

RESEARCH AND PRACTICE OF HEALTH PROMOTION

PREVENTION THROUGH FEAR?

The State of Fear Appeal Research

VOLUME 8



Federal Centre for Health Education

BZgA

The Federal Centre for Health Education (BZgA) was founded in 1967 as an authority in the sphere of responsibility of the Federal Ministry of Health and is based in Cologne. In the field of health promotion, it handles both information and communication tasks (education function) as well as quality assurance tasks (clearing and coordination function) at the national and international level.

The information and communication tasks include the provision of information in subject areas with particularly priority as regards health, and also in subject and target group-specific key fields. The current key field, for example, is health for children and adolescents. In addition, the BZgA implements long-term, nationwide education campaigns in the fields of AIDS education, drug prevention, sex education and family planning. The essential tasks of the BZgA in the quality assurance sector include the elaboration of basic scientific principles, the development of guidelines, and the elaboration of market overviews of media and measures in selected fields.

As part of its quality assurance tasks, the BZgA commissions numerous research projects, expert reports and studies on current topics of health education and health promotion. For the most part, the results of this work are incorporated into the series of scientific publications of the BZgA, in order to make them accessible to the interested public in the diverse fields of health promotion. The "Research and Practice of Health Promotion" specialist booklet series is intended to be a forum for the scientific debate. The primary aim is to expand and promote the dialogue between science and practice and to establish the basis for successful health promotion.

**RESEARCH AND PRACTICE OF HEALTH PROMOTION
VOLUME 8**

PREVENTION THROUGH FEAR?

The State of Fear Appeal Research

An expert report by Jürgen Barth and Jürgen Bengel
commissioned by the Federal Centre for Health Education, Cologne

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Preface

The question as to the design of health-related information is of central importance in the nationwide education campaigns of the Federal Centre for Health Education. In order to advance and safeguard the communicative concept of its media, measures and campaigns, the BZgA commissions expert reports in order to clarify fundamental questions which, however, could well also be of interest to other institutions involved in prevention work.

The present expert report provides an overview of the current status of fear arousal research in the field of health education and health promotion. The paper centres on the question as to the effects of fear appeals on health-related and preventive behaviour.

Jürgen Barth and Jürgen Bengel first outline the theoretical reference framework by presenting existing constructs for explaining preventive behaviour and theoretical models relating to the effectiveness of fear appeals. They subsequently present effects of fear appeals on the basis of examples from the fields of drug prevention, AIDS prevention, dental hygiene and eating habits. Based on their analysis, the authors formulate recommendations for the design of preventing messages and information.

With this volume, the BZgA is presenting another contribution to quality assurance in health education and health promotion. The objective is to promote the professional exchange and the establishment of a consensus concerning suitable concepts and strategies for health promotion and prevention, and to constantly improve their quality.

Cologne, April 1998

Dr. Elisabeth Pott
Director of the Federal Centre
for Health Education

Outline of the Project

Project title: Prevention through fear - the current state of fear appeal research. Contributions of health psychology and fear appeal research to the theoretical substantiation of prevention strategies and the design of education campaigns, giving particular consideration to drug prevention.

Goals:

- Review and systematisation of theories on the effects of fear appeals.
- Integration of new empirical findings and development of conclusions for mass media prevention.

Material: Research monographs, Journals, Project reports

Sources: Literature search in the PSYCLIT, PSYINDEX, MEDLINE, DISSERTATION ABSTRACTS and CURRENT CONTENTS databases (as at the end of 1995). Personal letter to selected experts in this field, asking them for the titles of their new papers.

Implementation period: October 1994–October 1997

Project implementation: Psychological Institute of the University of Freiburg
Dept. of Rehabilitation Psychology
Belfortstraße 16
79085 Freiburg, Germany
Tel.: +49(0)7 61/2 03 30 46
Fax: +49(0)7 61/2 03 30 40

Project management: Prof. Dr. Dr. Jürgen Bengel

Authors: Dr. Jürgen Barth, Dipl.-Psych.
Prof. Dr. Dr. Jürgen Bengel, Dipl.-Psych.

Sponsor: Bundeszentrale für gesundheitliche Aufklärung
(Federal Centre for Health Education – BZgA)
Ostmerheimer Str. 220
51109 Köln, Germany
Tel.: +49(0)221/89 92-342
Fax: +49(0)221/89 92-3 00

Project management: Jürgen Töppich, Dipl.-Soz.

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Foreword

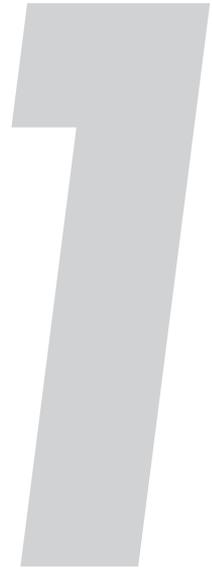
In November 1994, the Department of Rehabilitation Psychology at the Institute of Psychology of the University of Freiburg was commissioned by the Federal Centre for Health Education (BZgA) with drawing up an expert report on the current state of fear appeal research. The aim of this expert report is to provide a comprehensive review, summary and critical analysis of the current state of research concerning the perception and processing of appeals with a threatening context, health and prevention behaviour, and the psychological design of health-related information. In this way, we hope to approach an answer to the question as to the effects of fear appeals on changes in attitudes and behaviour. This problem is primarily examined in the tradition of what is referred to as fear appeal research. However, different theoretical concepts and contradictory empirical results make it difficult to formulate a guideline for planning and substantiating preventive measures.

The thematic focus of this work is drug prevention. For this reason, this study builds on the expert report by Künzel-Böhmer, Bühringer and Janik-Konecny (1993) – also commissioned by the BZgA – which provides a practice-oriented overview of the efficacy of various drug prevention measures. This paper also draws on research results from the fields of AIDS, dental hygiene, road safety, eating behaviour, etc., in order to give a comprehensive review of the fields of application of fear appeals.

This paper is an abridged version of an expert report on fear appeal research first published in 1998 (cf. Barth & Bengel, 2000), and it is divided into four sections. After this introduction, *Chapter 1* undertakes a conceptual classification of preventive measures on the basis of various dimensions. The aim of this chapter is to present terms for the classification and description of preventive measures, which are then used in the sense defined here. *Chapter 2* deals with theoretical models on the efficacy of fear appeals. The theories of persuasion advanced by Janis, McGuire, Leventhal, Rogers, Petty and Eagly are presented on the basis of the chronological development of this field of research. This presentation of the theoretical positions is then followed, in *Chapter 3*, by a compilation of empirical papers from 1980 to 1995. *Chapter 4* summarises the results of this paper and formulates recommendations for the design of preventive messages and information.

We should like to take this opportunity to thank the sponsors for their constructive cooperation. Mr. Töppich and Mr. Christiansen, who were able to give us valuable suggestions, should be mentioned specifically. We should like to thank the following people for their scientific support in the literature search: Prof. Becker (University of Trier), Prof. Hornung (University of Zurich, Switzerland), Privatdozent Jonas (external lecturer at the University of Tübingen), Mr. Neuhaus (Bundesvereinigung für Gesundheit [Federal Association for Health] in Bonn), Prof. Rogers (University of Alabama, USA) and Prof. Sutton (University of London, England).

INTRODUCTION



The aim of this chapter is to provide an introduction to the concepts of the subject and to position this study within those sub-disciplines of the social sciences which have so far looked at the topic of fear as a motivating agent in the field of prevention. To this end, definitions will be presented and conceptual terms explained (*Section 1.1*). Problems in the design and evaluation of mass media education campaigns in the field of drug prevention are then presented and points of reference to the subsequent chapters established (*Section 1.2*).

1.1 Definitions and Introduction to the Concepts

Preventive measures and prevention are commonly used terms, although there is no generally applicable definition of prevention. The various definitions proposed emphasise different aspects, depending on the respective point of view. But there are points in common, which are formulated below as criteria for defining the term prevention:

- Prevention attempts to preserve or improve the state of health of the population, or of individual groups of the population, or individual persons.
- Prevention is not merely a task for medicine, but operates in an interdisciplinary fashion, i.e. psychology, sociology and education all have contributions to make here.
- In its realisation, prevention attempts to address various levels (e.g. knowledge, attitudes).
- Preventive measures are designed on a long-term basis and aim at long-term changes in experience and behaviour.

In addition to these common partial determinants of preventive measures, there are also numerous differences in the design of preventive measures. A number of central dimensions will be presented below, allowing differentiated consideration of preventive measures.

Caplan (1964) was the first to introduce the distinction between primary, secondary and tertiary prevention, an important classification and, hence, description of preventive measures. According to Caplan, the aim of primary prevention strategies is to reduce the rate of incidence of mental and physical diseases. It is intended that this be achieved by avoiding or reducing existing risk factors (such as obesity, lack of exercise, smoking, high blood pressure; cf. also Bengel, 1988). Many studies on cardiovascular diseases, diseases of the support and locomotor apparatus, malignant tumours, diseases of the respiratory tract and tooth damage (to mention but a few fields) deal with this concern (cf. Bengel, 1988; Schwartz & Robra, 1991), the “risk factors” for each set of diseases generally being the focus of attention (cf. the section on the specificity of preventive measures, below). The target group for primary prevention measures is that of healthy individuals, i.e. people with no subjective or objective symptoms of disease (Bengel, 1993).

Secondary prevention describes the early detection, early diagnosis and early treatment of diseases, the aim in the latter case being the rapid elimination of a disease which is already present, so as to prevent it progressing and becoming chronic. In addition, medical examinations (screening examinations) are used to diagnose health problems in an individual as quickly as possible, with the aim of treating that individual at an early stage. Early screening examinations for cancer, such as have become established in recent years, may be cited as examples of secondary prevention measures. The term tertiary prevention can be defined conceptually as being largely equivalent to the concept of rehabilitation. The main task here is the prevention or elimination of sequelae to a disease and re-integration into employment.

This classification of preventive measures by Caplan is still used for categorising prevention measures. It makes it possible to define specific measures and objectives for different target groups. However, many preventive measures are difficult to categorise using this threefold subdivision. Measures aimed at weight reduction in overweight patients can be cited by way of example here. These may be regarded, on the one hand, as primary prevention measures to reduce the risk of cardiac infarction, but they can also be seen as secondary prevention measures for the treatment of obesity (i.e. a disorder that is a disease in its own right). Thus, a specific prevention measure may be both primary and secondary in terms of its preventive nature, depending on the perspective taken.

Another classification of preventive measures was devised by Nasser (1979), who made a distinction between five stages of prevention, taking into account the anticipated effects of the measure and the target group. He differentiated between healthy individuals, healthy exposed individuals, early-stage patients, advanced-stage patients, and chronically disabled individuals or those facing death. In this context, Nasser defined prevention as any avoiding of a drop to a lower stage, which, for him, meant that prevention is meaningful and possible for different target groups at every stage of a disease.

The breakdown of preventive action according to the severity of the disease or the symptoms can be regarded as the common feature of the hypotheses of Caplan and Nasser. The aim of prevention is to avoid a disease or prevent it becoming chronic. This definition of

Dimension	Differentiation of the terms within the respective dimension
Specificity	Specific prevention versus non-specific prevention
Target group level	Population prevention versus risk-group prevention
Intervention level	Person-oriented prevention versus system-oriented prevention

Table 1.1: Dimensions of prevention (based on Perrez, 1992).

preventive measures on the basis of disease is, however, not the only definition conceivable. Other dimensions will be presented below which can be used as a basis for distinguishing between preventive measures. In this context, Perrez (1992) lists three central dimensions of preventive action. He distinguishes between the specificity of preventive measures, the target group and the intervention level as the dimensions (cf. Table 1.1).

Specific prevention measures are aimed at reducing the incidence and prevalence of a certain disease. The “risk factor model”, as it is called, forms the basis for the intervention in this context. In contrast, non-specific prevention measures have no clear, disease-related indication, but such health-promotion interventions aim rather at a general, non-specific improvement of health. In the target group dimension, prevention can be subdivided into population-related measures and measures aimed at individuals with a specific risk behaviour. Measures utilising fear appeals generally use mass communication strategies and are population-related in nature as a result of the low degree of control over which individuals receive the mass communication message concerned. The third dimension for describing prevention distinguishes between person-oriented and system-oriented measures. System-oriented measures attempt to influence the social, ecological or cultural environment of individuals by means of structural changes (circumstantial prevention), so as to reduce the risk of a disease. Person-oriented measures (behavioural prevention) place the individual at the centre of interest, and measures such as health counselling or health training are important forms of intervention in this context.

1.2 Mass Communication Prevention Campaigns in the Field of Drug Prevention

Drug prevention takes place at various levels (primary and secondary prevention) and uses different measures (communication versus structural measures). This multiplicity of approaches is shown in Table 1.2 for the field of the prevention of illegal drugs.

Fear appeals, such as are used in communication measures, are the focus of this expert report. The relationship between mass communication strategies and personal communication strategies is regarded as being complementary, not competitive. Mass communication strategies alone would appear to be fairly ineffective without supplementary personal communication or structural strategies. The Federal Centre for Health Education (1993) also reached this conclusion on the basis of the work by Künzel-Böhmer, Bühringer and Janik-Konecny (1993). The primary aim of mass communication campaigns should be to focus attention. Behavioural changes cannot be expected solely as a result of the dissemination of preventive messages via the mass media. Rather, a multi-stage procedure should be selected, in which sensitisation of the target groups to a particular topic is followed by per-

		Primary prevention		Secondary prevention	
		specifically for drugs	not specifically for drugs	specifically for drugs	not specifically for drugs
Communication measures	Mass communication	Educational posters	General health information at the cinema	Film about a young person at risk from drugs	Information on television and radio; popular magazines for health problems
	Personal communication	Role plays at school (being able to refuse offers of drugs)	Strengthening self-confidence; Promoting communication skills; Finding one's identity	Therapy groups for those at risk	Strengthening self-confidence; Promoting communication skills
Structural measures	Immediate social environment	Introduction of drugs education as a curriculum principle	Improving the living/income situation of deprived families	Drugs counselling teachers	Setting up initiative groups for general self-help
	Cultural and ecological framework conditions	General ban on advertising for tobacco and alcohol; Narcotics Act	Reducing youth unemployment	Increasing the penalties for dealers in illegal drugs	General contact centers for those at risk

Table 1.2: Schematic representation of strategies and measures of applied drug prevention (from Grigoleit, Wenig & Hüllinghorst, 1994).

sonal communication preventive measures to promote concrete changes in attitudes and behaviour. Künzel-Böhmer, Bühringer and Janik-Konecny (1993) see both the general public and also children and young people as a target group for mass media drug prevention, and the advertising spots should be adapted to these target groups. Personal communication measures exist in the form of role plays about rejecting drugs in the area of risk prevention and range all the way to therapeutic groups for people at risk. With respect to the evaluation of preventive measures, personal communication offers of drug prevention are more suited to evaluation than mass communication offers, because of the short effect latency and clear effectiveness criteria. There is no doubt that educational posters relating to drugs and the effects of anti-drugs advertising spots also have short-term effects on the receivers, but these are far more heterogeneous and more difficult to record, and virtually impossible to relate to specific measures in field studies.

The possibility of reduction to a single advertising slogan was illustrated by Baker, Petty and Gleicher (1991). They worked from the hypothesis that the extent and direction of an attitude change and, in particular, a change in behaviour is dependent on the way in which a preventive message is processed (cf. McGuire's Processing Model in *Section 2.2, Fig. 2.5*).

Six receivers of a message and their changes in behaviour are presented in order to show the possible ways in which a message can be processed (cf. Table 1.3). Person A does not understand the message and so no further information processing results. Persons B, C, D and E understand the fundamental points of the message, but their subsequent thoughts are different. Person B in this example thinks: “The people represented are not typical.” In contrast, Person C thinks: “The example presented is doubtless correct, but I am not at risk from this.” Persons D and E are the only ones who have the initial response desired by the campaign, since both think: “Drugs are dangerous”. But it is precisely this assessment which provides yet another reason for Person D possibly to take drugs in the future since he/she likes danger and excitement. In Person E, the desire to avoid this risk ultimately leads to the motivation not to take drugs and to corresponding behaviour. Person F is unable to understand the message owing to poor cognitive skills, and changes his or her attitude on the basis of an irrelevant feature of the message: liking for the celebrity. However, this attitude change has no consequences in terms of behaviour (cf. also *Section 2.2.5*). The authors found the most important result of this model demonstration of different ways of processing a message to be that, apart from the one desired form of processing, there are also other ways of interpreting a message which do not result in the desired change in behaviour.

Person	A	B	C	D	E	F
KNOWLEDGE:	None	Some people who use marijuana go on to use hard drugs and are therefore in DANGER of wasting their lives			CELEBRITY says to say no to drugs	
COGNITIVE RESPONSES TO MESSAGE	Irrelevant	But few people are like this	Marijuana is dangerous to other people	Marijuana could be dangerous to me		The CELEBRITY disapproves of drug use
		Message is irrelevant to me		I like danger	I dislike danger	I like the CELEBRITY
ATTITUDE				I might like drugs	I dislike drugs	I dislike drugs
BEHAVIOUR				POSSIBLE USE OF DRUGS	NON-USE OF DRUGS	

Table 1.3: Possible responses to the 'Just say no' advertisement (Petty, Baker & Gleicher, 1991:75).

In addition, the authors list three traps relating to the success of an anti-drugs campaign (cf. also Jonas, Eagly & Stroebe, 1994):

1. Knowledge about the risks of using drugs can be regarded as irrelevant and has no effect on attitude or behaviour (Persons A, B and C).

2. Even if changes in attitude as targeted by the message are achieved, these changes may result from simple key stimuli (e.g. liking the speaker) and not from any processing of the message (Person F).
3. Even if the message is processed and an attitude change occurs, the person involved may lack the skills and self-confidence to convert the new attitudes into actions (Person D).

It is clear that the effects of mass media campaigns should be evaluated at the various levels of message processing. Behavioural characteristics as criteria of efficacy are therefore inadequate criteria for the evaluation of mass communication. What is rather required is their extension to include cognitive parameters and measures relating to attitude. At the same time, the dilemma of a broad range of effects arises, meaning that only rarely will it be possible to list changes applying to all individuals on the basis of mass communication messages. Over the past few years, health psychologists have formulated psychological constructs which can be assumed to affect health-related behaviour. Detailed and comprehensive publications are already available on this topic and should be mentioned here (cf. Schwarzer, 1997). Fear arousal operating models will be discussed in the next section (*Chapter 2*).

