropriate solution and started a large local campaign about right-of-way rules. They failed to asked additional questions about the accident problem, ie. questions of behavior and determinants. In the middle of the campaign, the health educators discovered that the majority of all right-of-way accidents happened only at one point: the exit of the car park near the supermarket. The problem could have been solved simply by pruning some bushes or introducing a traffic light. This example illustrates how important it is to make a careful and thorough analysis of the given problem.

To facilitate the problem analysis, Veen suggests a number of questions to clarify the problem. Although these questions overlap considerably, they provide good insight into all aspects of the problem.

against the potentially harmful consequences of an accident. However, there were still a high number of car-accidents in which children were the victim (problem). The Foundation decided to find out why their educational programs did not work (question to the explanation) and how they could be improved (question to the explanation). Thinking about that problem and realizing that no needs assessment on determinants had ever been done, our own definition shifted somewhat from program failure to determinants analysis; What are the reasons parents do not always use CRD's (including program failure; question to the explanation) and how can we promote the use of CRD's (not necessarily through a campaign; question to the solution).

Formulating Provisional Explanations

The step of formulating possible explanations of a problem is a creative process which primarily involves free association and brainstorming in response to concepts in the problem definition [Veen, 1985]. It is important to start with as many explanations as possible in response to a question. At the end, poor explanations may be dropped, but it is definitely not good to get stuck on one single explanation too soon.

Often brainstorming with several people from different disciplines concerned with the problem or on a program development team will lead to new points of view. In brainstorming we state the question and then generate as many answers as possible without editing or criticising our work. Recently, a work group in one of our health education methods classes generated a list of provisional explanations for the determinants question "Why do adolescents fail to use condoms during sexual intercourse?" (See Table 2.1). The list contains predisposing, enabling and reinforcing factors, and so-called contextual factors. Contextual factors are more distal determinants that seem to be important but are relatively difficult to change. The students looked for determinants, for

example, by taking the views of different people involved with it, by generalizing to similar problems, and by narrowing the question to certain populations and situations. Reversing perspectives may generate new ideas, an extreme example of which is: How can the problem be increased, how would we try to reduce the use of condoms?

Insert Table 2.1: Provisional Explanations for Lack of Condom Use among Adolescents

Before brainstorming we will have gone to the literature if we have not done so when defining the problem. In formulating these provisional explanations, behavioral scientists always use specific theoretical knowledge, whether consciously or not. It is unavoidable to do so in this stage, but it should not hinder an open approach.

CRD Example - Formulating a Provisional List
What could be the reasons that parents do not use CRDs?

1. **They may, of course, not have been exposed to information and never have heard of CRDs. It is also possible that they do not know that CRDs are especially meant to avoid serious injury from accidents.**
2. **They may think that they can prevent serious injury in other ways such as by tightly holding the child.**
3. **They may underestimate their risks Perhaps they think they do not run any risks themselves, for example, because they do not expect themselves to get involved in an accident or because they expect to be able to hold the child in case of an accident (risk perception).**
4. **There may be other things involved, for example if parents find approved CRDs too expensive or that they take too much space (practical objections).**
5. **Obviously, it is also possible that parents have actually bought a CRD, but do not use it consistently, for example, because they have two cars. Or because various children have to be transported at the same time (difference between acquisition and use).**
6. **Educational level.**

We have just formulated a number of provisional explanations why parents would not use CRD's and for a possible failing of the campaign. At this moment, there is no reason to favor one explanation over another. However, in the following steps, we begin to take into account *two criteria for good explanations*: an explanation should describe a process and it should be plausible.

A *process explanation* provides an answer to the question *why?* A process explanation provides insight into the relations among variables and between the variables and the problem or behaviour. The explanation that 'higher educated parents use CRDs more often than less educated parents' does not reflect a process yet. A process explanation might for example be that higher educated parents are relatively more convinced of the use of CRDs or that they are relatively less concerned about the high price of these seats. Continuously asking 'Why?' helps to formulate process explanations. In this respect, a useful aid is to represent the explanation in a schematic model consisting of boxes with arrows between them (Earp & Ennet, 1991). A *plausible explanation* means that it has to be examined with common sense, and survive. If we know that in health centres, parents receive consistent health education about child restraint devices, most parents being unaware of the existence of CRDs would not be a very plausible explanation. However, it would be if a special group of parents were involved, for example imigrant parents having difficulties with the language and consequently with health care facilities.

Enhancing the Provisional List With Theoretical Explanations

The next step is to reinforce provisional explanations by theoretical foundation and to acquire additional information through research. After all, health education theories are the outcome of many years of thinking about behavior and behavioral change. What we will do here is apply this knowledge and experience to our question. This will yield new explanations, cause us to delete some explanations from the provisional list, and raise new questions to be answered by means of additional research.

Veen (1985) has suggested three approaches to searching for theories to match with provisional explanations, the subject-related, construct-related, and general theories approaches. Although a clear distinction between these three approaches does not exist, they may yield different explanations to a provisional list.

With the *subject-related approach* we search for theories (as well as empirical data) through the subject or issue. For example the students working on condom use question would search for theories in literature specifically related to condom use. We would approach the literature through the subject of condom use and we would find studies using the Health Belief Model [Lux & Petosa, 1994 (HEQ 21-4)]) or Ajzen's Theory of Planned Behavior [Basen-Enquist et al, X; Schaalma et al, 1993]. If that action is clearly inadequate, we could also look for theories in literature on contraception, as a related behavior and/or for literature on risk-taking behavior by adolescents as a more general subject.

The *construct-related approach* works from the constructs on the provisional list. As we mentioned before, some of the items on the list are

probably simil... ...s, or remind us of certain theoretical constructs. For example, confidence on the student's provisional list for condom use (table 2.1) is similar to the Social Cognitive Theory construct self-efficacy. Knowledge of HIV and STD risks may be related to perceived susceptibility and perceived seriousness from the Health Belief Model or outcome expectancies from Social Cognitive Theory again. Working with the construct-related approach also means that we apply the theory fully, meaning that most of the time a theory will have more constructs than the one construct that leads us to it. For instance, when a construct of outcome expectancies leads us to Social Cognitive Thory, we will also apply other constructs from the theory, such as self-efficacy expectations and observational learning (modeling).

In the *general theories approach* we look at our question through the lense of a determinants theory or change theory and we think about the usefulness of the specific constructs in that theory to our question. If our question concerns determinants of behavior as in the case of condom use we may go to the Theory of Planned Behavior, for example, and consider subjective norms, attitudes, self-efficacy expectations and behavioral intentions [Ajzen, 1986]. Clearly, the construct and general theories approaches are limited by the number of theories with which a planner is familiar, and we devote a next chapter to a brief review of theories commonly used in health education.

Example - Applying Theory to the Problem of CRD Use

Subject-related approach
Leaving our provisional list for a while, we use the issue or subject approach and review the literature concerning the use of CRDs, related behaviors such as seat belts use, and concepts such as

safety, risks, risk protection etc. We look not only for em...ical data but also for theories and we find that seat belt use has been explained by , such as the Protection-Motivation Model [R. W. Rogers, 1983; cite specific articles seat belt????], Health Belief Model [Janz & Becker, 1984; site specific articles???] or risk perception theories [Weinstein, 1989; ???) and by regulation[???].