2

THE EFFECT OF FEAR APPEALS

This chapter is intended to provide an overview of the current state of research into the operation mode of fear appeals. A defining introduction of the terms communication, attitude, persuasion and fear appeals (*Section 2.1*) will be followed by a presentation of important models of the mode of operation of fear appeals, supported by empirical results (*Section 2.2*). Each model will be assessed, taking into account the empirical support of the hypotheses, methodological problems, and the applicability of the theory in practical situations. *Section 2.3* will involve a comparative discussion of the approaches presented and a summary of the central statements.

2.1 Introduction

In *Chapter 1*, preventive measures were divided into structural, mass communication and personal communication strategies. Mass communication strategies are the primary interest below, since the theories presented are principally concerned with mass media messages. The theory of mass communication strategies is based on the idea of a single sender with numerous receivers. The communication itself consists of various components, Laswell's formulation (1948:38) "*Who says what in which channel to whom with what effect?*" describing the most important components of communication. The formal model of communication by Shannon and Weaver (1949) can be regarded as being equivalent to this formulation (cf. Fig. 2.1).

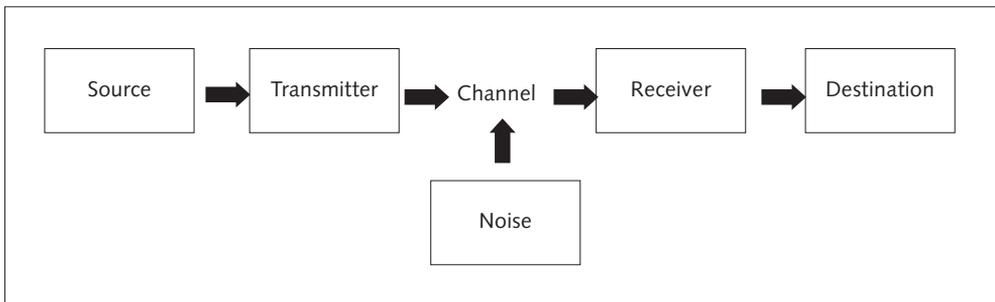


Fig. 2.1: Model of communication according to Shannon and Weaver (1949).

The most important elements of this communication model comprise the source of the information (communicator), a communication or message, a channel on which the message is communicated, and a destination (receiver, recipient). The message received may differ fundamentally from that sent, for example as a result of external factors, such as noise, or internal personal conditions, such as lack of concentration, memory problems, etc. This lack of clarity was described by Shannon and Weaver as “noise”. Laswell's formulation also makes it clear that communication generally has a goal. The intended ef-

fects of messages in the field of prevention are changes in attitude or behaviour or increased knowledge on the part of the receiver. In *Section 2.2* below, changes in attitude and behaviour are the focus of interest, since fear appeals are regarded as a motivating agent for behaviour and no direct influence on the acquisition of knowledge is ascribed to them. Changes in health-related attitudes and health behaviour itself are of chief concern here.

While terms such as behaviour and knowledge have become part of everyday language and do not require definition, the term “attitude” needs further explanation. According to Triandis (1971), attitudes have cognitive, affective and action-oriented components and are interpreted as directing actions. Rosenberg and Hovland (1960; after Stahlberg & Frey, 1990) defined attitudes by measurable effects on these three levels (behaviour, affect and cognition). This interpretation of attitudes is portrayed in Fig. 2.2: a central, mediating position is attributed to attitudes, working from the basis of independent variables (such as individuals, objects, etc.). Affective reactions are yielded as measurable effects, and these also include verbal expressions of feelings. In addition, attitudes are revealed in the form of cognition by means of verbal expressions of opinion or as assessments.

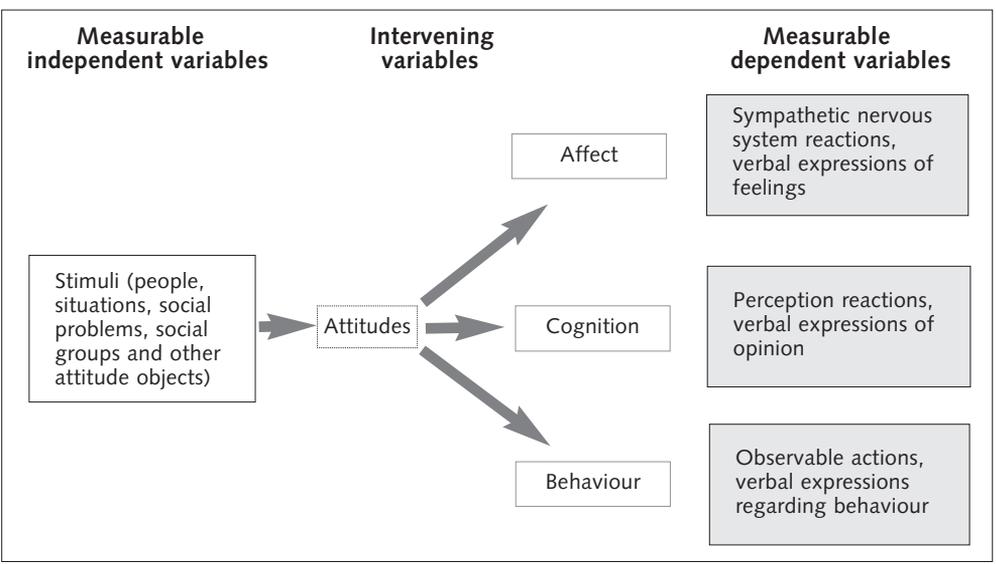


Fig. 2.2: Three-component model of attitude (according to Rosenberg & Hovland, cited from Stahlberg & Frey, 1990:145).

Thus, a change in health-related attitudes can be recorded only indirectly via behaviour, cognitions or affective reactions, the most important intended effect of preventive messages being a change in behaviour. Empirical studies either record behavioural characteristics for assessing a possible attitude change, or they record cognitive or affective reactions with respect to an attitude object. In a comparison of individual empirical studies, it is important to take the operationalisation of an attitude change into account, since non-uniform

results may also come about as a result of characteristics being recorded differently. This is why the recording methods of each study are integrated in the presentation of results in *Chapters 2 and 3*.

Changes in attitude may be triggered by various environmental conditions, such as information, individuals, etc., and are reflected in the receiver in affect, cognition or behaviour. The extent of the attitude change may depend on characteristics relating to either the receiver or the sender. In terms of receiver-related characteristics, for example, particularly favourable conditions for an attitude change exist if information is offered on a subject area in which the receiver has considerable personal interest. Sender-related aspects encouraging an attitude change might be, for example, information provided by relevant reference persons (such as parents, fellow pupils, friends, spouse). What must be borne in mind is that the extent of the attitudinal change depends on both receiver-specific characteristics and sender variables. For this reason, both sender-related characteristics (e.g. medium, source, credibility) and receiver-related characteristics (e.g. self-confidence, sociodemographic parameters, prior behaviour) will be discussed in terms of their importance for an attitude change.

Persuasion is one form of changing attitudes. This type of communication is present in mass communication prevention strategies which attempt to bring about a change in behaviour or attitude in the receiver by communicating information. In English-language publications, the term used is “persuasion” and this type of message is called a “persuasive message”. Trenholm (1989) provides the following definition of the term persuasion and describes various different target levels: *Persuasion is a form of influence that predisposes, but does not impose. It alters others' judgments, and not just their behavior. It affects their sense of what is true or false, probable or improbable; their evaluations of people, events, ideas, proposals; their private and public commitments to take this or that action; perhaps even their basic values and ideologies* (Trenholm, 1989:5).

According to this definition, persuasive messages are distinctive for the fact that they change a person's assessments (attitudes, etc.) and can also cause behavioural changes. Moreover, the voluntary nature of these changes is also an important characteristic of persuasion. This can also be seen in the distinction of the term “persuasion” from the terms “attitude change”, “conformity” and “propaganda” (cf. Jonas, 1987). The difference between attitude change and persuasion, according to Jonas, is that a change of attitude can also occur without prior communication and thus without the involvement of another person. The aim of persuasion is also not only an attitude change but, in the final analysis, also a change in concrete behaviour. In contrast to persuasion, conformity is distinguished by the fact that conforming behaviour occurs as a result of assuming convictions (possibly as a result of social pressure) without considering any arguments while, in the case of persuasion, the quality of the arguments is taken into account by the receiver. Jonas explains the difference between propaganda and persuasion on the basis of the content of a message used for changing attitude or behaviour. However, regardless of the assessment of

the content as true or false, a single message may count as propaganda for one observer, while another observer sees it as being persuasion. This illustrates the problems involved in distinguishing between propaganda and persuasive communication (cf. also Witte, 1994).

Fear appeals are one form of persuasion. Fear appeals are defined as persuasive messages informing the receiver that values of relevance to him or her (such as life, health, property, etc.) are under threat. Fear appeals consist of verbal or non-verbal material intended to trigger fear in the receiver and thus bring about changes in attitude or behaviour. The English-language literature uses also the terms, “threat appeals” or “fear-arousing communications” to describe fear arousal messages.

Numerous empirical studies have been carried out on persuasion and theoretical models of the mode of action have been developed on the basis of these. The same is true of the sub-area of fear appeal research, in which empirical work has been carried out in experimental studies on areas of varying content (such as, health, road safety and politics). One question which has been investigated frequently in these studies is the nature of the link between induced fear and the extent of attitudinal change. A rough consideration reveals different research traditions which assume a curvilinear connection between the intensity of the fear and the attitudinal change. Alongside these are models assuming a linear relationship between fear intensity and persuasion. The theoretical models of fear appeal research developed in this context will be presented below and both the advantages and disadvantages of each design will be analysed. There are different theoretical hypotheses regarding the function of fear and the effect of messages with a strong fear arousal element on the processing of persuasive communication.

The first model to be presented is the *drive-reduction model* (main proponents: Dollard and Miller) (*Section 2.2.1*), which goes back to the psychoanalytical drive model in which fear is regarded as a drive and thus as motivating for human behaviour. This is followed by a presentation of the *curvilinear model* (main proponents: Janis and McGuire) which assumes a curvilinear relationship between the intensity of the fear and the extent of attitudinal change (*Section 2.2.2*). In contrast, the *parallel response model* (main proponent: Leventhal; *Section 2.2.3*) assumes a linear connection and distinguishes between two processes running in parallel in the processing of fear appeals. On the basis of health psychology papers, we then move on to the *protection motivation theory* (main proponent: Rogers; *Section 2.2.4*), which regards the subjective experience of fear as a prerequisite for behavioural change. Finally, information processing models are presented, which have so far studied the field of fear appeals only as a peripheral issue, but which nonetheless constitute important additions to McGuire's model. The *elaboration likelihood model* and the *heuristic-systematic model* (main proponents: Petty and Cacioppo, as well as Eagly and Chaiken; *Section 2.2.5*) are also described. As well as the theoretical models, empirical studies testing the theoretical position in each case are also mentioned. The chapter concludes with an assessment of the empirical verifiability of the theoretical hypotheses and the usefulness of the theories for the planning and realisation of preventive measures.

2.2 Models to Explain the Effects of Fear Appeals

2.2.1 The Drive-Reduction Model

The drive-reduction model of human action goes back to psychoanalytical and learning theory concepts of human motivation. Freud's psychoanalytical drive concept (1915) forms the starting point of the learning theory concept of human action as devised by Hull (1943; 1951). Similarly to Freud, Hull works from the assumption that a state of need (e.g. hunger) is accompanied by a drive stimulus until it is satisfied. While the drive stimulus is active, the individual will perform reactions which lead, at least in part, to satisfaction of the need and thus also to reinforcement (an increase in the probability of occurrence). Thus, in the course of a lifetime, the reaction patterns to specific drive stimuli which have been ontogenetically programmed at birth (according to Hull's hypothesis) will alter. This learning process is based on the "law of effect" formulated by Thorndike (1898), which describes the link between stimuli and reactions by the subsequent satisfactory state of the person (or the animal). Reactions which experience a "reward" by way of a satisfactory state will occur more frequently in the future according to Thorndike's hypothesis.

By analogy with the approaches presented above, in the drive theory propounded by Dollard and Miller (1950) fear, as an unpleasant emotion, has the property of a drive or urge (cf. also Mowrer, 1939; 1956). The fear induced by the sender of a communication motivates the receiver of the communication to adopt modes of behaviour which achieve a reduction of the fear. In the opinion of the authors, the behaviour is not directed but is based on the trial-and-error principle. Every reaction which leads to a reduction of fear is reinforced, so that the probability of occurrence of this reaction in the future increases. The extent of the reinforcement is linked to the extent of the reduced fear. The behaviour demonstrated may be geared to the recommendations that follow the induction of the fear.

Hovland, Janis and Kelley (1953) name two prerequisites for the efficacy of fear appeals, i.e. for a change in attitude or behaviour in the sense of the measure recommended. The first step involves the necessity of the communication triggering fear in the receiver (the fear being able to act as a drive). The second condition is that the recommendations of the sender and their anticipated realisation will achieve direct reduction of the fear. This linking of fear induction and fear reduction immediately afterwards is viewed by the authors as a necessary precondition for the efficacy of fear appeals. In the opinion of Hovland and Janis, this provides the theoretical justification for the use of fear appeals to change attitudes and behaviour.

Hovland, Janis and Kelley (1953) believe that it is not only overt behaviour which is reinforced, but that concealed processes are also reinforced, such as behaviour-related inten-

tions that also lead to reduction of fear as a result of an “internal monologue” (e.g. “I really must give up smoking so as to stay physically fit!”). Hovland, Janis and Kelley (1953) point out that inducing fear can also trigger unintentional and undesired effects. For example, excessive fear can be expected to lead to limited attention or to aggressive impulses with respect to the sender, as well as to the avoidance of further confrontation in this area (in this context, cf. *Section 2.2.2*, below).

Empirical evidence on the Drive-Reduction Model

Empirical support for the drive-reduction model in terms of the effect of persuasion must be described as unsatisfactory. The experimental studies generally recorded the level of fear at only one time (shortly after fear induction), i.e. the predicted reduction in fear resulting from fear-reducing behaviour was not tested experimentally. This means that the extent of fear reduction was also not directly related to the demonstrated behaviour and its reinforcement. So, the central statement of the drive-reduction theory remains unconfirmed in empirical terms. There have so far been only a few attempts to examine the hypotheses of the model by an accompanying measurement of physiological parameters (intended to illustrate the subjectively experienced fear). For example, in the study by Schützenhöfer and Knoch (1991), the heart-rate was measured as a physiological parameter while the subjects were viewing slides on road safety (using pictures of accidents). The heart rate was found to be significantly faster with high levels of induced fear than with low levels. However, the decrease in physiological agitation following a fear-reducing message was not recorded, meaning that this study does not provide proof of the theory. The paper by Watson, Pettingale and Goldstein (1983) also investigated the effect on heart rate of viewing an anti-smoking film. They were able to show that female smokers reacted significantly more strongly than female non-smokers. However, neither the increase nor the decrease in physiological agitation was used in this study to predict the realisation of the recommendations. The defence processes formulated by Hovland, Janis and Kelley could also be confirmed only partially in the study by Janis and Feshbach (1953).

Assessment of the Drive-Reduction Model

The drive-reduction model offers interesting starting points and valuable theoretical considerations regarding the use of fear appeals to motivate human action. For example, even in this theory, induction of fear alone was regarded as a fairly inappropriate means for achieving a directed change in human behaviour, whereas major importance was attributed to the fear-reducing instructions. This hypothesis was empirically investigated and confirmed in later works by Leventhal (cf. *Section 2.2.3*). However, it has not been possible to prove empirically the central statement regarding a link between the extent of reduced fear and the extent of learned behaviour. Overall, the empirical verification of the model is poor.

2.2.2 The Curvilinear Model

The study published by Janis and Feshbach in 1953, examining changes in attitude and behaviour with respect to dental hygiene, was of fundamental importance for the development of the curvilinear model. This study was shaped by the drive-reduction model described above, since the authors initially assumed that fear induction was a suitable means for motivating an individual. However, the results showed something which had never before been reported in a study. The greatest amount of conformity was produced by the communication which contained the least amount of fear-arousing material (Minimal group). High or medium levels of fear induction (Strong group, Moderate group) resulted in less frequent performance of the tooth-brushing behaviour presented as desirable and useful on a long-term basis (cf. Table 2.1).

	Strong Group (N=50)	Moderate Group (N=50)	Minimal Group (N=50)	Control Group (N=50)
Increased conformity	28%	44%	50%	22%
Decreased conformity	20%	22%	14%	22%
No change	52%	34%	36%	56%
Net change in conformity	+ 8%	+ 22%	+ 36%	0%

Table 2.1: Change in tooth-brushing behaviour after one week (Janis & Feshbach, 1953:84).

In their study, Janis and Feshbach (1953:78) give the following explanations for the weaker effect of strong fear-arousing communications on the basis of these results (Summary in hypothesis form by the authors):

1. If intense feelings of fear are generated, the receiver of the message can no longer direct sufficient attention to the communication to process it correctly.
2. As a result of the fear induction by the sender, the receiver may develop aggressive impulses towards the sender. The receiver will reject the sender's arguments as a reaction to these impulses.
3. If the fear generated by the communication from the sender is not appropriately reduced by the contents of the communication or the individual's resources, that person will avoid similar situations in the future. Moreover, defence reactions will also develop, with the person losing interest in this subject or denying the risk.

Janis and Feshbach assume a decrease in attention in receivers of an intensely fear-arousing message, meaning that contents of the message are no longer perceived and processed.

On the basis of the assumed lack of attention and the defence reactions, the authors hypothesise that fear-arousing communications lose their effectiveness from a certain level upwards. They were able to prove this defence effect using the results of their study, since they found the lowest level of behavioural change in the group with the highest induced fear.

The authors were able to provide only partial evidence concerning the factors restricting the efficacy of fear appeals (aggression, drop in attention, etc.). They were able to prove the hypothesis that people in the group with higher fear induction still remained in a state of high emotional tension after the experiment. The assessment of the speaker as “less authoritarian” by individuals with low fear induction was also regarded as proof of the hypothesis and, conversely, it was concluded from this that defence reactions arise with high levels of fear induction. The hypothesis that attention is restricted as a result of the induced fear was rejected on the basis of the empirical results. The same applies to the hypothesis regarding aggression towards the sender.

Janis (1967) worked on the basis of two different consequences for information processing to explain the way in which induced fear works. He distinguished between functions of fear which promote persuasion (“facilitating effects”) and functions which inhibit persuasion (“interfering effects”). Janis attributes the persuasion-promoting function of fear to the increased “vigilance” and the increased “need for reassurance” (cf. Fig. 2.3, Curve 1). He lists various individual and interindividual factors, such as degradation of the sender, isolated experiences proving the contrary, the need to defend oneself against “manipulation”, among others, as functions of fear which inhibit persuasion (cf. Fig. 2.3, Curve 2).

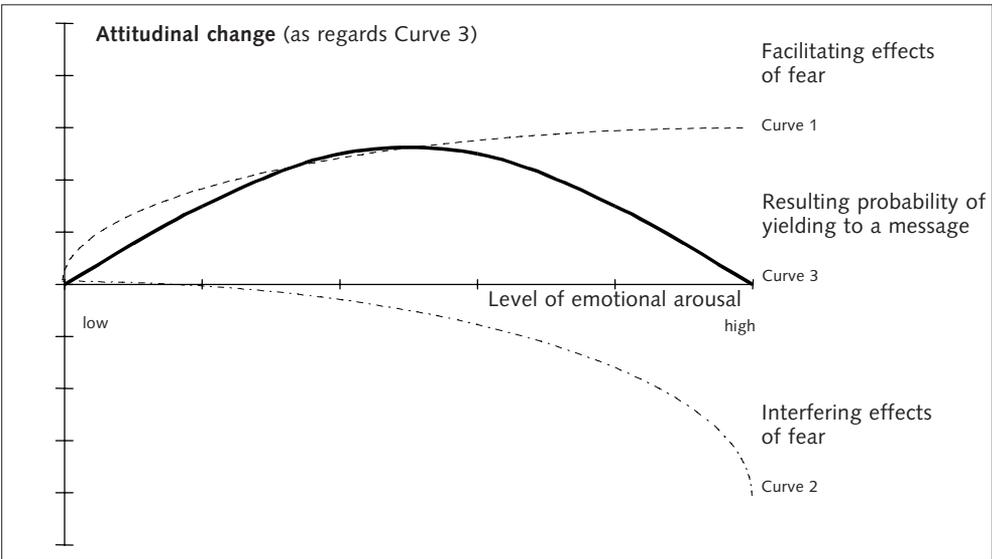


Fig. 2.3: Relation between level of emotional arousal and attitudinal change on the basis of facilitating and interfering effects according to Janis (1967).

To explain the curvilinear profile, Janis assumes that, at a low fear level, the facilitating trends increase more sharply than the interfering trends as the fear increases. However, beyond a certain point, this relationship is reversed, i.e. the interfering trends increase more sharply than the facilitating trends. The resulting probability of realisation of the recommendation thus runs in an inverted U-shaped curve against the level of fear (cf. Fig. 2.3, Curve 3).

However, Janis (1967) believes that the processing of the persuasive communication cannot be represented by a single curve for all individuals. Rather, the peaks of the optimum efficacy of fear are found at different levels. This leads to a “family” of curves which, however, permits no general regularity regarding the maximum tolerable level of fear. Janis formulates this relationship as follows: In other words, the marked decrement at the high-arousal end of the cognitive efficiency curve leads us to expect that for each person there will always be a maximum optimal level of arousal beyond which acceptance will be adversely affected by the temporary loss of cognitive efficiency (Janis, 1967:182). Janis illustrates this relationship as follows (cf. Fig. 2.4). There are individual peaks at which the probability of an attitudinal change is greatest; these peaks depend on the topic, the prior attitude of the individual and other factors.

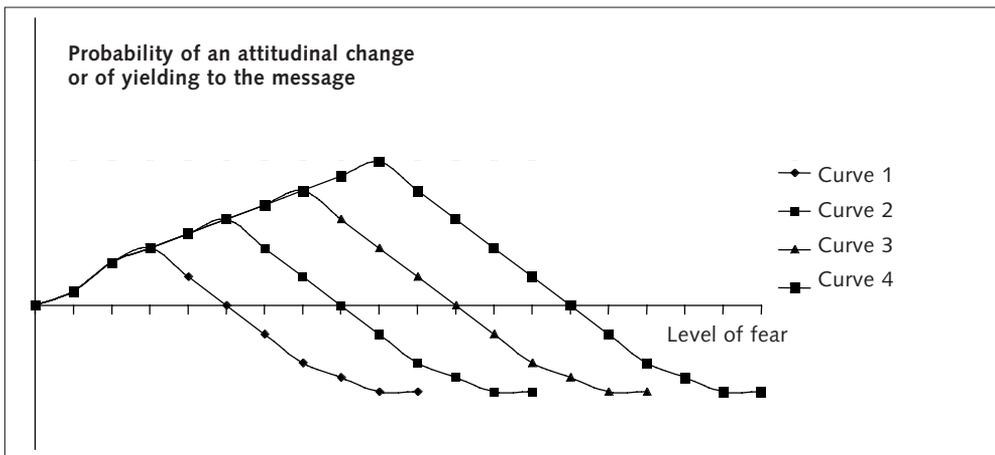


Fig. 2.4: Hypothetical family of nonmonotonic curves illustrating the relation between level of fear generated and the degree of acceptance of the proposal (from Janis, 1967:182).

In his theory, McGuire arrived at similar predictions to Janis regarding the influence of fear on persuasive effect. However, the processing model of persuasion formulated by McGuire (1968a) will first be presented. It is of fundamental importance for investigating the way in which persuasive messages work. He distinguishes between six stages which have to be passed through in processing persuasive information and which determine the efficacy of a message with respect to behaviour. In the first stage, the receiver has to be reached by the message from the sender in the first place, i.e. situational preconditions must be met which

allow the receiver to receive a message (e.g. before reading an advertisement, a receiver must have bought a magazine). The second stage is described as vigilance and assumes that a certain degree of alertness must be present in the receiver to take in and process the message. The third stage involves understanding the message. In order to understand a message, the receiver must exhibit the cognitive potential to process the message. In stage four, acceptance of the arguments occurs and thus also an attitude change. Retention of the new attitude in the fifth stage forms the basis for a behavioural change (corresponding to the altered attitude) in stage six. Two important consequences are derived from this model as regards the efficacy of persuasive messages. First, the individual must pass through each of the stages described; second, each subsequent stage is only possible when the previous stage has occurred. This illustrates the complexity and difficulty of a change in behaviour intended by a third party. If it is assumed for each of these stages that two-thirds of the persons addressed pass through them, the multiplicative linking of the individual processes yields an overall probability of 5% (0.66) of a change in behaviour (cf. Petty, Baker & Gleicher, 1991). This complex model is often reduced to two central processes of attitudinal change. The first stage is then described as “reception” and contains the attentive uptake of information. McGuire refers to the second stage as “yielding” and means by this the acceptance of the arguments of a message (cf. Fig. 2.5).

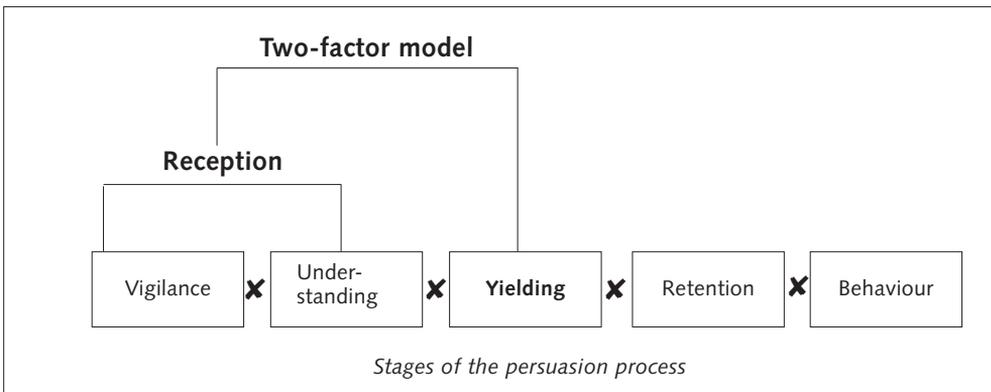


Fig. 2.5: McGuire's information-processing paradigm (from Stroebe & Jonas, 1990:180).

Simplification of the model into two processes has advantages as regards the possibility of measuring the individual processes, since it is difficult to distinguish in experiments between vigilance, understanding and yielding (cf. Stroebe & Jonas, 1990). The relationship between the two processes is described by McGuire (1968a) as multiplicative linking, which can be represented mathematically as follows (cf. McGuire, 1968a:1143):

$$p(I) = p(R) \times p(Y) [\times p(K)]$$

$p(I)$ (“influence”) is the probability of being influenced by a persuasive message, building on the probability of adequately receiving the message $p(R)$ (“reception”) and the

probability of yielding to the message $p(Y)$ (“yielding”, i.e. acceptance). The additional probability introduced, $p(K)$, the probability of being influenced by other processes, was not taken into account by McGuire in his further theoretical considerations (in square brackets), thus reducing the equation to the first two processes mentioned.

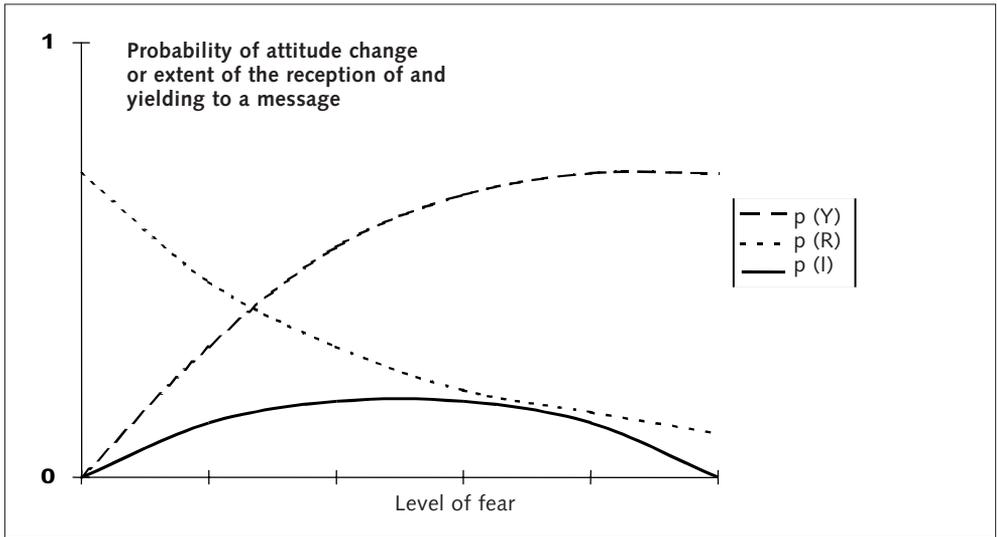


Fig. 2.6: Relation between the intensity of fear and the processes of yielding ($p[Y]$) and reception ($p[R]$), as well as the resultant probability of attitude change ($p[I]$) (from McGuire, 1978:172).

As regards the significance of fear appeals, McGuire (1968a, 1968b, 1978), like Janis, propounded the hypothesis of an inverse U-shaped relationship between the intensity of the fear and the extent of the attitudinal change. However, differences between the theories of the two authors become clear in the theoretical reasoning. McGuire refers back to the two processes of reception and yielding and assumes that the vigilance for and understanding of a communication (reception) are inhibited with increasing intensity of fear. On the other hand, the influence of the level of fear on yielding to a message is positive, meaning that the probability of yielding increases with increasing fear. As a result of the multiplicative linking of these two processes, the probability of attitude change is low in the case of very low fear, but also in the case of very high fear, whereas a high level of attitudinal change can be expected at moderate fear levels (cf. Fig. 2.6). McGuire also formulated similar hypotheses for the variable of intelligence. Here, the probability of reception of a communication increases with increasing intelligence, while yielding decreases with increasing intelligence. Here, again, the maximum attitude change can be anticipated at moderate levels of the variable (intelligence in this instance) (cf. Fig. 2.7).

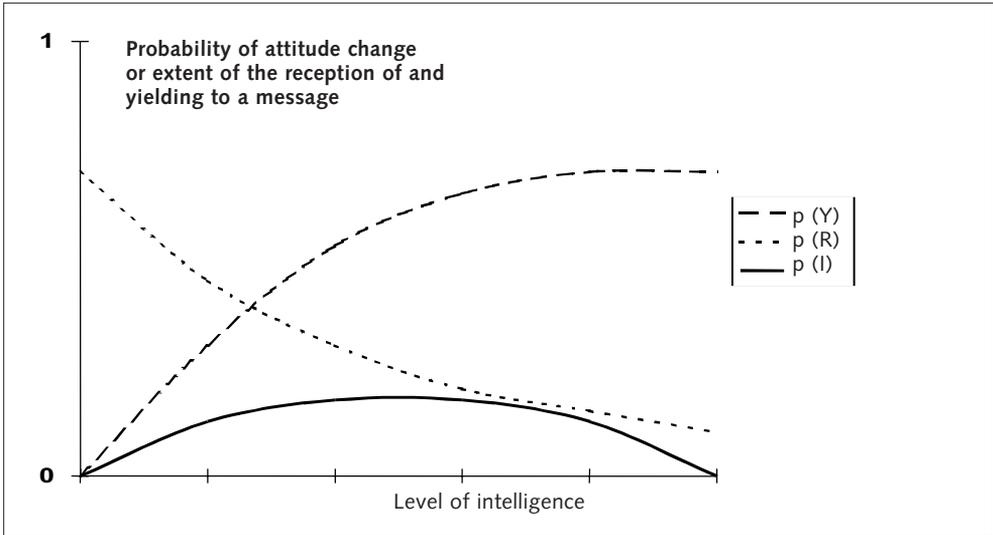


Fig. 2.7: Relation between intelligence and the probability of attitude change (McGuire, 1972, from Eagly & Chaiken, 1993:262).

Empirical studies on the Curvilinear Model

The work of Janis and Feshbach (1953) was of fundamental importance for the development of the curvilinear hypothesis. The authors were able to demonstrate that the greatest effect of a persuasive message could be achieved at low fear levels. However, this result cannot be interpreted as confirmation of the theory, since the hypothesis of curvilinearity predicts the greatest change in behaviour at moderate fear levels. Other studies attempted to confirm the curvilinear hypothesis with an analogous study design. The prerequisite for empirical testing of a curvilinear relationship between intensity of fear and attitude change is that the intensity of fear induced be divided into at least three stages. The review paper by Jonas (1987) mentions only few studies which meet the criterion of a breakdown of fear into at least three stages (Chu, 1966; Leventhal & Niles, 1965; Leventhal & Watts, 1966; Ramirez & Lasater, 1976; Skilbeck, Tulips & Ley, 1977; Kohn, Goodstadt, Cook & Chan, 1982; Schützenhöfer & Knoch, 1991).

The study by Leventhal and Niles (1965) distinguished only according to the length of the showing time of fear-arousing films on road safety, which is a problematical form of operationalisation of intensity of fear. Four excerpts of different lengths from films on car accidents were used as fear-arousing messages, these subsequently being followed by the recommendation that a seat belt should be worn. Attitudes to driving a car were recorded at various times after showing the film. In their study, Leventhal and Niles were able to demonstrate that willingness to behave more safely in traffic increased with increasing length of the presentation, which contradicts the curvilinear hypothesis.

Studies will be presented below which have undertaken an explicit test of the curvilinear relationship. Leventhal and Watts (1966) used participation in an X-ray examination directly after the experiment and the reduction of smoking after five months as dependent variables in their study of smokers smoking different amounts. With respect to the intention to give up smoking, a curvilinear trend could be shown among smokers who regarded themselves as being fairly invulnerable to disease. In parallel to this, there was less demand for the X-ray examination with increasing fear. By way of contrast, the actual reduction in smoking was greatest in the group with the greatest induced fear. This investigation is thus both a confirmation and a contradiction of the curvilinear hypothesis (cf. *Section 2.2.3* for an explanation of the results).

The study by Chu (1966) investigated the efficacy of fear arousal messages regarding a parasitic disease and checked the subsequent intake of preventive medication. The level of fear was varied in three stages, (primarily) by way of the presentation of different frequencies of disease. Chu was able to demonstrate primary effects of the induced fear and of the presented effectiveness of taking medication on the basis of the desire to take preventive medication. This study can therefore be regarded as evidence of a linear relationship between fear and attitudinal change.

Skilbeck, Tulips and Ley (1977) initially observed no primary effect of fear intensity on weight loss within a weight reduction programme. It was only when the test subjects were reclassified on the basis of a subjective fear rating that confirmation of the curvilinear hypothesis was obtained. Weight loss in the group with moderate fear induction was significantly greater than in the group with low or high fear (the presentation does not make it clear at what time this applied).

Among other things, Ramirez and Lasater (1976) investigated tooth-brushing behaviour in school pupils after induction of fear (three stages). No primary effect of the induced fear on tooth-brushing was apparent after one day or one week. However, no confirmation of the curvilinear trend was found either.

The study by Kohn, Goodstadt, Cook, Sheppard and Chan (1982) on road safety also failed to yield any confirmation of the curvilinear relationship. The strongest attitude change was reported by people after low or high fear induction, while lesser effects were seen on moderate fear induction. In overall terms, however, all the groups had returned to their starting levels with respect to knowledge and attitude after six months. Only at the behavioural level did people exhibit a trend towards less risky driving behaviour after low-level fear induction (although the differences were not significant).

Schützenhöfer and Knoch (1991) studied the effect of aversive content in road safety advertising on driving behaviour and on attitudes with respect to wearing a seat-belt and other variables relating to safety (cf. also Roth, Derler & Schützenhöfer, 1990). The level of fear was varied by presenting the results of an accident in variously drastic forms, showing se-

riously injured people in the high fear level group, slightly injured people for moderate fear levels and dummies for low fear induction. No uniform trend was seen with respect to the effect of the level of fear on traffic-related attitudes. The authors describe the results as non-uniform and the only statements they were able to make applied to certain sub-groups of test subjects under highly specific conditions. This study cannot be interpreted as confirmation of the curvilinear hypothesis.