Construct-related approach
The list of provisional explanations mentioned a possible underestimation of personal risk. That construct leads us to risk perception models, such as Weinstein's (X) Precaution Adoption Theory, which explain why some people wrongfully think they do not run any risk. People tend to underestimate risks when they think they control the situation. A parent driving the car may believe he or she controls the child's risk, as does the parent who will hold the child in case of an accident. In addition, people always belief they run less risks than others (unrealistic optimism), partly because they have a stereotyped perception of parents who actually run risks and partly because they overestimate their efforts to take caution compared to what other parents undertake[Van der Pligt et al., 1993]. Informal interviews with parents supported these theoretical predictions. Explanations of the process of unrealistic optimism suggest learning objectives such as that parents should be taught that other parents also do take measures to protect their children, and that car-accidents are partly uncontrollable and unpredictable. As a result, parents are supposed to become more aware of the real risks and consequently will use the CRD more consistently (performance objectives).

Other risk perception models such as the Health Belief Model [X] and Protection Motivation Theory [X] cover more than just risk perception, and indicate under what circumstances risk perception leads to adequate action. They add the constucts of behavioral effectiveness and self-efficacy expectations. The threat of risk motivates parents to acquire and use a CRD provided that they are convinced that such a seat constitutes an effective means of protection (behavioural effectiveness) and that they believe they are able to acquire such a seat and use it consistently (self-efficacy).

Other constructs in the list of provisonal explanations have to do with the costs and inconvenience of CRD's. Consequently, we think of the cost-benefit balance as it occurs in the description of attitude [Ajzen, 1988]. This attitude theory in turn is part of a model of behavioural determinants which suggests three types of determinants: attitude (risk perception, behavioural effectiveness, costs and inconvenience included), social influence and self-efficacy. In our example of CRDs, it can be noticed that the provisional explanations consider neither social influence nor self-efficacy.

Working from Ajzen's theory, we also assume social influence effects. As far as CRDs are concerned, the partner's influence as well as the overt behaviour of befriended parents (modeling) will undoubtedly be important (social support). In addition, we assume that a number of people will be motivated (favourable attitude) but probably will not be able to adopt the behaviour (low self- efficacy). We will return to social influence and self-efficacy in the course of additional research, when trying to find out what reference persons are important and what the difficulties of performing the behaviour are.

General theories approach

At the same time, the application of Ajzen's model is an example of a third possible strategy for association with theories, namely the approach through general theories. If not through the construct-related approach, we would have thought of Ajzen's model via the approach through general theories. We may apply another general theory, McGuire's Persuasion-Communication Model [McGuire, 1985], especially for the question about a possible campaign failure. McGuire has distinguished a sequence of steps from a first exposure to a health education message to the maintenance of the advocated behaviour: in this case, always using CRDs. By means of McGuire's model, we can give several reasons why parents do not use CRDs (any more) or why the campaign failed:

* attention: they have never heard of CRDs;
* comprehension: they do not understand the purpose of the CRD;
* attitude: they are not convinced of the advantages of the CRD;
* social support: the partner does not consider it necessary;
* self-efficacy: it is too much trouble when you have two cars;
* behavioural change: they do not think of it at the moment;
* behaviour maintenance: they tried, but do not like it. (Actually, this last concept should also have come up in the construct-related approach because one of the provisional explanations was that parents stopped using CRDs.)

This list suggests that there may be various reasons why health education has not produced the desired effect so far. Some of these reasons have also been included in our provisional explanations and have also come up via the other two approaches, but some are new. In general, it seems that the determinants of CRDuse center around motivational issues and self-efficacy issues, including practical barriers.

And again, it is useful to represent the theories one wants to apply in a model consisting of boxes with arrows between them (Earp & Ennet, 1991). Some theories which seem to be clear and obvious at first sight apparently are not so easy to be represented in a scheme.

Additional research

We may state that we have found a number of theoretical approaches that fit with the provisional explanations. In some cases, these theories provide more insight into the exact processes of the explanations whereas at the same time, they give cause for further examination of a few variables and aspects we have not thought of yet. In practice, we would look for more theoretical handles, and we would want to know whether theoretical constructs that look promising were actually explanatory in our target population, doing additional research.

For the development of planned health education programs via intervention mapping, it is necessary to understand the determinants of the target behavior for the target population. Often, that understanding is lacking or incomplete and additional research has to be done. In general, a combination of qualitative and quantitative techniques is used to measure and analyze the determinants of behavior (De Vries et al., 1992; see chapter 3). Usually theory is used as the basis for framing research questions.

The first phase in measuring determinants involves a survey of the available theoretical and empirical *literature* on the target behaviour or related behaviors to find data and theories (which we have already done in the subject-related approach). In the second phase, a *qualitative* method is used to find out the target population's own ideas about determinants of their behaviour.
The third phase involves a *quantitative* method, a structured questionnaire with questions that are based on the results of the qualitative phase and that is administered to a large sample of the target population. During this process, the

fruitfully to the solution of the problem in question.

From the theoretical approach, our provisional explanations have been improved and subsequently accentuated through additional information. Sometimes the literature offers a wealth of empirical data. In this case there was almost no information available, but we have been able to do additional, quite elaborate research. In practice, this is not always possible, and we will have to carry out additional research ourselves, often with few time and means. Yet, we may achieve a lot with limited means, for example by means of a number of focus group interviews.

Finding solutions

We now have a number of factors that are explanatory to our question. Our task here is to summarize them and to tighten our provisional list into a final list. These factors can also be thought of as indications for solutions. Two criteria are used to select factors for solutions. One criterion is how important the factor is. What is the strength of the relation between the factor and the behavior in question. The second criterion that must be addressed now or later in program development is how easy it is to influence a certain factor. In that respect it is important to realize that some determinants may be changed by interventions directed at the individual, but others by interventions directed at the environment, often through changing the (decision) behavior of other actors or organizations. Adequate solutions will center around factors that are *important* and *changeable*. First we will brainstorm a list of provisional solutions. Then we will again find theories through the issue-related approach, the construct-related approach (constructs on the provisional list of solutions) and the approach through general (change) theories. That will lead to a list of final solutions that can be implemented and, preferably, evaluated.

Example - Finding Solutions for CRD Use

In the disappointing effects of the CRD-campaign in terms of the use of

theories that h[illegible] come up in the earlier described protocol for applying theories, will serve as a guideline for the literature search, the qualitative study and the quantitative questionnaire. Be aware that some factors can not be measures by just asking the target population; perceptions may be different from realities, so we need information from key persons and through observations.

Example - Applying Additional Research to the Problem of CRD Use

In our example of CRDs, we will concentrate on the possibility of acquiring additional information through literature study and research. It may be obvious that we do not know enough about the possible reasons for not using CRDs. Even if we have listed all the reasons we do not know which are the most important for our target population. This causes us to do more research on the determinants of the acquisition and use of CRDs or to appeal to existing research. In our example, we did a study carried out by Pieterse et al. (1992). At the exit of a car park, Pieterse and colleagues questioned parents and children about their reasons for acquiring and using CRDs or not. Their study was set up according to Fishbein & Ajzen's Theory of Reasoned Action, with specific attention for practical barriers. In short, the researchers discovered that the safety of the children (risk perception, attitude) is the main reason for acquiring CRDs. More that 90% of parents were possitively disposed to use CRDs.

However, the most important reason for not using the CRD is the child's response. If children become restless and have bad behavior in a seat, parents often do not know how to cope with the behavior and consequently remove the child from the seat. In theoretical terms, we speak of feedback about the negative consequences of behaviour. These negative consequences result in low perceived self-efficacy to continue the behaviour. In relation to the theories regarding risk perception, we can see the possible impact of emphasizing the risks of not using CRDs. Emphasizing risk will have a contrary effect on this group of parents due to their low perceived self-efficacy to use CRDs. In this case high self-efficacy for using CRDs would be an important requisite for effectively coping with risk information. If we start thinking about solutions, the stress should be on increasing self-efficacy rather than risk perception.This case illustrates that a behavioral scientist not looking farther than risk perception theories, cannot contribute much to practice. The case represents an interesting application of risk perception theory, but in this case, that theory does suggest the wrong learning objectives and consequently does not contribute

non- use of CRDs we now have quite a lot of information. We know that parents are already sufficiently aware of car seats so that an awareness campaign will not be very effective. We also know that even though parents tend to have some optimism bias in terms of their risk perception, they do obtain and intend to use car seats. We know that a number of factors are hard to influence, if at all. Regulation on child seats is not very likely in the Netherlands, although it has been adopted in some countries. A subsidy scheme does not seem feasible either. That is why these factors are put aside for the time being. In addition, some factors are easy to influence, but not so important, like making people aware of the existence of child seats.