In summary, it can be stated that, in the empirical studies carried out to date which have been explicitly concerned with the curvilinear model, only few authors have varied fear levels in at least three stages. Only two of these studies were able to support the hypothesis by Janis and McGuire that the increase in fear is accompanied by a curvilinear progression for attitudinal change or implementation of preventive behaviour. The majority of the studies failed to find this relationship and support the hypothesis of a linear relationship between induced fear and an attitude change or behaviour.

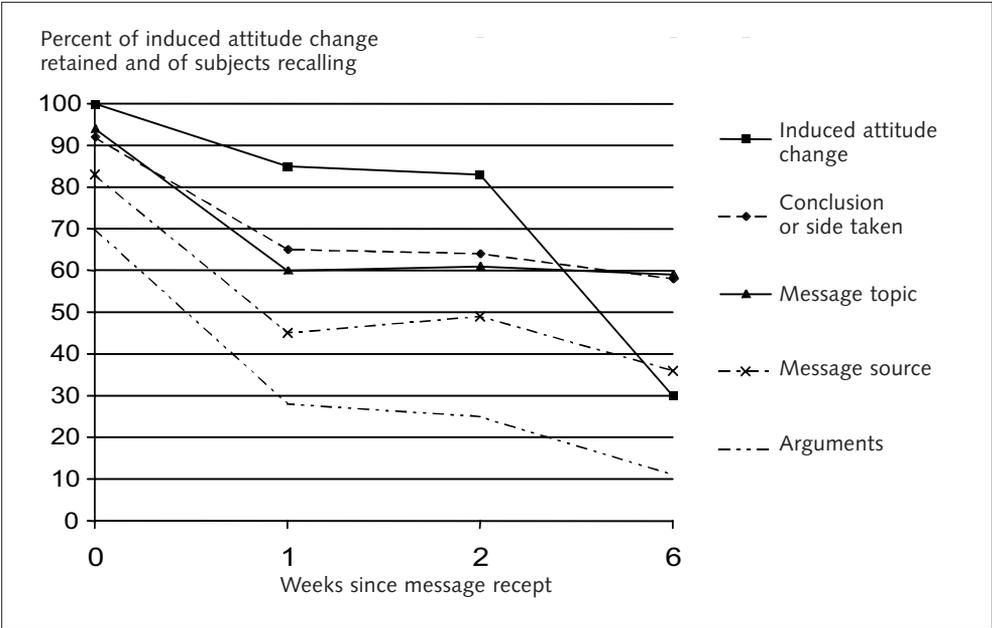


Fig. 2.8: Temporal decay of induced attitude change and of recall for each of four aspects of the persuasive message (Watts & McGuire, 1964; from Eagly & Chaiken, 1993:268)

McGuire's theory on the efficacy of fear-arousing communications has also been tested empirically. Numerous papers relating to the reception process are available from the group working with McGuire, while studies on acceptance of the arguments presented (“yielding”) play a somewhat subordinate role. On the basis of the results of the recall experiments by Ebbinghaus (1885), who found that forgetting runs in an exponential curve (“forgetting curve”), many studies were carried out into the perception and retention of informa-

tion from persuasive messages. The study by Watts and McGuire (1964) will be mentioned by way of example (cf. Fig. 2.8). It tested not only attitudinal change, but also retention efficiency relating to the message topic, its position, its source and its arguments. While Ebbinghaus' forgetting curve could be seen for these areas, the induced attitude change (top line) followed a different curve. This illustrates the need for other processes (for McGuire, the process of yielding) to explain changes in attitude.

The empirical studies undertaken in relation to McGuire's theory are chiefly concerned with the process of receiving information. Yielding to messages, on the other hand, has been the subject of far less research, with the result that this part of the theoretical model can be described as having been subject to little empirical testing. Reference should be made to the comments above with respect to the hypothesis of a curvilinear relationship.

Assessment of the Curvilinear Model

Jonas (1987) raises the following criticism of the theories of Janis and McGuire: the lacking possibility of falsifying the theories (cf. also Leventhal, 1970) and the absence of a prediction of the level of fear (or of intelligence) above which defence reactions occur or the induced fear has counterproductive effects. Jonas therefore suggests that, in future studies, the level of fear induced be divided into a large number of degrees, so as to investigate a variable which is "as interval-scaled as possible" (in contrast to the variables in the studies discussed above, which generally use an ordinal scale). A further problem in assessing the theories lies in the lack of comparability of different experiments, since the level of fear was operationalised and measured in different ways.

From a present-day perspective, the curvilinear hypothesis by Janis and McGuire (and other authors) can be regarded as having been empirically refuted. Sutton (1982) and Boster and Mongeau (1984), in their meta-analyses of the influence of fear on the extent of changes in attitude or behaviour, arrive independently at the conclusion that a linear relationship must be assumed. In spite of these results, which have been published for some time now, the "myth of the inverted U function" (Sutton, 1992) remains intact. This is also confirmed by the review of numerous textbooks by Allen and Preiss (1990). The authors found that, in the majority of textbooks, the results of the meta-analyses by Sutton or Boster and Mongeau were ignored and that the curvilinear hypothesis is reproduced without comment in more than 50% of textbooks dating from the 1980s. At the same time, the methodological limitations of the review papers by Sutton (1982) and Boster and Mongeau (1984) must be pointed out. Both papers draw, in particular, on studies without a control group design and on studies with only a two-stage variation in fear when testing the influence of fear level on attitudinal change. However, these studies allow only conditional statements to be made regarding the curvilinear hypothesis, since no three-stage variation of the fear level is present. Interpretation of the results should be undertaken with this important methodological limitation in mind. However, if studies with three and more fear levels are used to test

the influence of fear on changes in attitude and behaviour, the results found by Sutton and by Boster and Mongeau are confirmed. In overall terms, of seven studies with experimental variation of three fear stages, only two uphold the curvilinear hypothesis.

2.2.3 The Parallel Response Model

The theory devised by Leventhal (1970) attempts to dissociate itself from the drive theories presented above. According to Leventhal, the monocausal relationship between level of fear and extent of attitudinal change is insufficient, since it disregards the way in which persuasive messages are processed. For this reason, Leventhal distinguishes between the two processes of risk control and fear control as reactions to confrontation with fear appeals. Leventhal (1970) believes this distinction to be necessary since fear-arousing Communications usually contain two different items of information: first, information describing the risk and thus triggering fear and, second, information as to how the risk can be avoided.

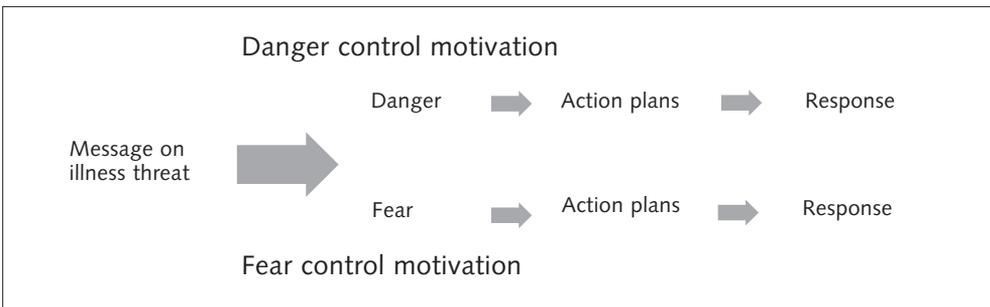


Fig. 2.9: Dual Process Model of the processing of fear-arousing communications (Leventhal, Safer & Panagis, 1983:11).

Analogously, Leventhal distinguishes between the two processes of fear control and danger control, which he described in his 1983 revision of the theory (Leventhal, Safer & Panagis, 1983) as a subjective-emotional process and an objective-cognitive process. Leventhal sees danger control (objective-cognitive process) as being a direct effort to combat a potential risk (such as liver damage) by means of appropriate behaviour (such as abstaining from alcohol). In Leventhal's opinion, the process of danger control is a problem-solving process in which information from external sources (e.g. information from the communication itself) or from a person's own experience with a specific behaviour determine his or her action. Fear control (subjective-emotional process), on the other hand, serves to reduce unpleasant emotions by means of cognitive defence reactions or stress-relieving actions, such as eating, reading and the like, while fear appeals are being received. While

Leventhal (1970) originally viewed these two processes as parallel reactions and assumed that successful danger control was usually also accompanied by successful fear control, he later took up a different position (cf. Leventhal, Safer & Panagis, 1983). He now described his theory as a dual process model and assumed that the two processes of fear and danger control run independently of one another. This is partly owing to the fact that the fear generated is only of relatively short duration, while the cognitive representation of a danger lasts longer. On the basis of these assumptions, he arrives at the following conclusions regarding the interaction of fear control and danger control (cf. also Fig. 2.9):

1. The two motives, subjective fear and objective danger can be independent.
2. The objective-cognitive representation of the danger can be independent of the action plan.
3. Action plans for dealing with the objective-cognitive representation of an external danger may be independent of, and/or interact with, plans for dealing with the subjective fear elicited by the danger.

(Leventhal, Safer & Panagis, 1983:11.)

Empirical studies on the Parallel Response Model

Studies on the curvilinear hypothesis, the role of self-esteem in the reception of persuasive messages, and the function of specific instructions for implementing behaviour are presented below.

Curvilinear hypothesis

Leventhal was unable to find any confirmation in his work of the curvilinear relationship between the intensity of fear and a change in behaviour. At the same time, it must be emphasised that (on incorporating the processes of danger control and fear control) he did find heterogeneous results, depending on the criterion. For example, the study by Leventhal and Watts (1966) demonstrated a lower demand for a subsequent X-ray examination in heavy smokers with increasing induced fear. However, the finding of a linear relationship between the intensity of fear induction and subsequent self-limitation of smoking does suggest the involvement of various processes in processing the persuasive message (cf. *Section 2.2.2* for a summary). Leventhal and Watts see the reason for these apparently contradictory results in the initially fear-inducing nature of an X-ray examination. In order to control this fear (fear control), people with high induced fear take part less often in the examinations, but this is followed by danger control to reduce long-term risks, which was demonstrated in a reduction of cigarette consumption (cf. also Leventhal & Trembly, 1968).

On the basis of these findings, Leventhal arrives at the conclusion that the curvilinear hypothesis cannot be upheld in its original form. Rather, it must be assumed that a greater degree of implementation of recommendations (danger control) will be seen with in-

creasing fear. Contrary reactions can be attributed to the fear-control process but will, however, be of no major long-term significance since the fear quickly disappears over time.

Self-esteem in the reception of persuasive messages

In Leventhal's model, apart from situational characteristics, personality characteristics of the receiver of a message are also of major importance. He concentrated on the "self-esteem" dimension in his studies. Leventhal hypothesised that people with different levels of self-esteem would be receptive to different forms of persuasion. This extremely general hypothesis, formulated with no theoretical reasoning, was specified by Leventhal in his research activities. The basic assumption was that people with higher self-esteem would react to threats with more active coping behaviour than people with low self-esteem (cf. Dabbs, 1964). This hypothesis was empirically tested in the study by Dabbs and Leventhal (1966): test subjects were given information about the benefits of tetanus vaccination and the independent variable, fear, was varied at the same time. The self-esteem of the test subjects was recorded. People with high self-esteem revealed an increase in the intention to have a protective vaccination with increasing fear, while people with low self-esteem reported a strong intention to act, regardless of the level of fear. In a study using films of car accidents at different speeds, Leventhal and Trembly (1968) were able to show that people with high self-esteem had a greater intention to drive more carefully in the future. In addition, an interaction was seen between self-esteem and the level of fear. In people with high self-esteem, there was a connection between fear level and intention. The converse was shown for people with low self-esteem, i.e. a lower intention was reported at higher fear levels.

However, Leventhal draws no conclusions from these results as regards the design of preventive information. The question as to the general applicability and validity of the findings also arises, since the scale used in the studies to record self-esteem (20 or 44 items with seven-step ratings) is more a global measurement and was not adequately checked in terms of test theory. Rosen, Terry and Leventhal (1982) conducted test theory analyses with the items of this scale and rejected the original form of the scale. In terms of content, the authors see a proximity between Leventhal's self-esteem construct and the concept of expected self-efficacy devised by Bandura (1977), which was still relatively new at that time. In contrast to the construct of self-esteem, Bandura's theory offers a far tighter definition of expected self-efficacy and hence substantial methodological and empirical advantages.

Function of specific instructions

Many research papers by Leventhal dealt with the significance of specific instructions for the efficacy of persuasive messages. His hypothesis was that specific instructions cause a greater change in behaviour than the induction of fear alone. Leventhal, Singer and Jones (1965) investigated recommendations to have a tetanus vaccination. Different levels of fear were varied (by depicting consequences) and the receivers were either given or not given concrete instruction (institution, location, opening hours) for realising the recommendations. The result observed by the authors was that specific instructions were required to achieve high levels of implementation of the measures recommended. Fear induction alone

was less successful than the additional instruction for implementing the recommendations after a message with high fear induction (cf. also Leventhal, Jones & Trembly, 1966). In another study on the significance of specific instructions, Leventhal, Watts and Pagano (1967) found that, in smokers who, following fear induction, had been given specific instructions for reducing their smoking behaviour in the form of a guide, there was a greater reduction of cigarette consumption than in people who had only seen a fear-inducing film (cf. also Leventhal & Slade, 1964; Leventhal & Singer, 1966).

Assessment of the Parallel Response Model

Leventhal reaches the following conclusions derived from the results of his studies:

1. The effects of fear tend to be short-lived, with enhanced motivation, attitude change, and behavioural change dissipating within a week.
2. If threat is to lead to change in behaviour in addition to change in attitude, one must add specific action instructions to the threat message.. The aim is to communicate action skills to the person concerned in such a way as to enable him or her to alter his or her behaviour in concrete situations of everyday life.
3. Individual differences in the area of self-esteem play a significant role in response to fear messages.

(Leventhal & Hirschman, 1982:195.)

With their concepts of fear control and danger control, the studies by Leventhal are important expansions for explaining the partly contradictory empirical findings relating to the curvilinear hypothesis. Leventhal works from the assumption that fear control acts on a short-term basis with the defence processes hypothesised by Janis taking effect here. In the long term, on the other hand, danger control develops, with implementation of preventive recommendations as defined in the message, even in the case of high levels of induced fear. These two constructs allow more differentiated consideration of the curvilinear hypothesis, with Leventhal's work suggesting the hypothesis of a linear trend.

Unfortunately, testing of the theoretically formulated processes has remained unsatisfactory in overall terms, since the processes of fear control and danger control were not explicitly separated in the experiments. Nor do the theories presented above in relation to the link between the two processes offer much in the way of precise information as to the situations in which one or the other process is to the fore. Important assumptions and predictions of the theory remain untested, meaning that the theories formulated tend more to reflect a heuristic framework. The studies on the importance of self-esteem yielded empirically non-uniform findings. Specification has been undertaken in this area recently, using the concept of expected self-efficacy.

The findings on the significance of specific instructions are of major practical relevance for the design of preventive information. It can be deduced from these findings that fear

appeals should never be used without instructions for controlling the fear, since this is the only way of achieving effective danger control. This means that the threshold for implementation of the recommendations must be kept as low as possible for effective preventive message design, so that the receivers of a persuasive message which triggers fear are given the possibility of reducing the fear by means of appropriate action.

2.2.4 The Protection Motivation Theory

The aim of the original formulation of the protection motivation theory was to specify the characteristics of fear appeals (Rogers, 1975). Rogers assumed the following three areas as the determining variables of fear appeals:

- The severity of the threat,
- The probability of occurrence of the event,
- The availability of an effective protective measure.

The primary assumption was that these three areas of variables have a fundamental influence on the motivation to implement a protective measure, with Rogers working from the assumption of a multiplicative link between the components (cf. Rogers, 1975). In the more recent version of this theory (Rogers, 1983; Maddux & Rogers, 1983), this multiplicative link between the individual components was abandoned in favour of an additive link, since the multiplicative form of the link could not be replicated in many studies (cf. Jonas, 1993). In the revised form of his theory, Rogers distinguishes between the two components “threat appraisal” and “coping appraisal”. The processes of threat appraisal and coping appraisal run largely parallel to one another and result in the protection motivation. Thus, the revised form of the theory developed from accentuation of fear appeals for health behaviour to a general theory of health behaviour. The following conditions must be met in order for protection motivation, and thus preventive behaviour, to develop (cf. Fig. 2.10):

1. Perception of the severity of the threat,
2. Perception of personal risk (vulnerability),
3. Expectation of skill with respect to implementation of the necessary measure,
4. Assumption of effectiveness of behaviour,
5. Rewards for inappropriate coping are cancelled out by the inhibiting factors of unfavourable coping,
6. Factors encouraging adaptive coping outweigh their costs.

At least two situations can be described in the framework of protection motivation, where, in spite of a major threat, a person does not see himself as being in a position to protect

himself. This may be the case if the only coping strategy available is ineffective or if the person believes that he is unable to perform the behaviour required. From the perspective of the protection motivation theory, the use of emotional appeals takes high priority: information regarding a threat to health from the environment and intrapersonal factors (sources of information) trigger subjective analysis of the threat. The severity and the person's own vulnerability are assessed together with the reward value of the behaviour; these increase or decrease the probability of the risky behaviour.