The most important factor to be influenced concerns the child becoming restless if it is put in the seat. We know that this is an important reason for parents not to use the acquired seat and at the same time, we estimate that at this point, improvement may be achieved. We roughly think of two kinds of solutions, namely a change in the environment: improving the quality of seats, to make children feel more comfortable, and a behavioral change: training and guiding parents in coping with obstinate children. If we elaborate on that last solution, training parents in coping, there are a number of theories that may help us developing an adequate training program. Through the issue-related approach we could not find any study on training parents for this particular situation. What we did find were theories on learning [???] that would suggest that a child who has ever been transported without a CRD presumably does not want to be put in a seat any more. This means that parents have to prevent children ever being transported without the CRD. Through the construct-related approach we found theories on training, on coping, and on the combination of those two, with Bandura's Social Cognitive Theory as the most applicable one. Methods that may be used would be modeling with guided enactment, for instance in group meetings with parents. Through the general theories approach we found theories on relapse prevention (Marlatt & Gordon, 1985) that suggest ways to help parents continue to use CRD's over time, by preparing them to deal with difficult situations that would tempt them to return to non-use of the CRD.
The other possible solution, improvement of the quality of the CRD's, is a different type of solution, in the sense that the intervention would not be directed at the behavior of the parents or the child, but at the environment. A change in the environment has to be organized systematically, trough (the behavior of) various actors, such as parents, consumer organizations, industry, and retailers. Theories that may help us develop such an intervention are, for instance, theories on community development [XXX], coalition formation [XXX], and empowerment [XXX].

Having elaborated on our list of provisional solutions, we now can choose solutions that are *important and changeable*. We will then continue and want to implement the selected solutions, often working with program implementers

who are supposed to adopt our solution. Again we are confronted with new questions: what are the determinants for program implementers to adopt our solution (question to the explanation) and how can we promote the adoption of the program by these implementers (question to the solution). These questions can be answered using exactly the same process as described earlier for individual determinants and change. In practice, some theories are specifically applied for implementation of interventions, such as diffusion theory (E.M. Rogers, 1983), but in fact, adoption behavior by program implementers is theoretically not different from individual behavior by the target population. Determinants theories as the Theory of Planned Behavior can be applied to understand adoption behavior (Paulussen et al, 1994; 1995) and change theories as Social Cognitieve Theory can be applied to develop intervention directed at program implementers (Parcel et al, xxxx).

CHAPTER XX HEORIES IN HEALTH EDUCATION

Objectives for chapter XXX: Find theories that are applicable to a problem at hand, choosing from a variety of theories of determinants and behavior change

This chapter describes social science theories, primarily social psychological theories, that may be applied within the area of health education. Our list of theories can only be a selection of all possible theories. This example can be seen as a special case of the 'general theories approach'. We will describe four broad categories of theories: theories on determinants of behavior to help with the choice of learning objectives, theories on behavior change and environmental changes to help with the choice of methods, and theories on implementation to help with the anticipation of the implementation. For environmental changes and implementation, the theories from the first two section are also applicable; that is why we use the heading: 'additional' there. Table XX.1 presents the theories we discuss here. Some of these are formal theories that have a standing tradition, others are very specific and sometimes represent only one or more variables that are related to change. We refer readers to textbooks on social psychological theories [Sabini, xxx; ????] or on health education theories [Glanz et al, 1996]. In Chapter 6 we will return to these theories, but then from the perspective of the search for appropriate *methods*.

Table XX.1: A laundry list of theories

Theories on Determinants of Behaviour

There are a number of over-all perspectives that authors ve used to describe the determinants of behavior. Green & Kreuter (1991) distinguish predisposing, enabling, and reinforcing factors. General social psychological models, such as Theory of Planned Behavior [Ajzen, 1988] and Social Cognitive Theory [Bandura, 1986] distinguish basically three predisposing variables: attitudes, perceived social influence and self-efficacy. We recognize these three determinants also in the Trans-Theoretical Model [Prochaska & DiClemente, 1984], but then as determinants of the progression through the stages. Finally we see special health or risk related theories, such as the Health Belief Model [Janz & Becker, 1984].

Precede/Proceed

Green & Kreuter (1991) identify three categories of determinants of behavior, individual as well as collective behavior, each of which has a different type of influence on behavior: *Predisposing factors* are those antecedents to behavior that provide the rationale or motivation for the behavior: knowledge, beliefs, attitudes, perceived social influence, self-efficacy. *Enabling factors* are the antecedents to the behavior that enable a motivation to be realized: availability, accessability, regulations, skills. *Reinforcing factors* are factors subsequent to a behavior that provide the continuing reward or incentive for the behavior and contribute to its persistence or repetition: social support, peer pressure, rewards & punishments.

In the following, we will elaborate on predisposing factors in our description of social psychological models. However, there is also a relation between enabling factors and self-efficacy, and between reinforcing factors and percei-

ved social influence. That is a complex relation, because PRECEDE/PROCEED also recognizes the difference between perceived social expectations (predisposing) and actual social expectations (reinforcing), as well as the difference between perceived self-efficacy (predisposing) and actual skills (enabling). Over time, people's initial behavior may be determined by their perceptions of social expectations and self-efficacy, but their ongoing behavior may be more effected by actual social expectations and skills. However, it is, for instance, possible that people do not even try to change their behavior because of perceived lack of support, while in reality that support would have been available.

Social Psychological Models

Three major social psychological models for determinants of behavior are Theory of Planned Behavior, Social Cognitive Theory, and the Trans-Theoretical Model [Eagly & Chaiken, 1993]. Ajzen's (1988) *Theory of Planned Behavior (TPB)* is an extension of the Theory of Reasoned Action [Fishbein & Ajzen, 1975]. In both theories, the first determinant of behavior is the *intention* to perform that behavior (comparable to *motivation* as predisposing factor). TPB postulates that the intention is determined by three conceptually independent determinants: attitude, subjective norms and perceived behavioral control. Ajzen's use of these concepts is somewhat confusing. We would prefer to use other names: *perceived social expectations* for Ajzen's subjective norms, and *self-efficacy* for Ajzen's perceived behavioral control. Ajzen (1991) indicates that his perceived behavioral control is not really different from Bandura's (1986) self-efficacy.

* *Attitude*. In TPB an attitude is "a disposition to respond favorably or unfavo-

rably to an object, person, institution or event" [Ajzen, 1988, p.4]. Often, the attitude is ('directly') measured by semantic evaluation, such as "good-bad". TBP introduces the principle of *correspondence*, meaning that attitudes may predict behavior when both are assessed at identical levels of target, action, context and time. An attitude towards a behavior is "the individual's positive or negative evaluation of performing the particular behavior of interest" [Ajzen, 1988, p.117]. The attitude towards the behavior is determined by salient *(behavioral) beliefs* about that behavior. Each belief links the behavior to a certain outcome or attribute ("Going on a low fat diet reduces my blood pressure"). Beliefs are weighted by the *evaluations* of those outcomes ("A reduced blood pressure is very good for me") and the 'indirect' attitude is the summing of the multiplications of beliefs and evaluations.

* *Perceived social expectations.* Ajzen and Fishbein use the concept 'subjective norms', which are also assumed to be a function of beliefs, but of a different kind, namely the person's beliefs that specific, important, individuals or groups approve or disapprove of performing the behavior ("Most people around me think that I definitely should - definitely should not go on a low fat diet"). Asked for the different social referents ("My partner thinks..."), the beliefs are termed *normative beliefs* and are weigted by the *motivation to comply* to referent persons or groups ("How much do you care what your partner thinks you should do?"). The 'indirect' perceived social expectations are the summing of the multiplications of normative beliefs and motivations to comply.

Some authors distinguish between social expectations and social pressure, the last being a much stronger influence [Evans et al, XXX; De Vries et al., 1995].

* *Perceived sel. ;icacy.* Self-efficacy (Bandura, 1986) or perceived behavioral control (Ajzen, 1988) refers to the subjective probability that one is capable of executing a certain course of action. In TPB, this variable is measured by a number of questions in terms of 'complete vs little control' or 'easy vs difficult' ("For me to go on a low fat diet would be easy - difficult"). Actually, Ajzen sees self-efficacy not only as a determinant of the intention but also as a direct determinant of the behavior, next to the intention. The idea is that self-efficacy has a relation with actual skills and barriers and therefore -at least partly- predicts actual behavior independent from the intention. Theoretically, this presentation is rather confusing, but emperically the phenomenon is often supported.

Bandura's (1986) *Social Cognitive Theory (SCT)* covers both determinants of behavior and the process of behavior change. SCT explains human behavior "in terms of a model of triadic reciprocality in which behavior, cognitive and other personal factors, and environmental events all operate as interacting determinants of each other" (p.18). Major determinants of behavior in SCT are outcome expectations, perceived self-efficacy, and observational learning.

* *Outcome expectations and perceived self-efficacy.* An outcome expectation is a judgment of the likely consequence a certain behavior will produce ("When I use a condom consistently, I will prevent STDs"). Perceived self-efficacy is a judgment of one's capability to accomplish a certain level of performance ("I am confident that I can use a condom consistently"). Outcome expectations are comparable to behavioral beliefs in TPB. However, Bandura is very explicit about the interrelation between outcome expectations and perceived self-efficacy:

"The types of outcomes people anticipate depend largely on the.. ,udgments of how well they will be able to perform in given situations" (p.392). So, when people are not confident that they can use a condom consistently, they will also not expect to prevent STDs.

* *Observational learning.* Most human behavior is learned by observation through modeling. By observing others one forms rules of behavior, and on future occasions this coded information serves as guides for action. Modeling is governed by four constituent processes:

  * Attention for and perception of the relevant aspects of modeled activities;
  * Retention and representation of learned knowledge and rememberance;
  * Production of appropriate action; and
  * Motivation as a result of (observed) positive incentives.

Modeling is the influence of perceived behavior of (relevant) others, and should be distinguished from TPB's perceived expectations of relevant others. Cialdini et al. (1990) suggest two basic types of social influence: injunctive norms and descriptive norms; injunctive norms are perceived expectations from others, descriptive norms are perceived behavior of peers. Often, researchers would assess both types of social influence in an extension of TPB: The *attitude/social influence/self-efficacy (ASE-)model* of determinants of behavior [Kok et al, 1992?] [Schaalma et al., 1993][De Vries et al., 1995]. These three categories of behavioral determinants can be seen as social cognitive perceptions, predisposing factors, which have to be distinguished from reinforcing factors (e.g.

actual social support) and enabling factors (e.g. actual skills or barriers; [Geen & Kreuter, 1991]. Ajzen (1988) and Bandura both (1986) call attention to the potential discrepancy between perceptions of social norms and actual norms, and between perceptions of self-efficacy and actual skills or barriers. Improving people's self-efficacy for healthy behavior through health education should be combined with lowering barriers that hinder healthy behavior through health promotion.

Prochaska & DiClemente's [Prochaska & DiClemente, 1984][Prochaska, DiClemente & Norcross, 1992]Trans-Theoretical Model (TMM) integrates several psychological constructs. A central construct in TMM are the *Stages of Change*: people are thought to move from no motivation to change to internalisation of the new behavior. The early stages are defined by the intention to change the (problem) behavior while the later stages are defined by engaging in the new behavior. The first stage is the *precontemplation* stage in which people have no intention to change their (problem) behavior. In a succesfull change process people transit to the *contemplation* stage in which they are thinking about changing the (problem) behavior in the future (next six months). Than people ideally move to the *preparation* stage in which they are planning to change this behavior on the short term (one month). People who have just changed the behavior are called *actors*, while people who have already internalized the new behavior (for more than six months) are called *maintainers*. In the last one and a half decade several versions of the Stages of Change are developed with different definitions and stages. For example, earlier versions additionally distinguished relapsers.

Some researchers have encountered difficulties in applying the stages of change to behavior in case people do not recognize the risk (e.g. radio-active radon: most people do not even know what it is), or do not think that the risk involves them personally. Questions about the intention to change are often meaningless for these respondents. Weinstein (1988) suggests an extension of the precontemplation stage: Stage 1: Has heard of hazard; Stage 2: Believes in significant likelihood of risk for others; Stage 3: Aknowledges personal susceptibility.

De Vries & Backbier (1994) suggest that specific determinants are involved in the different stage transitions: they present data on pregnant women and (non-)smoking as an example. To stimulate transition from precontemplation to contemplation, people need to increase their perception of the benefits of changing the (problem) behavior and social support. In the contemplation stage an increase in perceived self-efficacy and social support with regard to engaging in the new behavior would result in transition to the action stage. To stimulate transtion from action to maintenance, mainly an increase in perceived self-efficacy would be needed.

TTM can be used to describe, explain and predict behavior. As such, it is a model of behavioral determinants as well as a model of behavior change. Later on, in the part about theories of change, we will describe the theory again in terms of stages and processes of change.

Social psychological models of behavioral determinants do not imply a unidirectional influence; attitudes, social influence and self-efficacy can be consequences as well as antecedents of behavior [Zimbardo & Leippe, 1991]

Positive experiences with behavior may change psychosocial determinants of behavior, thus creating reciprocal determinism [Bandura, 1986] . (See Figure 2.3).

Health and risk related models. Historically, there have been a number of theories that focus directly on health and risk related behavior [Weinstein, 1988]. A model that has been used in a wide range of health related contexts is the *Health Belief Model (HBM)* [Becker, 1974][Janz & Becker, 1984]. The basic components of the HBM are based upon psychological expectancy-value models hypothesizing that human behavior depends mainly upon the value placed by an individual on a particular goal, and upon his or her estimate of the likelihood that a given action will achieve that goal. With respect to health: the desire to avoid illness or to get well, and the belief that specific behavior will prevent or reduce illness. More specifically, the HBM consists of four psychological variables [Janz & Becker, 1984]:

* Perceived susceptibility, referring to one's subjective perception of the risk of contracting a particular condition or illness (perceived personal risk);
* Perceived severity, referring to feelings concerning the seriousness of contracting an illness;
* Perceived benefits, referring to beliefs regarding the effectiveness of various actions available in reducing the disease threat;
* Perceived barriers, referring to potential negative aspects of a particular health action.

In other words, an individual's decision to engage in a health action is

determined by his or her perceptions of personal susceptibility to, and the severity of, a particular condition of illness. The specific action taken is based upon a kind of cost-benefit analysis of perceived benefits and barriers. According to the HBM, this decision making process is triggered by a 'cue to action' which may be internal (i.e. symptoms of a disease) or external (e.g. health education).