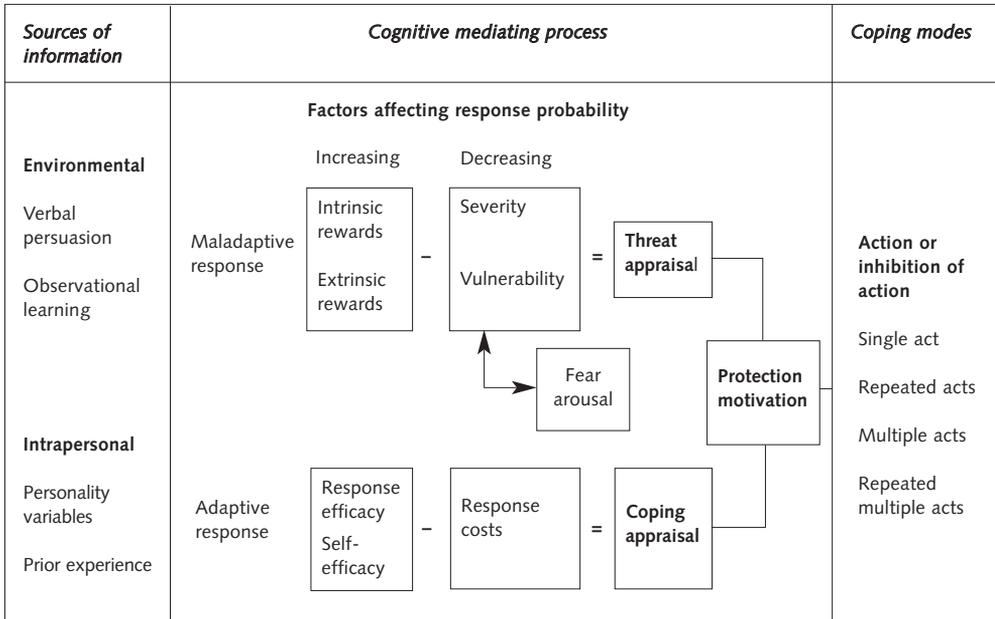


Fig. 2.10: Schema of Protection Motivation Theory (Rogers, 1983: 168).

Empirical findings on the Protection Motivation Theory

Empirical findings on the protection motivation theory and its individual components will be presented below (for an overview from the point of view of its adherents, cf. Rogers & Prentice-Dunn, 1997; Prentice-Dunn & Rogers, 1986; Rogers, 1983). The significance of the variable of perceived severity has been proved for the target behaviour areas of smoking (Rogers & Deckner, 1975; Rogers, Deckner & Mewborn, 1978), alcohol consumption (Stainback & Rogers, 1983), relaxation training (Bonfilio, 1982) and compliance in dental treatment (Beck & Lund, 1981). The importance of perceived vulnerability was shown in giving up smoking (Maddux & Rogers, 1983), participating in sport training programmes (Wurtele & Maddux, 1987) and in the prevention of osteoporosis in women (Wurtele, 1988). Empirical confirmation for the variables of expected conse-

quences and expected skills in health and preventive behaviour is found in Rogers and Mewborn (1976), Shelton and Rogers (1981), Beck and Lund (1981), Rippetoe and Rogers (1987), Wurtele and Maddux (1987). As yet, there have been relatively few studies in the German-speaking countries which test the model assumptions of the protection motivation theory (cf. Bengel, 1993).

Table 2.2. presents the studies listed in the review paper by Rogers and Prentice-Dunn (1997) from an extremely wide range of subject areas. The tables allow an overview of the variables tested in the studies and the significant influences of these on behaviour or intention (results which were not significant are marked with a ^b). The authors stress that no meta-analytical procedure is involved here, with effect levels calculated to estimate the influence of the individual areas of variables. Nonetheless, it is clear that numerous studies are available which have been carried out on the basis of the protection motivation theory and its associated components, and which can confirm the importance of the individual components. In overall terms, only a few studies can be found where the influence on the target variables is not significant, which largely supports the theoretical assumptions. However, this consideration does not take account of the way in which the variables are linked. Moreover, the review also reveals an important methodological problem in the studies: in many cases, the independent variables were not manipulated (marked with an ^a), so that the underlying model was frequently proven only by means of quasi-experimental studies. Changing the independent variables would permit better application of the results to the design of preventive information. In contrast, quasi-experimental studies allow only the conclusion that the model variables (severity of the threat, vulnerability, expected skills and expected consequences) have an influence on behaviour, and it is not possible to deduce from this how and in what manner these model variables can be changed. The study by Sutton and Hallett (1988) can be mentioned by way of example, where test subjects were to be persuaded to smoke less: the test subjects were shown either a film on the negative consequences of smoking or a film on the results of accidents where seatbelts were not worn. The model variables (vulnerability, severity, etc.) were then assessed on the basis of the film viewed and, in turn, used as predictors of the intention to reduce smoking. The problem with this experimental design is that, in the majority of cases, the film with the appropriate content yielded higher scores than the control film, but that design features of the film with the appropriate content were largely not taken into account. This means that operating variables of media cannot be identified on the basis of this procedure, since only the intervening processes of an attitude change are considered.

Study	Topic	Variables
Rogers & Thislethwaite (1970)	Smoking (I)	S, RE
Hass, Bagley & Rogers (1975)	Smoking (I) Energy conservation (I)	S, V ^b
Rogers & Deckner (1975)	Smoking B	S, RE
Griffeth & Rogers (1976)	Safe driving (I), driving errors (B)	S
Rogers & Mewborn (1976)	Smoking (I) Smoking (I), safe driving (I), avoidance of sexually transmitted diseases (I)	S RE
Rogers, Deckner & Mewborn (1978)	Smoking (B)	S
Mewborn & Rogers (1979)	Avoidance of sexually transmitted diseases (I)	S ^b , V
Shelton & Rogers (1981)	Helping endangered species (I)	S, RE
Maddux & Rogers (1983)	Smoking (I)	V, RE, SE
Stainback & Rogers (1983)	Alcohol abstention (I)	SV
Sutton & Eiser (1984)	Smoking (I)	SE ^c
Calantone & Warshaw (1985)	Political election (I)	SV
Rogers (1985)	Inoculation against a virus (I)	S, V, RE
Stanley & Maddux (1986)	Regular exercise (I)	RE, SE
Wolf, Gregory & Stephan (1986)	Action against nuclear war (I)	S ^a , V ^a , RE ^a , SE ^a
Rippetoe & Rogers (1987)	Breast self-examination (I)	SV, RE, SE
Sutton, Marsh & Matheson (1987)	Smoking (I)	SE ^a
Wurtele & Maddux (1987)	Regular exercise (B)	S, V, SE
Calnan & Rutter (1988)	Breast self-examination (B)	RE ^a
Robberson & Rogers (1988)	Regular exercise (I)	S
Sutton & Hallett (1988)	Smoking (I)	RE ^a
Wurtele (1988)	Calcium intake (B, I) Calcium intake (I)	V RE
Allard (1989)	AIDS-preventive actions (B)	S ^a , V ^a
Campis, Prentice-Dunn & Lyman (1989)	Parental education of children about child sexual abuse (I)	RE, SE, RESE
Sutton & Hallett (1989a)	Smoking (I)	RE ^a , SE ^a
Sutton & Hallett (1989b)	Seat belt use (I)	RE ^a
Tanner, Day & Crask (1989)	Condom use (I)	V, SE

Table 2.2: Review of English-language studies of the Protection Motivation Theory (from Rogers & Prentice-Dunn, 1997).

Study	Topic	Variables
Steffen (1990)	Testicular self-examination (I)	V^a, RE^a
Peterson, Farmer & Kashani (1990)	Parental action to prevent children's injuries (B)	RE^a
Rhodes & Wolitski (1990)	Perceived effectiveness of AIDS poster (B)	S, RE^b
Seydel, Taal & Wiegman (1990)	Breast self-examination (I) Cancer prevention (I) Cancer prevention (B)	S^a RE^a, SE^a RE^{ab}, SE^{ab}
Self & Rogers (1990)	Safe-sex behaviours (I)	RESE
Sutton, Marsh & Matheson (1990)	Smoking (I)	S^a, RE^a
Ahia (1990)	Safe-sex behaviours (I) Safe-sex behaviours (B)	S^a V^a, RE^a, SE^a
Aspinwall et al. (1991)	Number of anonymous sex partners of homosexual men (B)	V^a, RE^a, SE^a
Axelrod & Newton (1991)	Action against nuclear war (I)	S^a, V, RE^a, SE^a
Hine & Gifford (1991)	Commitment to stop pollution (I), financial donations (B), time commitment (I) ^b	S
Kelly, Zyzanski & Alemagno (1991)	Smoking (I), stress reduction (I), proper nutrition (I), seat belt use (I), regular exercise (I)	RE^a, SE^a
Knapp (1991)	Reduction in tooth plaque (B)	SV
Smith Klohn & Rogers (1991)	Osteoporosis prevention (I)	S
Tedesco, Keffer & Fleck-Kandath (1991)	Tooth brushing (B), flossing (B)	SE^a
Weinstein, Sandman & Roberts (1991)	Radon testing kit (B), use of kit (I) Radon testing kit orders (B)	S V
Fruin, Pratt & Owen (1992)	Regular exercise (I)	SE^a
Gleicher & Petty (1992)	Crime prevention (I)	SV
Ho (1992)	Smoking (I)	SE^a
Lieberman & Chaiken (1992)	Caffeine consumption (I)	V
Marcus & Owen (1992)	Regular exercise (B)	RE^a, SE^a
McCauley (1992)	Regular exercise (I)	SE^a

Table 2.2: (continued)

Study	Topic	Variables
Mermelstein & Riesenbergr (1992)	Precautions against skin cancer (I), sunscreen use (B)	V ^a
Winett et al. (1992)	HIV preventive skills (B)	SE
Lynch et al. (1992)	Exercise program for high cholesterol (B)	S ^a , RE ^a
Allen (1993)	Action against nuclear war (I)	S
Taal et al. (1993)	Regimen for rheumatoid arthritis (B)	SE ^a
Vaughan (1993)	Protection against pesticide misuse (B)	V ^a , RE ^a , SE ^a
Wulfert & Wan (1993)	Condom use (I)	RE ^a , SE ^a
Plotnikoff (1994)	Cardiovascular disease prevention (I)	RE ^a , SE ^a
Pointer & Rogers (1994)	Moderation of drinking alcohol (I)	SV
Sutton et al. (1994)	Mammography (B)	V ^a , RE ^a
Sturges & Rogers (1996)	Smoking (I) Smokless tobacco (I)	SV ^b , RESE RESE
McElreath, Prentice-Dunn & Rogers (1997)	Children's use of bicycle helmets (I)	SV, RE ^b , SE ^b

S = severity

V = vulnerability

SV = combination of severity and vulnerability

RE = response efficacy

SE = self-efficacy

RESE = combination of response efficacy and self-efficacy

I/B: The topic was assessed with measures of intention (I) or with behavioural measures (B).

^a: The independent variable was not manipulated.

^b: No main effect or interaction was found with the independent variable.

Table 2.2 (continued)

By way of example, a selection of studies which have dealt with topics relevant to health will be presented below. This is intended to illustrate the methodological procedure and the relevance of this approach for the design of preventive measures.

Rogers and Thislethwaite (1970) studied 40 smokers and 40 non-smokers regarding their attitudes to smoking and their assessment of the risks of smoking after an audiovisual presentation. The film shown differed in its depiction of the consequences of cigarette smok-

ing in that in only one version of the film was a lung operation shown (corresponding to the high fear condition). In addition, the expected outcome was experimentally manipulated by a leaflet to be read after the viewing. This leaflet presented the positive consequences of reducing cigarette consumption (less risk of developing lung cancer) as either uncertain or as extremely likely (high versus low expected outcome). With respect to the conviction that smoking causes lung cancer, a primary effect was seen suggesting that a high expected outcome (i.e. the depiction of a high-probability link between smoking and lung cancer) resulted in a high appraisal of the benefits derived from giving up smoking. As regards attitude towards smoking, both smokers and non-smokers exhibited significant interaction effects between fear induction and the description of the expected outcome. People in the high fear induction group, combined with the presentation of a high degree of effectiveness of giving up smoking, reported the strongest levels of intention to stop smoking or not to start smoking.

The study by Rogers and Mewborn (1976) is based on Rogers' original concept of fear appeal research. The three variable areas of high versus low level of emanating risk, high versus low probability of the event, and high versus low expected outcome of the countermeasure, were varied. In terms of content, this study referred to the following three areas: safe driving, cancer and smoking, the dependent variables of which were tested by way of intentions. One primary effect on intention was seen, caused by the assessment of the effectiveness of a measure. In addition, in the smoking study, there was also a significant interaction effect between the assessment of effectiveness and the probability of the occurrence of the event: intention was least pronounced with a high probability of occurrence and an ineffective portrayal of the preventive behaviour. The assessment of effectiveness, and hence the expected outcome, was the strongest overall predictor for intention.

Maddux and Rogers (1983) attempted to confirm the protection motivation theory in its revised form with respect to the linking of the variables, again using a study of smoking behaviour. They showed that the intention of the smokers to reduce their cigarette consumption is influenced by experimental manipulation of expectations regarding the negative consequences of continued smoking (costs), the positive consequences of reduction (benefits), and the perception of abilities (skills). Higher values for these variables produced stronger intentions to reduce nicotine consumption. Expected skills are the strongest predictor for the intentions to change.

Bengel (1993; 1996) was able to demonstrate empirical confirmation of the theoretical model hypotheses in the area of HIV protective behaviour. According to the results of this study which, unlike many American studies, was not carried out with students, four variables act on HIV-related protective behaviour. In order of the strength of the relationship, these are as follows: expected self-efficacy with respect to sexual communicative skills; general sexual self-efficacy expectations; perceived severity of the AIDS threat; and the expected outcome of HIV protection measures.

A review of studies from the field of HIV infection can be found in the meta-analysis by Farin (1995), who reports the greatest connection between HIV protective behaviour and expected self-efficacy ($r=0.147$) or expected outcome ($r=0.133$). The mean correlation for the severity of the threat was $r=0.112$, while vulnerability exhibited a mean correlation of $r=-0.029$. These figures clearly show that, while predictions which are significantly superior to random predictions are possible using the model hypotheses and model variables of the protection motivation theory, the overall declared variance is very low.

One study of major interest for the field of prevention was conducted by Sturges and Rogers (1994). It considered the significance of fear appeals from the aspect of developmental psychology. The attitudes of various age groups (children aged 10 and 15 years, young adults aged 20) with respect to smoking were examined. In the experiment, all the subjects were shown 10-minute films with different portrayals of the negative consequences of smoking (fear arousal). In addition, the films differed in their representation of how difficult it would be in the future not to smoke or to resist cigarettes when offered. No primary effect of the induced fear was found. However, an interaction effect was seen between the induced fear and the portrayed difficulty in resisting smoking. For both juveniles and young adults, the combination of high-level fear induction with low-level difficulty proved to be the most effective. In children, on the other hand, the portrayal of low-level difficulty was decisive in terms of intention, i.e. no additive effects could be achieved by the fear arousal message. In overall terms, the results suggest different degrees of efficacy of fear appeals in different age groups.

Assessment of the Protection Motivation Theory

The protection motivation theory can be regarded as having been adequately empirically examined with respect to its individual components, but less so as regards the ideas relating to the linking of the variables. The change from the original formulation of the theory to a more complex model yields substantially better predictions of protection motivation. Thus, in addition to the threat appraisal, the appraisal of the coping strategy (particularly as a result of the concept of “self-efficacy”) is of considerable importance here. In terms of content, this results in similarities to the theoretical positions of Leventhal, who also stressed the importance of concrete instructions for action in order to cope with a threat, as a counterpoint to the perception of the threat.

The protection motivation theory has to date been used both in studies analysing health and risk behaviour and for predicting preventive behaviour. As regards the analysis of health and risk behaviour, the influencing factors of the protection motivation model can be regarded as having been adequately examined and confirmed. The theory has also been well proven in terms of the prediction of preventive behaviour as a result of receiving health-related messages. However, given the quasi-experimental nature of many of the studies, it is difficult to formulate conclusions for the design of preventive messages. Only

a few isolated variables were experimentally manipulated in controlled studies, allowing hypotheses regarding causal relationships. What proves to be a problem, however, is the fact that most empirical studies were conducted on student populations and are thus of limited general applicability.

In summary, it can be stated that the protection motivation theory is an important model for decision-making processes with respect to situations relating to health and threat situations. It allows systematic consideration of relevant variables for health-related decision-making, without describing the decision-making process itself.

With reference to the initial question as to the efficacy of fear appeals in changing health behaviour, it can be assumed on the basis of the protection motivation theory that fear appeals have a positive effect on an intended change in behaviour. However, the receiver should have sufficient coping strategies available (the second component of the protection motivation model), which are also of relevance for enacting health behaviour. Thus, the protection motivation theory arrives at similar predictions to Leventhal's theory as regards the effective design of preventive information.

2.2.5 The Elaboration Likelihood Model and the Heuristic-Systematic Model

The process of information processing of a message by the receiver is the focus of interest in the theories below, as distinct from the models discussed above. McGuire's information-processing paradigm distinguishes between receiving and yielding to a message. The two approaches described below investigated the process of yielding, in particular, on the basis of the information-processing scheme by McGuire which was presented above (cf. *Section 2.2.2*). The theories presented subsequently also led to a qualitative expansion of the definition of attitudinal change. Whereas the extent of attitudinal change was to the fore as the most important yardstick in the previously described approaches, the process and quality of an attitude change are also considered in the approaches presented here.

The elaboration likelihood model by Petty and Cacioppo (1986) (referred to below as ELM) and the heuristic-systematic model (referred to below as HSM) by Chaiken, Liberman and Eagly (1989) are theories currently being discussed to explain attitude changes as a result of persuasion. The models each assume two different routes for changing attitude by means of persuasive communication. Petty and Cacioppo (1986) describe these two processes as the central route or the peripheral route. The model devised by Chaiken, Liberman and Eagly (1989) correspondingly distinguishes between systematic processing and heuristic processing. The two theories will be discussed jointly below, since both the research methodology and the results are fundamentally the same (a fairly recent review of the two theo-

ries can be found in Eagly & Chaiken, 1993). The hypothetical processes for processing persuasive messages assumed in both ELM and HSM are characterised as follows: The central route to attitude change (which corresponds to systematic processing in Chaiken et al., 1989) is distinguished by the fact that arguments in favour of an attitude change are analysed exactly by the receiver and related to the knowledge of the person concerned. Only in the second step is a judgement made as to the content in each case, with old and new information being integrated. The quality of the arguments is relevant for the extent of attitude change. The necessary prerequisite for an attitude change is high motivation to receive on the part of the receiver, and his or her opportunity to judge the arguments with respect to their validity. The central route attitude changes are stable over time and influence behaviour. They are also stable with respect to arguments against the attitude change. The sender of a communication, wanting to achieve a lasting attitude change in a person, should therefore make every effort to achieve central information processing by the receiver (cf. Table 2.3, left-hand column).

Central (systematic) processing of the information	Peripheral (heuristic) processing of the information
<p>Prerequisites</p> <ul style="list-style-type: none"> ● Highly motivated receiver ● Ability to process the information <p>Attitude change</p> <ul style="list-style-type: none"> ● Permanent attitude change ● There is a connection between the extent of the attitude change and the quality of the arguments ● Attitude changes bring about a change in behaviour ● Attitude changes are stable in the face of counterarguments 	<p>Prerequisites</p> <ul style="list-style-type: none"> ● Motivation and intellectual capabilities not necessary for processing <p>Attitude change</p> <ul style="list-style-type: none"> ● The extent of the attitude change depends on peripheral characteristics (source characteristics, prompting nature, etc.) ● Only short-term attitude changes can be achieved ● Attitude changes have only a small influence on behaviour

Table 2.3: Central and peripheral information processing.

Information processing is referred to as peripheral if the cognitive skills or motivation of the receiver are not sufficient to receive and process a communication. Subsequent changes in attitudes will last for only a short time and are achieved by means of peripheral features of the message. Peripheral characteristics of a message may be, for example, the attractiveness of the source or the credibility of the sender. The quality of the arguments plays only a subordinate role in the persuasive effect of a message with peripheral processing (cf. Table 2.3, right-hand column).

The experiments conducted in this context all distinguish between a first group, which is given weak (or few) arguments, and a second group, which is given stronger (or many) arguments in favour of an attitude change. If the attitude change exhibited no dependence on the quality of the arguments, the information processing was considered to be periph-

eral, while, conversely, if the attitudinal change was dependent on the quality of the arguments, central information processing was assumed. Petty and Cacioppo (1986) described their complex model in graphic form as follows (cf. Fig. 2.11):

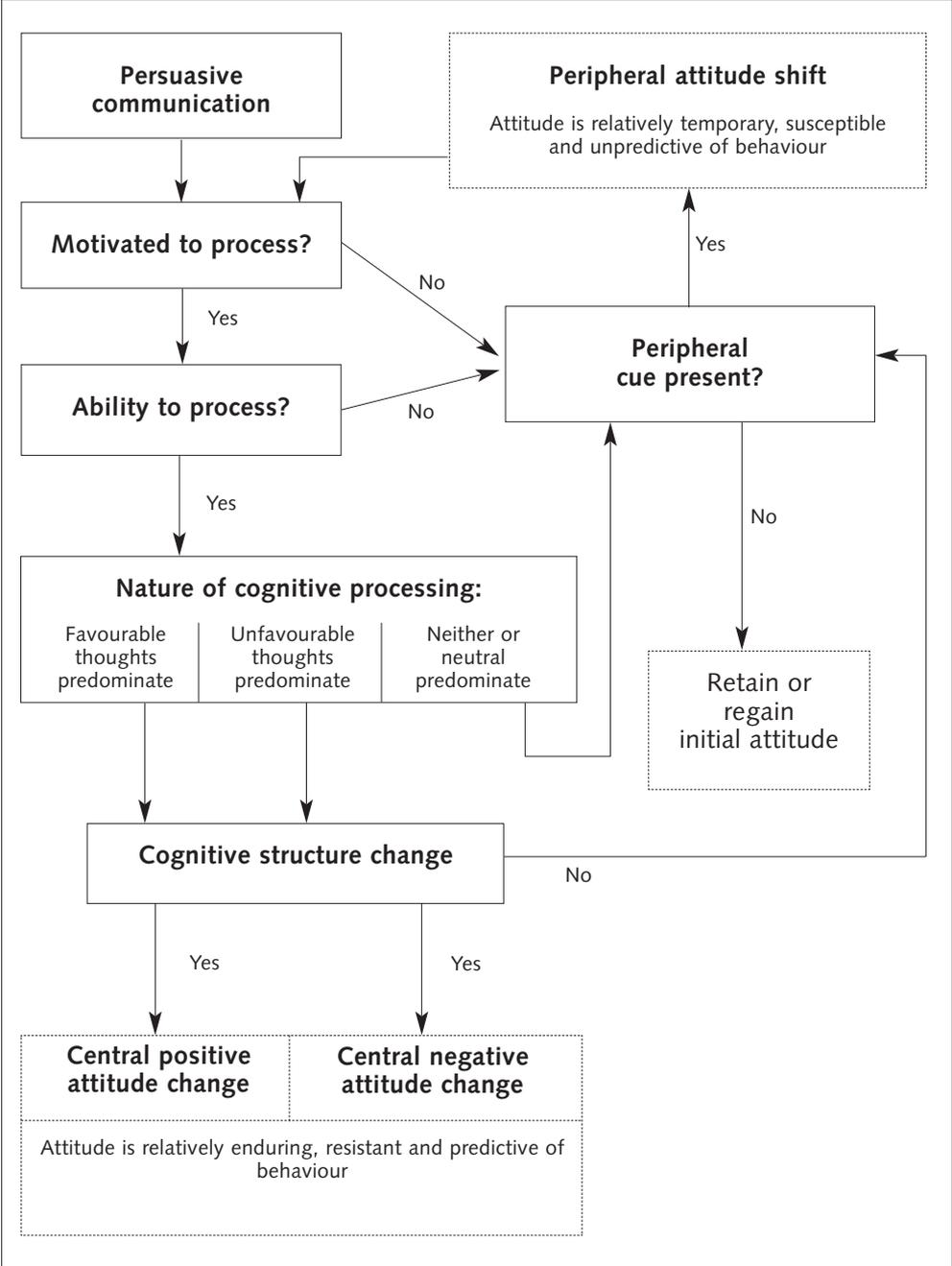


Fig. 2.11: The Elaboration Likelihood Model of persuasion after Petty and Cacioppo (1986:126).

Given a persuasive message, two prerequisites are necessary for central processing: first, the receiver should be highly motivated to perceive and analyse the arguments and, second, the receiver must have the capabilities to process the information. If both prerequisites are met, the qualitative characteristics of the message become important. If the arguments are perceived as being strong, an attitude change will follow; if the arguments are weak, the existing attitude will be consolidated or a boomerang effect will come about. Peripheral processing occurs if one of the two conditions required for central processing (capability and motivation) is not present. Only a temporary attitude change will take place, which is brought about by irrelevant characteristics of the persuasive message (such as liking for the speaker). However, no long-term attitudinal change takes place, the previous attitude rather being ultimately retained.

The assumptions underlying this model have been tested experimentally. For instance, the stability of an attitudinal change over time after central processing has been proven (cf. Chaiken, 1980; Chaiken & Eagly, 1983). The link between attitudes (after central processing) and intentions relating closely to behaviour has also been found (cf. Petty, Cacioppo & Schumann, 1983) and, in the context of voting behaviour, a good prediction of behaviour was achieved for people displaying central processing (cf. Cacioppo, Petty, Kao & Rodriguez, 1986). The assumption that an attitudinal change based on central information processing is more resistant to counterarguments was proved in the study by Wu and Schaffer (1987), for example.

Petty and Cacioppo (1986) hardly mention the importance of fear appeals and their influence on the type of information processing. Gleicher and Petty (1992) formulate the hypothesis that, in a similar way to the protection motivation theory described above, protection motivation is dependent on the threat experienced, meaning that a high-level threat will trigger a self-protective impulse. The authors further assume that those receiving messages undertake a precise analysis of the message (central processing) if they believe that they will be able to protect themselves better on the basis of the information. However, if people are already reassured by their past experiences and excessively worried by the new information, they will avoid processing the information. These assumptions are consistent with the hypotheses formulated by Janis (1967), as described above, which regarded defence processes as impediments to the persuasive effect in cases of high-level fear induction.

Empirical findings with the ELM and HSM regarding the influence of fear on attitude changes

In the empirical study by Gleicher and Petty (1992), the efficacy of fear appeals was examined using the subject "Introduction of prevention programmes for the prevention of criminal offences on the university campus". In a similar manner to the study by Rogers and Mewborn (1976; cf. *Section 2.2.4*), the authors varied the depiction of vulnerability to

an event, and also the portrayal of the anticipated efficacy of a countermeasure. Initially, a positive relationship was found between the induced fear and the attitude regarding the measure for the prevention of further criminal offences. Interesting interaction effects were also seen at the same time: under the experimental condition with low induced fear, different strengths of arguments affected attitude independently of the anticipated efficacy of the countermeasures. With high induced fear, the quality of the arguments under the condition of unclear anticipated efficacy had a significant effect on attitude while, with clear anticipated efficacy, both strong and weak arguments contributed to a highly positive assessment of the measure. The authors conclude from these results that high fear induction is more likely to result in peripheral processing (demonstrated here by the absence of an effect of the strength of the arguments). If the efficacy of a countermeasure is represented as unclear in a campaign after high fear induction, the arguments are very important (central processing), whereas peripheral processing occurs when efficacy is appraised clearly.

The study by Pointer and Rogers (1994) dealt with the attitude to excessive alcohol consumption. Persuasive messages were offered, both with and without fear arousal components, and presented either by an expert (a doctor) or a lay-person (a historian). The results again showed a primary effect on the part of the induced fear relating to the attitude to alcoholic drinks. Higher fear was associated with a greater intention to drink less. The hypothetically anticipated interaction effects could not, however, be proved. Pointer and Rogers had worked from the assumption that, under the low-fear experimental condition, hardly any differences could be demonstrated between the group given strong arguments and the group given weak arguments. Although this primary effect was confirmed, the anticipated interaction effect was not seen. Rather, there was an increase in the persuasive effect of the induced fear both in the group with strong arguments and in the group with weak arguments (a decrease in persuasive effect had been assumed in the latter group). Pointer and Rogers explain their results by the subject matter of the study: in contrast to many other studies from the field of research into attitudinal change, this study dealt with attitudes to health-related topics, where the test subjects already had a manifest prior attitude. These prior attitudes may possibly result in distorted processing which did not play any part in the experiments by Gleicher and Petty (1992), for example.

Baron, Logan, Lilly, Inman and Brennan (1994) carried out a study on “Fluoridation of the ground water”. The authors examined the effect of fear on attitudes to fluoridation. No primary effect on attitude caused by the induced fear was seen, i.e. the group with high induced fear did not have a more positive attitude. However, the results of this study do suggest that systematic information processing took place under the high induced fear condition, since there was a significant difference between the group with strong arguments and the group with weak arguments. These results thus contradict the study by Gleicher and Petty (1992). The authors explain this by the fairly low fear induction in this study and by the fictitious consequences of violence on the university campus which have little rele-

vance (as a result of previous experience) for a majority of the test subjects, unlike dental treatment.

Jepson and Chaiken (1990) carried out two studies investigating the inhibiting influence of chronic fear on systematic information processing. In the two studies on cancer, the authors tested, among other things, whether people with varying degrees of fear of cancer differ in the number of logical errors found (in the arguments contained in the message). The initial hypothesis was that chronic fear of cancer prevents systematic processing. The results confirmed this hypothesis and also showed that the capacity for systematic processing decreased with increasing fear. The authors are unable to give a final answer as to the extent to which the explanation of this connection can be found in reasons of motivation or in limitations of processing capability. However, the authors see their work as an important confirmation and further development of the curvilinear hypothesis (cf. Janis & Feshbach, 1953; Janis, 1967; Hovland, Janis & Kelley, 1953). The lower motivation or capacity to process the relevant information is seen by the authors as proof of the avoidance of perception of unpleasant emotions.

The study by Liberman and Chaiken (1992) explicitly examined the defensive mechanisms in the processing of persuasive communications in women. In this study, the persuasive message was aimed at changing attitudes with respect to the amount of coffee consumed. A fictitious link to a lung disease was given as the reason for reducing coffee consumption. Under the high-threat conditions, reference was made to a report in a professional journal which confirmed previously reported results regarding this link while, in the less threatening alternative group, the link was not backed up by current findings. Initially, the authors found that the personal relevance of the message had a primary effect on the subjective assessment of the probability of a link between a disease and the amount of coffee drunk. In the presentation of the results, the sample was then broken down on the basis of coffee consumption into women for whom the message was highly relevant (coffee drinkers) and women without this personal relevance (women who did not drink coffee). While women for whom the topic had little relevance believed more strongly in a link, coffee drinkers reported a significantly lower probability of a link between coffee consumption and a disease. However, what is more important is the result that women for whom there was greater relevance read the reassuring parts of the message less critically than the disturbing portions. The authors thus came to the conclusion that the personal relevance of a fear-arousing message leads to defence processes.

Assessment of the models

The assumptions of the ELM and HSM offer important starting points for understanding information processing and integration by way of persuasion. However, the assumptions are hypothetical and experimentally confirmed only in part. Behavioural predictions on the basis of attitudinal changes after systematic or central processing of a persuasive message, in

particular, must be described as speculative, since only little empirical proof with behaviour-related variables is available here. At the same time, it must be emphasised that the experimental studies in the context of the ELM and HSM have investigated the importance of numerous sender-related or message-related characteristics (e.g. expert status, density of information), and of receiver-related parameters (e.g. the motivation to deal with a subject intellectually), and have found consistent results. The heuristic value of the theoretical assumptions is thus beyond question.

The experimental findings offer only few concrete indications for the design of persuasive messages. So far, it has been possible to describe a few general relationships concerning which design characteristics consistently lead to central or peripheral processing of persuasive messages. These characteristics mostly refer to the capacity or motivation for processing a persuasive message. For example, external interference factors and the rapid presentation of arguments reduce the probability of precise analysis of the arguments (cf. Smith & Shaffer, 1991), i.e. the message will tend to be processed peripherally. The importance of emotions in processing persuasive messages, on the other hand, remains largely unclear. Several studies are already available on the influence of mood on information processing, Bless, Bohner and Schwarz (1991) offering competing hypotheses to explain the connection¹. The experiments carried out in this context yield a non-uniform picture in overall terms (cf. Mackie & Worth, 1991; 1989, for example) and mostly leave several alternative explanations open for interpreting the results (cf. Schwarz, Bless & Bohner, 1991; Bless, Mackie & Schwarz, 1992).

The same can also be said for the field of fear or induced fear with respect to the processing of persuasive messages. However, only a few studies on the processing of fear appeals have been carried out to date. There are both suggestions that high induced fear results in defence processes, and also studies which report the opposite. The question as to whether peripheral processing might involve motivational or capacity-related limitations as a result of fear appeals is not answered by the authors, but they do link their results to the curvilinear hypothesis postulated by Janis and McGuire.

In conclusion, it can be stated that the studies to date based on the ELM and HSM generally involve experimental designs with artificial examinations of real situations. Experimental testing with media in common use, and testing in experiments close to the field, must be undertaken as a matter of urgency so as to clarify the importance of the theories for the design of persuasive information. The work of Pointer and Rogers (1994) and Baron et al. (1994) offers the first starting points here for examining the models using problems relating to everyday life.

1 The first hypothesis, which draws on the mood of the receiver as a *peripheral characteristic* or as a *memory-supporting characteristic*, is based principally on assumptions from the field of learning theory. Studies of the *motivational effect* of mood on processing have proved (Hypothesis 2) that people in a negative mood tend to carry out complex, time-consuming and detailed processing. Conversely, people in a good mood tended to carry out heuristic processing (cf. Bless, 1989; Batra & Stayman, 1990, for example; for an overview, see Schwarz, 1988; 1990). A third hypothesis assumes that mood influences *processing capacity*. The basic assumption here is that mood-related cognition may interfere with the processing of the persuasive information.

2.3 Summary and Integration of the Models

The descriptions above make it clear that there is no one theory for estimating the effectiveness or mode of operation of fear appeals. Various approaches with different methodological strategies arrive at different results. The approaches presented above will be compared with one another below, since the initial apparent heterogeneity of the results can be attributed both to methodological differences and to differing research interests (in the sense of setting different focal points for considering one and the same process). The theories presented will be divided into three different approaches to this end, differing in essential aspects of research methodology and information interest. Figure 2.12 gives a comparison of the research strategies presented. This overview of the methodology is necessary for understanding the research findings, partly because the term fear represents different constructs in the individual research approaches. This must be borne in mind in the conclusions regarding the various investigation approaches, so as to ensure appropriate assessment of each theory.

Figure 2.12 distinguishes between independent variables (which were varied experimentally within the studies; e.g. the level of induced fear in Janis and Feshbach (1953)), dependent variables (the characteristics examined [e.g. behaviour, attitude], changes in which are the subject of the studies) and influencing or moderating variables (the mediating processes between the independent and dependent variables, which are not set in advance in the experiments, but recorded within the study).

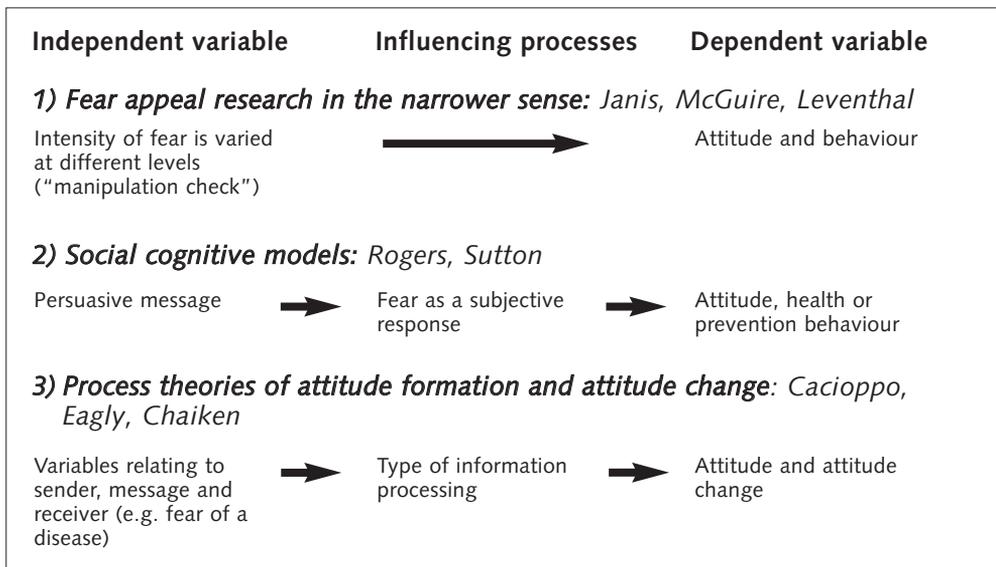


Fig. 2.12: Comparative presentation of the methodological approaches in the field of fear appeal research.