Although an impressive body of research findings has linked HBM dimensions to health actions [Janz & Becker, 1984][Harrison et al., 1992], recent research has demonstrated the importance of factors which were not specifically developed or examined in the context of health behaviors. For example, many health-related behaviors are undertaken for reasons that are ostensibly non-health reasons, suggesting that people's cost-benefit analysis should also include benefits other than health beliefs. Current general social-psychological models suggest, as we have seen, that an individual's behavior, including health-related behaviors, is also determined by perceptions of social influences, and by a conviction that he or she can successfully execute the behavior required to produce specific outcomes [Ajzen, 1988][Bandura, 1986].

Specific theories on determinants of behavior

Besides the general theories on determinants of behavior, there are a number of specific theories that elaborate on one or more aspects of determinants without claiming to be complete. Some of these variables are proposed as extensions of one of the general models and often can be seen as aspects -or more distal determinants- of one of the three main determinants: attitude, social influence, and self-efficacy.

Risk perception. As we have seen already, risk perception is a variable in a number of health and risk related theories, and it can be considered one aspect of the attitude. Special theories explain the way people perceive risk. *Unrealistic optimism* [Van der Pligt, et al., 1993] is the tendency of people to think that they are invulnerable and that others are more likely to experience negative health consequences than oneself. There is considerable evidence that people are optimistic, however, the relation of this unrealistic optimism with behavior is rather weak. There are cognitive and motivational causes for optimism:

* Cognitive: Perceived control ('I can control the risk'), lack of experience (Never had an accident themselves or someone close), egocentric bias ('I have taken measures to prevent an accident'), sterotyped beliefs about people at risk ('Women get accidents').
* Motivational: Self-esteem maintenance ('I am a better driver than most others'), defensive coping as one way to adapt to threats.

Perceived personal risk is often a necessary condition for change, but it is seldom a sufficient condition for change.

Personal (moral) norms and Anticipated regret. A number of researchers have suggested that the Theory of Planned Behavior (TPB) should be extended with a variable personal norms, or personal normative beliefs, moral norms, self or role-identity [Manstead & Parker, 1995][Godin & Kok, 1996]. Personal norms are beliefs about what is right and what is wrong to do. In this meaning, personal norms are not an aspect of social expectations or subjective norms but are probably part of the attitude. Using different operationalizations, researchers

(including Ajzen, 1991) have shown that this variable can explain extra variance in behavior, next to current operationalizations of attitude, social influences and self-efficacy. Manstead & Parker suggest that the concept of personal norm could be related to *anticipated regret* [Richard et al., 1995]. When people try to image how they would feel after having performed unhealthy behavior (for instance unsafe sex), this anticipated regret stimulates future healthy behavior. The underlying assumption of anticipated regret is that people try to avoid feeling regretful. Manstead & Parker suggest that anticipated regret could be seen as reflecting the anticipated affective consequences of breaking internalized moral rules, however most authors on anticipated regret suggest that the concept is based in (negative) affect, not necessarily guild. The measurement of personal (moral) norms should comprise different operationalizations: "[the undesired (risky) behavior] would be wrong vs be right", "is appropriate vs not appropriate for a person like me" [Godin & Kok, 1996], and "would make me feel guilty vs feel good" [Manstead & Parker, 1995]. Anticipated regret should be measured by bipolar affective responses to the imagined undesired (risky) behavior in terms of "would make me satisfied vs dissatisfied" and "would make me anxious vs not anxious" [Richard et al, xxx]. For both variables the responses towards the desired healthy behavior could also be measured.

Attribution theories. An important variable in many models that try to explain determinants of behavior is self-efficacy. An interesting question is: What are the determinants of self-efficacy? Weiner (1986) suggests that self-efficacy (Weiner: 'expectancy of success' but we prefer 'self-efficacy') is determined by the perceived stability of the attributions for success and failure.

A person attributing a failure to a stable cause (e.g. ability) will have a lower self-efficacy for performing the same task again, compared to somebody who attributes a failure on the same task to an unstable cause (e.g. luck). After success this effect is reversed. Furthermore, attribution theory assumes that a lower self-effiacy leads to a less adaptive task behavior; people will invest less energy in the task at hand. Support for an attribution explanation of health behavior is found, among others, in a study by Hospers and colleagues (1990). They show that the success of participants in a weight reduction program was positively related to their self-efficacy at the start of the program. Self-efficacy was negatively related to stability of attributions for earlier failures, and both relationships were independent of the number of failures.

TTM and attribution theories both recognize that by using theories on determinants of behavior, we sometimes try to explain the behavior of *relapsers*: People that have tried to change their behavior, but failed. Basically, *relapse prevention theories* are theories for health behavior change, but again, they may also help in understanding current determinants of behavior. To understand the determinants of smoking in individuals that repeatedly failed quiting smoking, we have to know why they failed and how they attribute these failures (see Attribution theories). A key concept in Relapse Prevention Theory [Marlatt & Gordon, 1985] is the so-called high-risk situation. A *high-risk situation* is a situation in which people are tempted to return to their former (unhealthy) habits. In order to cope with high-risk situations, people need adequate coping responses. Relapsers obviously do not have sufficient coping responses, resulting in low self-efficacy and relapse. For determinants analyses,

this means that we have to find the high-risk situations that people are not able to cope with. Most relapsers are quite able to indicate these situations. Measures of self-efficacy should, among others, be operationalized as estimations of confidence to cope with various difficult (high-risk) situations.

A summary of determinants of behavior

Summarizing the theoretical ideas on determinants of behavior (and maintenance), we now present a model of determinants.

Figure XX.1

In Figure XX.1, the determinants are visually organized. The third column represents Green & Kreuter's (1991) ideas, the second column represents an extended version of Ajzen's (1991) Theory of Planned Behavior, adapted with Bandura's (1986) ideas: the ASE-model. It is important to recognize the feedback loop: determinants and behavior have a reciprocal relationship. Moreover, the model is open at the left side of every box; there are many other variables - for instance: personality characteristics, contextual factors- that influence behavior, through these determinants of behavior, but the basic idea is that the model represent the major intermediate determinants. Previous behavior is sometimes mentioned as a determinant of future behavior. That is basically the same as predicting tomorrow's weather from today's: very often the prediction is right, but it does not give any insight in the underlying process [Ajzen, 1991][De Vries et al., 1995].

The arrows from Reinforcing factors to Perceived social influence, and from Enabling factors to Perceived self-efficacy indicate a indirect influence next to the direct influence. For instance: Barriers have a direct negative influence on

Behavior, b. ıso an indirect influence through Perceived self-efficacy and Intention on Behavior. The direct relation between Perceived self-efficacy and Behavior is an empirical phenomenon in TPB research, that Ajzen (1988) explains by assuming that Perceived self-efficacy is a better reflection of the direct relation between Enabling factors and Behavior, than Intention. In the model, the vertical relations between the determinants are left out; these may, however, be strong or weak, depending on the behavior, the person and the situation. Our knowledge is as yet limited as to the conditions under which certain determinants are more influential than others (Ajzen, 1988, p. 138-142; McGuire, 1991). We do not present the model in figure 1 as a formal theory, but as a working model that identifies the major concepts that may function as determinants of behavior, and that reflects the interrelations among those concepts. We are aware of shortcomings in the working model, in terms of preciseness of concepts and relations. However, we do not think that any theory is comprehensive enough to cover all the different theoretical ideas. Other authors have tried to produce a comprehensive working model of theories; Flay [xxx], for instance, suggests a comprehensive model that is comparable to what we present here. Another interesting approach is the so-called *behavior mapping* process that ??? [???] recently developed; starting from predisposing, enabling and reinforcing factors, they draw a map that shows all the possible routes into specific theories (in their case, 'mapping' is a visualization, not a process). We suggest that a multi-theory approach is the best strategy when applying behavioral science to health education questions; a problem-driven applied behavioral science approach [Glanz, 1995][Kok et al., 1996].

Theories on behaviour change through communication

Current general models on behaviour change distinguish steps, phases or stages of change, especially McGuire's Persuasion-Communication matrix, Prochaska & DiClementi's Trans-Theoretical Model, and Rogers' Diffusion Theory. The major determinants theories, Bandura's Social Cognitive Theory, Ajzen Theory of Planned Behavior, and Green & Kreuter's Predisposing, Enabling and Reinforcing factors, can also be seen as change theories, in the sense that they indicate which determinants have to be changed, and, especially in the case of Social Cognitive Theory: how those changes may be brought about.

One general framework for theories on behaviour change is provided by McGuire's (1985) *Persuasion-Communication Model*. This model describes the various steps that people take, from the initial response to an educational message to, hopefully, a continuous change of behaviour in the desired direction. Simplified, the first steps refers to successful communication, the subsequent steps refer to changes in attitudes and behaviour, and the last step refers to the maintenance of that behaviour change. Going through these steps, McGuire argues that the educational interventions should change with each step. The choices that have to be made about the message, the target group, the channel, and the source, may be different or conflicting, depending on the particular step that is addressed.

Prochaska & DiClemente's *Trans-Theoretical Model* (TTM) distinguishes the so-called *Stages of Change* within the person: pre-contemplation, contemplation, preparing for action, action, and maintenance or relapse [Prochaska & DiClemente1984][Prochaska et al., 1994]. Their model does not refer to the

communicatio.. process, but the similarities between this model and McGuire's model are evident (see figure XX.2). An important contribution of the stages-of-change model is the specific tailoring of educational efforts to groups of people in different stages of change. Interventions based on this model normally have completely different methods or strategies for each stage. Another construct in TTM are the *Processes of Change*: the experential and behavioral processes. These processes are thought to mediate the cognitive changes in the next two constructs in the TTM: The *Decisional Balance*, referring to the pros and cons of the (problem) behavior and *Temptations to Engage* in the (problem) behavior which is related to self-efficacy.

E.M. Rogers' [1993] *Diffusion of Innovations Theory* will be described in detail later in this chapter, and in Chapter 6. The diffusion theory is often seen as a theory for implementation, but it is also applicable for individual changes. Rogers distinguishes four steps: dissemination or awareness, adoption or decison, implementation or action and continuation or institutionalisation.

One general theory, or theoretical framework, covering both determinants of behaviour and the process of behaviour change is Bandura's (1986) *Social Cognitive Theory* (SCT). In SCT the relationships between cognitive, environmental and behavioural variables are seen as interactive and bi-directional. Reinforcement of behaviour is a key environmental factor studied by social cognitive theorists. Other people in the environment can also affect behaviour because a person learns through observing others and receiving reinforcement. The SCT cognitive variables include outcome expectations and self-efficacy expectations. Modeling and incentives are SCTs major intervention methods to

influence behaviour.

As described earlier, the *Theory of Planned Behavior* distinguishes attitudes, perceived social expectations and self-efficacy. Green & Kreuter distinguish *Predisposing, Enabling and Reinforcing* factors. Combining TPB and SCT, we distinguished three types of (predisposing) dterminants: Attitudes/Outcomes, Perceived Social Influence, and Self-Efficacy Expectations (see figure XX.1).

Comparing and combining all the various general change theories, we see many constructs that are basically similar, see figure XX.2. We can see that most theories assume some kind of order in a series of changes: steps, stages, phases. We will continue from here on with six steps from figure XX.2: 1) successful communication, 2) attitude change, 3) social influence change, 4) self-efficacy change, 5) behavior change, and 6) maintenance of behavior change. Intention or decision is not one of the steps, because we assume that a change of intention follows directly a change in attitude, social influence and self-efficacy. As with the model in figure XX.1, we see this six steps framework as a working model, not as a formalized theory.

Within this general framework, a number of other theories can be applied [Zimbardo & Leippe, 1991][Glanz et al., 1990][McGuire, 1985; 1991]. Although these theories often cover only steps, or even only parts of steps, they can be helpful in developing interventions that focus on particular aspects of change. Using McGuire's framework, in turn, can be helpful in stimulating program planners to recognize neglected variables and to recognize appropriate

theories that can be applied.

Successful communication

Succesfull communication is often operationalized as exposure, attention and comprehension (McGuire, 1985). A health education message will have effect only if the target group is exposed to it and pays attention to it, which may involve processes of selective exposure and selective perception [McGuire, 1985]. These processes depend on, among other things, the situation people find themselves in. A student of a strictly religious school is relatively less likely to be exposed to information about condom use. At the same time, it is a matter of motivation: the same student is probably less interested in information about condom use. In the first case, it already helps if health education is provided at school. In the second case, this will not be enough and the student should be exposed to extra motivational messages, for example by choosing interesting materials which are compatible with the student's life style. Compatibility usually is not as easy as it may seem [E. Rogers, 1983]. In general, health educators are highly educated, enjoy a high socioeconomic status, have a thorough command of the current language, etcetera. Most target groups are totally different. In theory that should not be a problem, but even professional health educators tend to underestimate this difference. Health education has to be carefully geared to target groups in terms of speech, priorities, the credibility and attractiveness of the source and the message, the clearness of the message, compatibility with standards, values and experience etc. In addition, the health educator has to reckon with potential subgroups: differences in sex and

age, ethnic groups, differences in health education and experience etc.

Interest in a message is also concerned with personal risk perception [Weinstein, 1989][van der Pligt, 1991]. According to Weinstein, people tend to unrealistic optimism: they systematically underestimate their own personal risk compared to the risks of others. It is owing to unrealistic optimism that they often fail to take enough measures to protect themselves against a given risk. The principal causes of this optimism are probably that they underestimate what others undertake to protect themselves and that they conceive stereotypes of people running high risks.

A health education message has to be clear and may be repeated several times [McGuire, 1985]. However, not all receivers are equally interested in the message. In this respect as well as in the next step (attitude change), the Elaboration Likelihood Model of Petty & Cacioppo (1986) has been found a relevant theory. Some people have a strong 'tendency to think', i.e. they tend to think carefully about the message arguments (central route processing). Others show less tendency to think and are more responsive to peripheral cues such as the source, the form of the message and the behaviour of others (peripheral route processing). Changes effected through the central route are likely to persist longer than changes affected through the peripheral route. Health education should try to encourage central processing both by motivating receivers to think and handing skills for careful information processing [Petty & Cacioppo, 1986].

Attitude change

People may be aware of the severity of a problem such as cardio-

vascular diseases, cancer and aids, thinking that they will not be affected by such diseases themselves. We then say that they are aware of the severity of the problem but not of their own susceptibility. These two concepts are part of theories about risk perception and fear- arousing communication: Health Belief Model [Janz & Becker, 1984], Protection-Motivation Model [R. Rogers, 1983-]and Emotion Model [Levental, 1984]. These theories show that fear and threat caused by severity and susceptibility may incite people to action. However, the concrete form of this action strongly depends on the so-called outcome expectations [Bandura, 1986]: 'Would it help if I did this?' and perceived self-efficacy: 'Can I manage to do this?'. A tendency exists, especially among non health educators, to turn to increasingly though and thus fear-arousing communication in case of serious problems. It can, however, be stated on the basis of the above theories as well as available empirical data that fear can be a bad counsellor. Health education about cardio-vascular diseases, cancer and aids usually is fear-arousing enough as it is, and the health educator should rather attempt to persuade people of the use of prevention (outcome expectation) and to increase their perceived self- efficacy of prevention behaviour (see section: Increased self- efficacy). High-fear appeal in combination with low self-efficacy can lead to dysfunctional behaviour, for example, the denial of personal risk for HIV-infection or searching for scapegoats such as homosexuals or drug addicts. This has happened in countries where aids education has been fear-arousing without giving clear and feasible advice regarding prevention [Winn, 1991]. If clear and feasible advice is provided in order to remove threat, referring to the loss people will suffer if they do not follow this advice apparently can be very

motivating [Eagly & Chaiken, 1993][Tversky & Kahneman, 1986].