The fear appeal research in the narrower sense was primarily occupied with the question of “What effects do persuasive messages with various levels of fear induction have on attitude or behaviour?” Since it was established a priori which messages are considered as inducing particularly high levels of fear, only the efficacy of the fear appeals was recorded in the experimental procedure by means of a “manipulation check”, i.e. self-assessment of the emotional state of the test subjects. The theories regarding the curvilinear model (Janis & McGuire) and the dual process model by Leventhal can be regarded as the central theories of this tradition of research. Janis and McGuire worked from the basis that excessive fear induction triggers defence processes which lead to excessively high fear having little persuasive efficacy. Thus, the greatest effect on persuasion can be expected with moderate fear levels. Only two experiments have been able to prove this curvilinear hypothesis to date, meaning that the curvilinear hypothesis in its original formulation should be considered extremely critically, despite its plausibility. With its concepts of fear control and danger control, Leventhal's model offers an important addition to the above models. Fear control means the need of a person to control the emotional tension caused by the induced fear (by means of distraction, for example). Danger control, on the other hand, is intended to reduce the real risks (e.g. disease) by means of appropriate action. Fear-inducing preventive measures (e.g. screening examinations) initially conceal the risk of avoidance on the basis of this dual process model, since they are not accompanied by a reduction in fear. Conversely, a real change in health behaviour is probable because this results in a reduction in the induced (and subsequently cognitively represented) fear. The most important application-related result of the dual process model is that concrete instructions following the presentation of fear-generating contents are of major significance in terms of the implementation of the recommendations. Leventhal additionally assumed that the effect of fear appeals lasts for only a short period. In the use of fear appeals, this leads to the question of multiple reception of persuasive messages: if the efficacy of fear appeals lasts for only a short period of time, the question arises as to what happens in the event of regular confrontation. It is questionable whether an additive effect occurs or whether multiple confrontation with the fear-triggering situation tends rather to be accompanied by habituation and hence decreasing motivation to change. This question urgently requires empirical testing, since only the effect of a message has been investigated so far and effects over time resulting from multiple presentation have not been considered.

The designs of the studies based on the social cognitive models of health psychology pursue a different strategy, so the results must also be discussed against the background of this strategy. As was already made clear in the presentation of the protection motivation theory devised by Rogers, the primary aim of the theory was a more accurate description of the operative components of fear-arousing communications. To this end, the variables of severity of potential harm, vulnerability to a specific disease and coping possibilities to prevent the disease were varied systematically in the experiments. When considering the experimental procedure in the studies on the protection motivation theory, it is necessary to distinguish between studies with an experimental change in one of the areas

mentioned above and studies with no experimental manipulation (referred to as quasi-experimental studies). The former may contribute to answering the question regarding operative variables within persuasive messages. For example, the effect of different presentations of the severity of a disease can be tested in these studies and thus made available for the application of this theory in practice. Quasi-experimental studies compare an experimental group (who see a film on health-related topics) with a control group (who see a film on a subject of no relevance in the experiment). They do not allow conclusions of this type to be drawn. On the basis of these latter studies, the only possible conclusions are based on the reason for a change in protection motivation, with no possibility of drawing on factors intrinsic to the message as an explanation of this effect. A procedure of this type can be rated as descriptive, since testing the relationship between subjective experience and action or intended action is the point of emphasis. If only the first type of study is used to assess the efficacy of fear appeals, the following statements can be made on the basis of the protection motivation theory: the severity of the disease, i.e. the extent of the potential negative consequences of current behaviour, and the assessment of vulnerability, have effects on intended behaviour or behaviour in all the studies almost without exception. However, it must be emphasised that, while the common variance between the model variables and the attitude or behaviour is not random, it seldom exceeds the 30% mark. If quasi-experimental studies are added, it can be stated that the experience of fear is a relevant factor for initiating action and implementing preventive action. However, it is still not clear which design features of the message achieve this induced fear. In summary, the social cognitive models suggest a positive relationship between fear induction and the extent of attitude change, if possibilities for coping with the risk are offered simultaneously.

The process theories of attitude formation and attitude change have two important areas of application for the design of preventive communications. First, studies of this type provide important pointers for the design of persuasive messages and, second, these models involve a methodological procedure which can also be used in the evaluation or trial of preventive messages. The main concern of this line of research is to provide a picture of the process involved in processing persuasive messages. In this context, fear appeals are just one variable, which has so far been examined in only a few studies. One of the central results of the studies of the processing of persuasive messages is the motivational or capacity-related restriction of information uptake by high fear levels, which has been observed several times. This means that, in the case of messages which induce high levels of fear, the arguments presented are only of secondary importance, supporting the hypothesis that high fear induction results in more peripheral processing of information. These studies have backed up the curvilinear hypothesis. However, given the current state of research, it is not yet possible to talk in terms of definitive results, particularly as there is great latitude for the interpretation of the empirical findings and competing hypotheses are used to explain the findings. Furthermore, other authors report contradictory results in experiments on health-related topics based on the ELM or HSM, i.e. they show that information is processed centrally at high levels of fear. Since the overall importance

of emotions for information processing has not yet been clarified to any great extent, no definitive conclusions can be formulated on the basis of these models for the presentation of fear appeals in the context of preventive communications.



FINDINGS IN FEAR APPEAL RESEARCH FROM 1980 TO 1995



In this section, we shall present studies concerned with the effects of fear appeals on attitudes or behaviour. The studies date from 1980 to 1995 and are divided into experimental studies (*Section 3.1*) and field studies (*Section 3.2*). Selected papers have been integrated into the text, in smaller print, and allow the interested reader to obtain more details of the design, the aims and the results of the relevant study. However, the information in normal print is sufficient for a rapid overview of the individual areas of fear appeal research, so that the detailed description may be omitted if desired.

The studies were found using the PSYCLIT, PSYINDEX and CURRENT CONTENTS literature databases, the terms persuasive communication and fear appeal being used as keywords for the search. As a further important source of studies from the field of “grey” literature, we used contacts with colleagues dealing with similar objectives.

The experimental studies in *Section 3.1* have been broken down into studies in which the main characteristics studied related either to the message or the sender. These include, for example, the level of fear induced, the nature of the presentation, warnings as preventive messages, or the comparison of fear appeals with other appeals. The second part of this section considers receiver-related parameters and their interactions with fear appeals. The central factor here is the fear experienced after fear induction, and receiver variables, such as sociodemographic variables or the nature of prior behaviour (e.g. smokers versus non-smokers). The field studies in *Section 3.2* refer principally to work on evaluating warnings.

3.1 Experimental Studies

The term “experimental studies” means those studies in which individual variables were varied under controlled conditions in order to test their effects on the processing of persuasive communication. Fear appeals were regarded as independent variables in all the studies and tested in combination with other variables with respect to their effects on changes in attitude and behaviour. A distinction is made below between sender-related features (particularly features of the message) and characteristics of the receiver, which were examined in the experimental studies as additional independent variables. Level of fear, comparison of fear appeals with other presentation forms (e.g. humorous presentations), and the effectiveness of warnings, were all frequently investigated, sender-related features. Receiver variables described are the fear experienced, sociodemographic characteristics of the receivers of a message, and prior risk behaviour.

3.1.1 Sender Variables

Studies will be presented below under the heading “sender variables” in which features of the message were varied in order to test their effect on attitude change. These involve, in particular, studies in which the extent of induced fear was compared with the extent of attitudinal change. There are also a few studies which have dealt with a comparison of fear appeals and other appeals. A final section covers experimental studies of the mode of operation of warnings.

Level of induced fear

The intensity of the fear was varied in numerous studies and, since the study by Janis and Feshbach (1953) has formed the focus of much experimental work. In the studies presented below, materials which could be distinguished a priori with respect to fear level were given to the test subjects. The effects on the extent of attitudinal or behavioural change were attributed in these studies to the different experimental conditions (slightly versus highly fear-inducing messages).

First we shall look at studies in which a fairly pronounced attitude change or a more positive attitude was associated with fairly high levels of induced fear.

Gleicher and Petty (1992) observed a more positive attitude among students to a crime prevention programme if a moderate degree of fear was induced in the individuals (in contrast to a low degree).

Gleicher and Petty (1992) investigated the extent of attitude change in college students with respect to a “Crimewatch Programme” to prevent crime on the campus. This study was based on the elaboration likelihood model. The degree of fear generated varied between two conditions: in the “low fear” condition, the students were informed that only few students fell victim to crime and that these crimes did not have any serious consequences. In the “moderate fear” condition, the students were informed that crime was a frequent occurrence with serious consequences. The results in terms of the assessment of setting up a “Crimewatch Programme” were that people with moderate fear levels exhibited a significantly more positive attitude. Interaction effects were present which were interpreted on the basis of the ELM. In the experimental group with low fear induction, varying argument quality affected attitude, regardless of the anticipated efficacy of the countermeasures. With strong induced fear, the quality of the arguments had a significant effect on attitude in the group with unclear anticipated efficacy while, in the group with clear anticipated efficacy, both strong and weak arguments contributed to highly positive assessment of the measure. The authors conclude from these results that high induced fear and high anticipated efficacy tend to cause peripheral processing, which is demonstrated in this study by the absence of effect of the strength of the arguments. If, on the other hand, the efficacy of a coun-

termeasure is presented as unclear in a campaign following high-level fear induction, the arguments are very important (central processing).

In the study by Rogers (1985), primary effects could be seen on the intention to have a protective vaccination against an unknown virus. These effects were achieved by the variables of dangerousness of the virus, probability of infection and effectiveness of the protective vaccination against contracting the disease.

In the framework of his protection motivation theory, Rogers (1985) examined the effect of the variables, severity of a threat, probability of the occurrence of the event, and effectiveness of the countermeasure. Rogers also used these areas to define the term “fear appeals”. In this study, he had 89 students assess the extent of their intention to have a vaccination against a disease unknown in the USA (Asian virus) on a 15-point scale (high values correspond to a strong intention). All three independent variables showed significant primary effects. In addition, interaction effects were also seen (between effectiveness and severity, and between effectiveness and probability), although these explain only 5% of the variance.

Pointer and Rogers (1994) investigated the effect of fear induction on attitudes relating to excessive alcohol consumption or attitudes to the recommendation to drink less. A primary effect of the induced fear was seen (high fear was operationalised by the presentation of dramatic consequences of alcohol consumption) and an attitude change. In a similar study, Stainback and Rogers (1983) were able to show a significant effect of fear induction on attitudes to more moderate alcohol consumption. In another study, Maddux and Rogers (1983), showed that fear induction (operationalised by stating the probability of the occurrence of lung cancer as a result of smoking) had a significant effect on the intention to stop smoking. The study by Liberman and Chaiken (1992) yielded a primary effect of the induced fear of a fictitious disease caused by consuming too much coffee on the intention to drink less coffee. In the Wurtele and Maddux study (1987), the portrayal of the consequences and the probability of occurrence of cardiac infarction were varied experimentally. The respondents were asked to state their intention to take more physical exercise in future after having read the written information given to them in each case. Both the description of high vulnerability and the more extreme description of the consequences of cardiac infarction were accompanied by stronger intentions to take up sporting activities. Smith Klohn and Rogers (1991) wanted to test the relationship between the design features of a message and health-related attitudes in their study. To this end, they examined the intention in women to take calcium in the future and to engage in sports regularly in order to prevent osteoporosis. A dramatic portrayal of the visible consequences of osteoporosis proved to be a fundamental influencing variable on this intention, whereas proximity in terms of time or data on the frequency of the disease had no effect on attitude. In a similar study by Wurtele (1988), the portrayal of women as being highly vulnerable to developing osteoporosis proved to be a significant predictor for taking calcium. Similarly, Rippetoe and Rogers (1987) were able to show that after high-level fear induction relating to breast cancer, women reported significantly more coping strategies (in the sense of pre-

ventive strategies, i.e. screening examinations, etc.) which they would like to take up in the future. Tanner, Day and Crask (1989) dealt with AIDS prevention and the intention to use condoms in their study. If the brochure studied stated a high probability of HIV infection, the intention to use condoms was significantly more marked than in the group with a lower induced risk.

The studies below were able to show an opposite relationship between the level of fear induction and the extent of attitudinal change, i.e. attitudinal changes were less marked or the attitude tended to be negative with high induced fear.

The study by Kohn et al. (1982) was unable to prove any significant effect on the part of the fear level on current driving behaviour in car-drivers. Significant differences in attitudes to driving under the influence of alcohol could be seen only immediately after viewing three films with different degrees of fear induction. However, these were no longer present six months later. At the same time, this study showed a linear relationship between the induced fear level and the subsequent behaviour with respect to driving under the influence of alcohol. People with high levels of induced fear drove most frequently under the influence of alcohol six months after viewing the film, people with low induced fear did this least often. However, these differences were not significant.

Kohn, Goodstadt, Cook, Sheppard and Chan (1982) studied the influence of various levels of induced fear regarding accidents caused by drinking alcohol in 441 high-school students. The test subjects were shown three different films (based on the film entitled "Collision course" in each case) involving three stages of fear intensity. The film with low-level fear shows a person driving a car after drinking alcohol, and only just avoiding an accident. The person then says to himself that he will never again drive a car while drunk. The film with moderate fear induction showed an accident following alcohol consumption, in which the driver dies at the end of the film. The third film, with a high level of induced fear, corresponds largely to the film with moderate fear intensity, but the accident itself is also shown and made more dramatic by the use of sounds and visual effects. A significant increase in knowledge (regarding driving under the influence of alcohol) was seen in comparison with the control group in those people who had viewed one of the three films. This increased knowledge was independent of the level of induced fear and no stability over time was seen after six months, the result being that the test subjects were actually below their starting levels after six months. The effects on attitude were likewise not stable over time. For example, people who had seen a film with low or high induced fear levels exhibited significant changes immediately after viewing the film (which contradicted the theoretical predictions). No effects on attitude were present at moderate fear levels. As regards behaviour in the last six months, people drove less often under the influence of alcohol after low-level fear induction than after high-level fear induction. However, these differences were not significant.

The study by Hill (1988) tested the effect of induced fear, number of sex partners and dispositional fear of AIDS on the assessment of condoms using the dimensions of different rat-

ing scales. He found the most positive assessment of condoms with moderate fear appeals. The main problem of this study is the fact that neither attitudes nor behaviour were recorded. What was required instead was an estimation on emotional dimensions as dependent variables. An emotional assessment of a product is, however, difficult to isolate from the varying emotional design of advertising messages (particularly as regards fear appeals). At the same time, a negative emotional assessment is not a reliable indicator for the omission of a change in attitude or behaviour.

Hill (1988) tested the efficacy of fear appeals on attitudes to condoms. This study is based on the tradition of advertising psychology and examined the influence of induced fear, number of sex partners and fear of AIDS on attitudes to condoms. Attitudes to the advertising message (dimensions: good/bad, uninteresting/interesting, pleasant, etc.), and to the condom brand (dimensions: good/bad, positive/negative, important/unimportant) were surveyed as dependent variables. The authors did not test the extent of fear induced since they preferred to concentrate on fairly broad ecological validity. The results showed that very fearful people (with respect to AIDS) have a significantly more positive attitude to the advertising message. The differences between induced fear conditions were also significant: a moderate degree of induced fear yielded significantly more positive attitudes than the advertising text with greater or no induced fear. The effects on attitudes to different brands of condom were not, however, significant. The author concludes that appeals addressing the pleasure of the person concerned are inappropriate for the publicity material, as are appeals portraying the risks of AIDS in a dramatic fashion.

The studies below were unable to prove any relationship between the extent of induced fear and the degree of attitude change.

The study by Williams, Ward and Gray (1985) tested the effects of different levels of fear and the image communicated by the speaker (alcoholic versus non-alcoholic) on attitudes to alcohol. No primary effects of the induced fear on attitudes to alcohol were found. However, significant effects were found with respect to the ability to recall: messages from an alcoholic, and messages with low levels of induced fear could be recalled better one week after the presentation.

In 1977, Williams, Ward and Gray (1985) carried out a study with school pupils (N=103) with an average age of 13 years. The aim was to examine the effects of messages with high or low levels of induced fear, presented either by an alcoholic or a non-alcoholic. The effects were investigated immediately after the presentation and one week later. The test subjects were found to be better able to recall the message from the alcoholic. The same applies to the test condition with low induced fear. No effects on attitudes to alcohol could be observed.

Baron, Logan, Lilly, Inman and Brennan (1994) studied the influence of fear on attitudes to fluoridation of the groundwater as a measure for the prevention of tooth decay. No primary effect of the induced fear on attitudinal change was found, i.e. the group with high-level fear induction did not have a more positive attitude. Schützenhöfer and Knoch (1991)

examined the effect of aversive content in road safety advertisements on driving behaviour and on attitudes to wearing a seat belt and other variables of relevance to safety (cf. also Roth, Derler & Schützenhöfer, 1990). The level of fear was varied by portraying the consequences of an accident with varying degrees of drama, but no uniform trend was found with respect to the effect of the level of fear on traffic-related attitudes.

Schützenhöfer and Knoch (1991) investigated the effect of aversive content in road safety advertising. The authors showed their test subjects (93 men and 93 women aged between 18 and 24 years) series of slides on the prevention of car accidents, with differences in the fear arousal dimension (low versus moderate versus high fear levels) and text content (general/emotional versus informative versus family appeal). Heart rate on viewing the slides was recorded as a physiological variable, as well as numerous other variables. The authors reported no primary effects on driving behaviour or attitude to wearing a seat belt. The poor description in overall terms mean that it was only possible to understand these descriptive results.

No primary effect of the induced fear on the intention not to smoke in future could be seen in the study by Sturges and Rogers (1994). The test subjects in this study were children, young people and young adults who had not yet smoked. Struckman-Johnson et al. (1990) investigated the efficacy of fear appeals on potential condom-purchasing behaviour. The authors were unable to find any significant effect on purchasing decisions caused by slogans designed to induce high-level fear.