The so-called health beliefs (fear appeal) sometimes wrongfully lead to the fact that these health reasons are more attended to than other variables when examining the attitude towards prevention behaviour. However, outcome expectations cover more than mere health expectations, as we have already stated when discussing models such as Health Belief Model and common models about attitudes being one of the behavioural determinants [Fishbein & Ajzen, 1975]. An attitude is formed by balancing all relevant advantages and disadvantages (outcomes) of both the desirable and the undesirable behaviour. Moreover, people generally are susceptible to short-term considerations rather than long-term considerations [McGuire, 1985]. Health education always has to be based on the analysis of the determinants of behaviour. Nevertheless, we should realize that people nearly always notice important short-term advantages of the undesirable behaviour as well. To illustrate, McGuire (1991) outlines the reasons for adolescents to use drugs: resistance to status quo, sensation seeking (taking risks), impression management (maturity) and joining specific subcultures. Similar reasons may apply to unsafe sex.

Health education often implies that health educators and receivers take different positions at first instance. For example, a health educator thinks that adolescents should always wear condoms whereas the adolescent himself considers this superfluous. We then speak of discrepancy between source and message on the one hand and source and receiver on the other. Discrepancy is one of the variables in the matrix of McGuire which affects changes differently, sometimes even adversely, in various steps. [Fishbein & Ajzen, 1975, p.469]. In

people. This does not constitute a problem in educational situations involving individual contacts, though it does in more mass media health education where the message should be formed so as to fit in with the majority of the receivers, which is hard to realize in case of considerable individual differences.

Finally, emotional or affective aspects are very important to attitude development and attitude change. It is essential that people's first emotional response to health education is positive. This can be achieved by, among other things, repeated exposure and association with other stimuli which have already caused a positive emotional response [Zimbardo & Leippe, 1991].

Social influence change

Social Comparison Theory [Suls & Wills] argues that people like to be equal to other people as far as opinions are concerned and slightly better as it comes to abilities. Yet the others people must be referents, i.e. other points of similarities are required between the receiver and the others. An adolescent having much experience with relations and sex is not very likely to compare himself with an age-mate in an educational video who presents himself as an advocate of abstinence outside the marriage. People tend to divide themselves and others into categories, assimilating with groups they (would like to) belong to and contrasting with groups they do not (want to be) a member of [Turner, 1991]. The same phenomenon also explains why prejudices and discrimination still exist. Social comparison is important, particularly if objective information is scarce or lacking. In such cases, people tend to conform themselves to reference others ('conformity', [Festinger, 1954] 'social norms', [Fishbein & Ajzen, 1975], 'social pressure' [Evans et al, ???]), especially if this reference group is

terms of possible changes, we can state that the higher the discrepancy, the greater the potential change. However, in terms of acceptance, the opposite is true: the higher the discrepancy, the smaller the chance of acceptance and thus of change. This implies a curvilinear, reversed U-shaped relation between discrepancy and change: first, at intermediate levels of discrepancy, there is more change when discrepancy is high. However, when discrepancy is beyond a certain level, less change occurs when discrepancy increases. In addition, other variables play a part in it, such as ego-involvement and the credibility of the source. Ego-involvement implies the extent to which a receiver is emotionally involved with the subject of a message. For example, adolescents who are seropositive or know seropositives in their direct environment are more involved with class room discussions about the stigmatizing of seropositives than adolescents who do not know any seropositives. The more ego- involved a person is with the issue, the less likely the change through a discrepant message. The credibility of the source is a combination of expertise, integrity and attractiveness. The higher the credibility, the higher the chance of change. Especially if the source comprises an unanimous group of referents (see section: social influence), it may have a strong influence. This whole of influencing effects creates a complex situation which is hard to simplify [Fishbein & Ajzen, 1975]. Health educators can try not to be too discrepant by, apart from ego-involvement, stressing personal interest in behavioural change (response-involvement) and by being a reliable source. Here a problem occurs which we have already mentioned before (among others, when discussing tailoring), namely that a receiver variable like discrepancy may strongly differ between

unanimous. The fact that these others provide information about social reality is part of the explanation, as is the fact that they offer social reward. For example, an adolescent joining a couple of friends on a holiday for the first time who notices they all take condoms with them will be tempted to the same because it seems to be wise and it feels good to be one of them.

On the other hand, conformity often forms an obstruction to behavioural change. A student who intended to use condoms actually may be restrained from it due to the opinions and behaviour of others. Research on conditions under which the tendency towards conformity decreases [Turner, 1991] shows that the violation of unanimity is very effective: as soon as a reference group includes one ally, conformity immediately decreases. Conformity will also be reduced by social influence of an ally or reference group that happens to be absent at that moment. Health educators attempting to make people resist pressure often use strategies based on increasing resistance to pressure. Moscovici (1985) argues in his theory about minority influence that a minority may influence the behaviour of a majority by showing their own consistent behaviour, without becoming rigid and still being part of the group. All these resistance and forewarning techniques subscribe the necessity for the target group to learn the skills needed to resist that pressure because without improving self- efficacy, forewarning may be counterproductive.

Increased self-efficacy

Bandura's (1986) Social Cognitive Theory regards behavioural change as a kind of learning, namely the result of observational learning and enactive learning. By observing others, people learn skills and new behavioural patterns.

By enacting the behaviour, they learn by the impact of the behaviour. Most behaviour is learned by a combination of observing and enacting, supported by feedback and reward. Bandura (1986, p.161) argues that 'modeling with guided enactment' is the most optimal method to increase self-efficacy and modify behavior. Under the next two paragraphs we will describe other methods for self-efficacy improvement that are linked with behavior change and maintenance.

Behavioural change

The change from increased self-efficacy to behavioural change is not marked by a sharp line. Some of the principle variables in these two steps are equal. This is already imbedded in the concept 'enactive learning'. Providing positive feedback constitutes a great problem in many health education campaigns [Strecher et al., 1995]. Although in the long run, the outcomes of the advocated behaviour usually are profitable, hardly any positive effect can be experienced on short notice. However, positive feedback is an important reward which gives people an incentive to overt behaviour and maintenance (see section: behavioural maintenance). That is why health educators should strive for positive feedback.

Feedback is also an important concept in Locke's theory about goal setting [Locke & Latham, 1991][Strecher et al., 1995]. Locke has demonstrated that setting a challenging goal, i.e. difficult though feasible, leads to a better performance than setting an easy goal or no goal at all. This positive effect of defiant goals occurs if a person disposes of sufficient experience, self-efficacy and feedback, and accepts the challen- ge. Goal setting leads to better perfor-

mances because people exert themselves more, persevere in their tasks, concentrate more and if necessary, develop strategies. As far as aids prevention is concerned, the health educator may attempt to associate safe sex with important goals of students such as their careers which might be threatened by the possible consequences of safe sex. In this way, safe sex becomes part of the strategy to attain long- term objectives.

In educational campaigns aimed at behavioural change in particular, so-called commitment techniques can be used [Kiesler, 1971], i.e. clearly visual positions such as public commitment or the public demonstration of an advocated behaviour. The latter may consist of, for example, young people participating in an educational video about aids prevention. The effect of commitment can be explained partly by cognitive dissonance [Aronson, 1991], which causes people to adapt their opinions to their behaviour.

Zimbardo & Leippe (1991) have argued that actual prevention behaviour may be motivated by so-called prompts, i.e. recollections of one's intentions at the right time and the right place. Such a prompt ensures that good intentions are made salient when needed. Health educators may help their target group to find the most appropriate place for these prompts. In doing so, they may apply for the so-called anticipated regret [Richard et al., 1991], making people imagine how they would feel after performing the undesirable behaviour. Such a strategy has proved capable of keeping people from the undesirable behaviour.

Behavioural maintenance

Recently, health educators have been more involved in behavioural maintenance [den Boer et al., 1991] than in the past, using *attribution* theories

[Weiner, 1983] and *relapse prevention* theories [Marlatt & Gordon, 1985]. Behavioural maintenance is essential to health education; behavioural change makes sense only if it is continued. It happens quite often that people showing new behaviour receive negative feedback or find themselves in so-called high risk situations, thus creating the risk of relapse. People who have relapsed into their former behaviour several times and have attributed this to stable causes, will develop low self-efficacy and feel helpless. They should learn that they failed due to instable causes, and that the advocated behaviour requires abilities which they are able to acquire. Relapse prevention techniques teach people how to deal with high risk situations. In practice, techniques to increase self-efficacy and enhance behavioural change are also used in coping with negative feedback, high risk situations and the promotion of behavioural maintenance. People of the same target group may find themselves in different stages of change and therefore, it is important to continue health education in one way or the other, for example, by means of *boosters* (Flay et al., 1989). Such boosters may dilate upon problems encountered or provide materials which later will meet the need then prevailing.

Additional theories on environmental change

Interventions targeted at determinants of behavior (or even directly at determinants of the problem) may be located inside the individual such as attitudes, perceived social influence and self-efficacy, but they may also be located outside the person in the environment, the *physical* environment as well as the *social* environment. In practice most determinants are combinations of

personal and environmental determinants. Self-efficacy (personal) is related to barriers (environment); perceived social expectations (personal) are related to real social expectations (environmental). The distinction between personal and environmental for determinants is not necessarily the same as for interventions: A personal determinant may be intervened upon through personal as well as environmental interventions, for instance: in case of social pressure for unhealthy behavior, the intervention could focus on resistance to social pressure (personal), but also on changing social influence through group methods (environmental). Comparably, interventions could focus on self-efficacy improvement but also on reducing barriers. Of course, an optimal intervention would try to combine both types of interventions.

Very often, environmental changes are brought about by changes in other people's behavior or organizational behavior: gouvernmental decision makers, managers, elections, school boards, hospital boards, etcetera. Basically, these behavior changes follow the same course as individual behavior change, as we described earlier. There are a number of theories, however, that focus specifically on influencing the environment. We will describe them shortly.

Community development ???

Social action ???

Coalition formation ???

Empowerment ???

Additional theories on implementation

Implementation of a prevention program is an essential part of the health

promotion planning process. If we do not ensure implementation, our work has been largely wasted. School programs for the prevention of smoking are useless if teachers do not use them. Underestimating diffusion and adoption barriers is one of the reasons for health education being sometimes ineffective. While the need for information on determinants of individual behaviour is commonly accepted, we often fail to recognize that, to develop implementation strategies, we also need information on determinants of institutional 'behaviour', such as adoption of a prevention program by organizations or decision-makers within those organizations. As we mentioned earlier, all theories on individual determinants and individual behavior change may be appied for implementation behavior. There are some special theories that we see often applied for implementation, but they could also be useful in individual behavior. The existing knowledge in theories on the diffusion and adoption of health promotion will be summarized in Chapter 6. Here we will just mention three perspectives: features of the innovation that determine adoption, program implementers' behavior, and the importance of a linkage system.

Classical research in the area of diffusion and adoption, mostly in schools and worksites, suggest a number of features of an innovation (the health education intervention) that determine (non)adoption [Orlandi et al., 1991]. These are : *Compatibility, Flexibility, Reversibility, Relative advantage, Complexity, Cost-efficiency, Risk.* The focus of contemporary research on diffusion of health interventions gradually shifts from features of an innovation to program implementers' planning behavior and thought processes with regard to awareness, adoption, implementation, and continuation of innovations.

Within this decision making approach, the abovementioned features of innovations can be dealt with as subjective expectancies about advantages and disadvantages of innovation adoption, implementation, and continuation respectively. The theory of planned behavior can be applied to implementation behavior as well [Paulussen et al, 1994][Paulussen et al., 1995].

With regard to intervention development and the anticipation of factors that may impede or improve intervention diffusion, Orlandi and colleagues stress the need for a *linkage system* between the resource system that promotes the intervention (e.g. the Anti-Cancer Council) and the user system that is supposed to adopt the intervention (e.g. schools). Such a linkage system should include representatives of the user system, representatives of the resource system, and a change agent facilitating the collaboration. Again, the theories that were mentioned in the paragraph on interventions can be applied here to develop interventions for adoption and implementation.

Epilogue

STILL HAS TO BE WRITTEN

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Table 2.4: A laundry list of theories

Variables:	Theory/Author(s):
Theories on determinants	
Predisposing/Enabling/Reinforcing	PRECEDE/PROCEED, Green & Kreuter
Attitude/Subjective norm/ Perceived behavioral control	Planned Behavior, Ajzen
Outcomes/Modeling/Self-Efficacy	Social Cognitive theory, Bandura
Social pressure	Evans
Stages of change	Transtheoretical model, Prochaska & DiClemente
Health beliefs/Benefits/Barriers	Health Belief Model
Personal risk/Unrealistic optimism	Precaution Adoption Model, Weinstein
Personal moral norm	Godin
Anticipated regret	Richard
Attributions/Success expectancies	Attributional theories, Weiner
Coping with high-risk situations	Relapse prevention, Marlatt & Gordon
Theories on behavior change	
Successful communication/Changes in determinants & behavior/Maintenance	Persuasion-Communication, McGuire
Stages of change/Processes of change	Transtheoretical model, Prochaska & DiClemente
Modeling/Active learning/Incentives	Social Cognitive Theory, Bandura
Selective exposure/Selective attention	McGuire
Compatibility	Diffusion Theory, E.M. Rogers
Personal risk/Unrealistic optimism	Precaution Adoption Model, Weinstein
Central route/Peripheral route	Elaboration Likelihood Model, Petty & Cacioppo
Fear/Danger/Outcomes/Self-efficacy	Protection Motivation, R. Rogers
Outcomes/Advantages and disadvantages	Reasoned Action, Fishbein
	Planned behavior, Ajzen
Short term outcomes/Long term outcomes	McGuire
Discrepancy/Involvement	McGuire
Emotional response	Zimbardo
Social comparison	Social comparison, Suls
Conformity/Social pressure	Festinger
Resistance to social pressure	Evans
Goal setting/Feedback	Locke & Latham
Commitment/Cognitive dissonance	Kiesler
Prompts	Zimbardo
Anticipated regret	Richard
Attributional dimensions	Attributional theories, Weiner
High-risk situations/Coping	Relapse prevention, Marlatt & Gordon
Additional theories on environmental change	
community development	
social action	
coalition formation	
empowerment	
Additional theories on implementation	
Characteristics of the innovation	Diffusion theory, E.M. Rogers
Dissemination/Adoption/ Implementation/Continuation	Diffusion theory, E.M. Rogers
Linkage	Orlandi

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