Struckman-Johnson, Gilliland, Struckman-Johnson and North (1990) studied the efficacy of various AIDS prevention slogans. In a study with 191 male and female students, they examined the influence of fear level (high versus low fear induction by the slogans), fear of AIDS (high versus low fear of AIDS) and gender on potential willingness to purchase the condoms offered. No significant primary effect of the fear level on purchasing behaviour was found. On the other hand, the primary effects of the “fear of AIDS” and “gender” variables were significant (people with a high fear of AIDS and men reported increased purchasing behaviour). Gender-specific predictors were evident in the regression analysis (regarding the potential purchasing decision) carried out afterwards. In men, the slightly “offensive” presentation (rating by the test subject) and the extent of sexual stimulation in the presentation were the best predictors. In women, the best predictor was assessing the product as pleasant (rating: “It provides pleasure”).

Studies are described below by way of example, where the effect on intention or behaviour after a film generating fear was investigated in comparison with a control group (without this film). The studies by Sutton's working group can be cited as examples in this context.

Sutton and Hallett (1989a) were unable to prove any direct significant effect of viewing a film about the risks of smoking on the intention to stop smoking. The control group watched a film about the risks of driving a car without a seat belt. In statistical terms, the change in the intention to stop smoking in the experimental group could not be differentiated (cf. also Sutton & Hallett, 1988; Sutton & Eiser, 1984).

Sutton and Eiser (1984) studied the effect of the film “Dying for a fag” (portraying the risks of smoking) on 138 office-workers who were shown either the experimental film or a control film on alcoholism. The test subjects attended the study voluntarily and must therefore be classed as highly motivated. In a second study, a film about the risks of driving a car without a seat belt (“Collision course”) was shown as the control film. A quarter of the participants were classed as smokers. The measures of concern (utility), the extent of reduction in the probability of developing lung cancer (probability difference), and the estimated probability of being able to stop smoking in the future (confidence) were recorded for the prediction model of a change in intention and smoking behaviour (the criterion being an attempt to stop smoking). The fear experienced on viewing the film was considered as an independent variable of the model. The results showed significant correlations between viewing the film, utility, experienced fear, intention and behaviour. On the other hand, the correlations between viewing the film and confidence in being able to stop smoking, and also regarding the estimated reduction in the risk of developing lung cancer were not significant. Nor were the correlations between the model variables and the experienced fear significant. The experienced fear itself was the variable which correlated to the second-highest extent with intention and behaviour. Only the intention reported after the study had a greater influence on behaviour.

On the basis of the model by Sutton and Eiser (1984), Sutton and Hallett (1988) tested the efficacy of fear appeals on smoking behaviour. The test subjects were shown either the film “Dying for a fag” or a film about using a seat belt. The test subjects were then asked about the fear perceived on watching the film. The participants were also given a brochure on ways of stopping smoking. The intention to give up smoking (rating immediately after viewing the film) and the attempt, within the three-month period following the experiment, to give up smoking (yes versus no) were measured as dependent variables. The test subjects were office-workers with a mean age of 40 years who smoked an average of 17 cigarettes per day. There was no significant direct link between viewing the film and the intention. Viewing the film had a significant influence on the estimated decrease in the probability of developing lung cancer, and on the threat experienced. These two variables, in turn, had a significant influence on the intention. After three months, 42% of the experimental group reported having made an attempt to stop smoking. This proportion was only 22% in the control group. The behavioural intention was the only predictor to have a significant effect on realisation of the behaviour. The experienced fear had no significant influence on the behavioural intention or behaviour in the three months following the experiment.

In a similar study by Sutton and Eiser (1990), in which the design described above was reversed, intention to wear a seat belt was used as the criterion. The authors were able to prove a significant effect of viewing the film on the intention to wear a seat belt (cf. also Sutton & Hallett, 1989b). In overall terms, the results are non-uniform. However, the vast majority of the investigations reported no negative effects of a fear-inducing film on the intention to implement preventive behaviour, i.e. there is either no effect or a positive effect on attitude after viewing a film of this type.

In this study, Sutton and Eiser (1990) again work from an expectancy-value approach. The participants in the experimental group in this study watched a film on road safety, while the control group watched the film “Dying for a fag” which was already familiar from other studies (cf. Sutton & Hallett, 1988). The test subjects were asked to give ratings in the following areas: fear on viewing the film, probability of an accident occurring, probability difference on wearing as against not wearing a seat belt, and experienced threat. 157 office-workers from a London-based transport company were used as the survey sample, the films being shown to groups of between 20 and 30 people at a time. Viewing the film had no direct significant effects on the model variables. The effect on the intention to wear a seat belt was significant, on the other hand, although no significant effect on behaviour could be detected three months later. The perceived fear on viewing the film correlated significantly with the estimated probability difference. Fear also correlated significantly with intention, but not with behaviour. Over a period of one year, only behaviour three months after viewing the film exhibited a significant correlation.

Fear appeals in comparison with other appeals

A number of studies have attempted to test the effectiveness of fear appeals in comparison with other “appeals”. Two or three other comparison groups were usually used for this purpose, in which, for example, humorous, erotic messages, or the like, were linked to a call to change attitudes or behaviour.

The study by Robberson and Rogers (1988) was able to demonstrate that, in addition to fear appeals, appeals to a person’s self-esteem and self-confidence may lead to changes in attitude regarding sporting activities. However, these two forms of appeal have been shown to differ in their effectiveness, depending on whether they were formulated positively (“Sport is good for your health or for your self-confidence”) or negatively (“If you do no sports, it is bad for your health or for your self-confidence”). The most effective versions proved to be a negative appeal to health (“Not playing sport is bad for your health”) and a positive appeal to self-confidence (“Sport is good for your self-confidence”). The authors concluded from this that appeals to both areas, with different valences, are justified in campaigns.

The study by Robberson and Rogers (1988) compared the efficacy of fear appeals and the effectiveness of messages appealing to the positive consequences of a behaviour. In addition, they varied the appeal, using firstly an appeal to health (“One of the greatest advantages of becoming involved in a regular exercise program is the resulting increase in physical stamina and endurance.”) and, secondly, an appeal to self-esteem (“And what better results of exercise and fitness can there be than that general ‘feeling good about yourself’ that goes along with the improved appearance, personal style, confidence, and control. There’s a boost to self-esteem that gives you greater comfort with yourself so that your pride and self-acceptance grow.”). The credibility of the message, the assessment of model variables from the protection motivation theory (severity, vulnerability), the effectiveness of the measure (sport) in terms of health (“response

efficacy-health”) and self-esteem (“response efficacy-self-esteem”) were recorded as dependent variables, as well as an assessment of expected self-efficacy (“self-efficacy”). The most important dependent variable was the intention to commence sporting activity. Female students who had described themselves as inactive in terms of sport (i.e. less than four weekly periods of physical exercise lasting 45 minutes) served as the sample. The results show that credibility did not vary significantly between the four conditions. Nor did the other control variables show any fundamental differences between the four groups. No primary effects of the experimental conditions on behavioural intention were seen. However, significant interaction effects were found: the positive self-esteem message generated a significantly greater behavioural intention than the negative self-esteem message. In contrast, with the health-related message, significantly greater behavioural intention was observed for a negative formulation.

Struckman-Johnson, Struckman-Johnson, Gilliland and Ausman (1994) examined the efficacy of fear appeals in comparison with erotic, humorous and factual presentations. The messages were used in TV spots for AIDS prevention and tested with respect to the criteria of attitude and behaviour. The fear-related appeals were more effective with respect to the intention to protect oneself against AIDS in future by using condoms with an unknown partner or with a current partner. In terms of intention, a gender-specific effect was seen. Women reported a greater intention than men after viewing the spots. This result contradicts a study by the same working group (cf. Struckman-Johnson, Gilliland, Struckman-Johnson & North, 1990), in which men showed a more positive assessment of slogans for AIDS prevention. The results at the behavioural level (taking condoms which were available free of charge) could not be used for methodological reasons, since the test subjects each tended to select four condoms, one in each of the four different colours.

Struckman-Johnson, Struckman-Johnson, Gilliland and Ausman (1994) studied the effect of different forms of appeals (in TV spots) on attitude and behaviour regarding protecting oneself against AIDS. They used the following messages as appeals: fear appeals without a sexual theme, fear appeals with a sexual theme, a factual report, a humorous presentation, and an erotic presentation. They worked from three hypotheses:

- 1) Fear appeals are more effective than the other three forms of message;
- 2) Fear appeals with a sexual theme are more effective than those without a sexual portrayal, and
- 3) Men can be influenced by the messages to a greater extent than women.

53 men and 74 women were used as test subjects for the preliminary study (to select the slogans). The main study involved 236 people of both sexes with an average age of 20 years. The “AIDS-worry” scale was used as a measure of the effect (this measures concern about getting AIDS), together with attitude regarding condoms and ideas relating to sexuality and partnership. The subjects were also asked about their intention to use condoms in contact with a permanent partner or a new partner. Behaviour was measured by allowing the study participants to take condoms away free of charge and counting the number taken. The results showed that fear could

indeed be generated by the different messages under the first two experimental conditions. At the same time, the erotic portrayal was classed as being significantly more romantic. The effects on the intention to use condoms exhibited a primary effect suggesting that fear appeals prove to be significantly more effective than erotic, humorous and factual portrayals (this applies to the intention with respect to a current partner and also with respect to a new partner). A gender-specific effect was also evident: women report a greater intention than men to use condoms. The validity of the behavioural measure is restricted by the fact that a large number of test subjects took four condoms (each of a different colour). Only the result that men took more condoms than women is worth mentioning.

The study by Brooker (1981) also investigated the differential efficacy of fear appeals in comparison with humorous advertising slogans on dental hygiene. This study from the field of advertising efficacy research used purchasing behaviour (toothpaste in this case) and attitude to the product as criteria. Humorous slogans were found to be at an advantage with respect to purchasing behaviour, i.e. humorous slogans resulted in a better assessment of the brand and potentially greater purchasing behaviour. These differences were particularly clear in people of a higher educational class.

Knapp (1991) studied the effects of health-related appeals (positive consequences for health are presented against negative consequences for health) and “environment-related” appeals (positive social consequences are presented against negative social consequence) in ten-year-old children. The subject of the investigation was tooth-brushing behaviour, which was recorded at several measurement points. The portrayal of the negative social consequences of prophylactic dental care proved to be superior with respect to the extent of plaque. No significant differences were found between the experimental groups in terms of self-reported tooth-brushing behaviour and behavioural intention.

Nature of presentation of fear appeals

Sherer and Rogers (1984) attempted to investigate the additive effect of different presentations of fear appeals on behavioural intention. In their study, they developed messages which differed in the dimensions of emotional interest (corresponding to the similarity between the test subject and the person described in the text), concrete nature of the presentation and topicality of the message. A high degree of similarity between the sender and the receiver yielded a stronger intention to practise controlled alcohol consumption. There was also a significant correlation between estimated harmfulness and the concrete nature of the presentation. Another effect investigated was the capacity to recall the content of the message. There was better recall of a concrete presentation (the content of the message was remembered better if, for example, individual people were presented and no statistics were given).

Sherer and Rogers (1984) studied moderator effects with respect to the “vividness” of information. Written information material (about 4,000 words in length) on the subject of “problem

drinkers” was used as the messages and given to 80 student test subjects. Four areas were emphasised and served as criteria of a message relevant to the receiver: high versus low emotional interest (problem drinkers were portrayed as similar or dissimilar to the reader); high versus low concrete nature (presentation of individual cases versus presentation of statistics); greater temporal proximity versus less temporal proximity (the study was completed one month previously versus the study was about ten years old). In addition to measuring the three dimensions listed above, the intention to limit alcohol consumption (immediately after the presentation and 48 hours later) also had to be stated. The results showed that the change was successful in all three dimensions and could be illustrated using scales. The only primary effect found on the immediate intention to drink alcohol was the influence of emotional interest. The message in which the person described was portrayed as similar, had a greater influence on the intention. The interaction effects are difficult to interpret and have been omitted for ease of understanding. A significant correlation was found between the concrete nature of the presentation and the estimated risk. One further result also appears of importance: recall was significantly better with a concrete presentation than with a less concrete presentation using statistics.

In a study on defence processes at high fear levels, it was postulated that a dogmatic call to abstain from alcohol generates reactance¹. Southwick-Bensley and Wu (1991) were able to show that men, in particular, respond to a dogmatic appeal to restrict the consumption of alcohol with reactance and exhibit stronger intentions to drink and increased drinking. Gender-specific effects were also seen in light and moderate drinkers. Whereas women reacted to a call for abstinence with a lower intention to drink, men exhibited a greater intention to drink after the appeal for abstinence. Among moderate to heavy drinkers, men proved to be the group with the greatest reactance and the highest alcohol consumption following a dogmatic call to restrict alcohol consumption.

Southwick-Bensley and Wu (1991) studied the importance of reactance following a prevention message calling for controlled alcohol consumption or abstinence. Two studies by this working group will be presented below.

In *the first study*, 535 male and female students aged between 15 and 50 years were subdivided according to their drinking habits into non-drinkers (96 people), occasional drinkers (126 people), light to moderate drinkers (223 people) and frequent drinkers (90 people). The persuasive messages were varied in terms of the proposed objective of abstinence or controlled drinking, and these were described as dogmatic or less dogmatic objectives, respectively. Estimated future drinking behaviour (behavioural intention) for three dates (within the next few hours or days and in overall terms in the future) was surveyed as a dependent variable. The results relating to assessment of the messages in terms of pleasant, personal agreement, etc. are not given here for the sake of greater ease of presentation. Only effects on action-related intentions are reported below. In this context, it became evident that the quantity drunk prior to the experiment has a

¹ The concept of reactance will not be described in more detail here. Reactance is defined as a counter-reaction to an appeal by another party to make a change in attitude or behaviour. Reactance is connected to the experienced restriction of freedom by the external appeals.

primary effect on future intention. The examination of the dogmatism variable yielded a significant effect in the expected direction: readers of the dogmatic message reported greater intentions to drink, confirming the hypothesis of reactance.

The *second study* attempted to transfer the results obtained to concrete behaviour (beer consumption in this case). Here, again, the dogmatic part of the message was varied systematically. Only moderate to heavy drinkers of both genders were used in this study (N=74). The test subjects were told that they were taking part in a taste test for beer. The quantity drunk was the central dependent variable and is given primary consideration below in the presentation of the results. Women exhibited lower consumption after the dogmatic call to restrict beer consumption, while men drank more after a dogmatic appeal. This result arises principally because male heavy drinkers drank significantly more than any other group after a dogmatic appeal.

Krishnamurthy (1986) studied the effect of messages on the risks of smoking as a function of the type of presentation (written versus verbal). To this end, 200 male students aged between 20 and 26 years were divided into four groups with different test conditions: Group 1 was given a verbal form, Group 2 a written form, Group 3 was given the text in both written and verbal form, and Group 4 served as a control group. The most marked form of emotional reactions (rating) was seen in Group 3. This result is also confirmed on consideration of the change in intention, since the greatest changes were found in Group 3. This applies to both smokers and non-smokers. However, the presentation of this study is extremely unsatisfactory and, in addition, the effects are of dubious quality because of the low cell frequency.

Warnings

The studies described below investigated the effectiveness of warnings under experimental conditions. The results of field studies on the efficacy of warnings can be found in *Section 3.2* (cf. also Barth & Bengel, 1997).

In the study by Ho (1992), Rogers' protection motivation theory (cf. *Section 2.2.4*) was used to examine the effectiveness of four warnings. The aim was to test the influence of the warnings on the desire to stop smoking. The warning about lung cancer had the greatest influence, and the warning about loss of physical fitness the lowest influence. The interaction effects and the concluding path analysis model will not be discussed here. In his conclusions, Ho stresses the importance of induced fear for behavioural change, since he regards this as the motivating agent, He believes that expected self-efficacy alone cannot lead to a change in behaviour.

Malouff, Schutte, Frohardt, Deming and Mantelli (1993) carried out four studies with young people, examining understanding, recall and attitude to warnings about the risks of smoking. This study yielded the result that warnings pointing out health risks and risks

during pregnancy are more effective than the note that there is a lower probability of developing lung cancer after stopping smoking, or the note about carbon monoxide in cigarette smoke. The former messages were remembered better and were assessed by school pupils as more effective than the latter messages.

In a similar study, Beltramini (1988) investigated the subjective credibility of warnings on cigarette packets. While the general note regarding possible health risks caused by smoking was classed as highly credible, and statements regarding concrete health damage (such as lung cancer, heart attack, prenatal damage to the child) were also evaluated as extremely credible, the statements “Quitting Smoking Now Greatly Reduces Serious Risks to Your Health” or “Cigarette Smoke Contains Carbon Monoxide” were reported as being significantly less credible.

The study by Barlow and Wogalter (1993) examined the memorability and reproducibility of warnings presented using visual and auditory methods. An audiovisual presentation was found to be clearly superior to a presentation restricted to only one sensory route. The authors were able to formulate less clear-cut findings for the visual design of warnings in magazines. For example, it was not possible to use a conspicuous presentation (using a warning triangle with an exclamation mark as a logo) to generate increased attentiveness which would also be reflected in the reproduction of the warnings. However the size of the warning was of significance for recall of the warnings given.

Loken and Howard-Pitney (1988) investigated the effects of warnings on the health risks of smoking. The authors were able to show that warnings presented simultaneously with a young, attractive model were less credible than a simple presentation with a cigarette packet. Since they asked both female smokers and female non-smokers, differences were found in both groups. Female smokers assessed the persuasiveness of the warnings as high, but could remember fewer warnings. The (female) authors believe that the presentation of attractive people in television advertising is partly responsible for the credibility of warnings being underestimated.

Loken and Howard-Pitney (1988) studied the efficacy of warnings regarding the health risks of smoking. 27 of the total of 115 test subjects, all of whom were female, were smokers. The two authors used experimental variation of the type of warning (general government warning versus newly formulated warnings) and of the type of presentation (warning with attractive woman versus warning with cigarette packet) among other things. As dependent variables, they examined attitudes to each slide using a semantic differential (attractiveness, persuasive effect, credibility). The test subjects also had to remember as many warnings as possible, so as to test the memorable nature of the warnings. Warnings with a female model were rated as significantly more attractive and less credible. The general warning was classed as more persuasive. Female smokers assessed the persuasive power as significantly stronger than female non-smokers. A clear (albeit not significant) difference was found between female smokers and female non-smokers with respect to the capacity for recall. Female non-smokers were better able to recall

warnings previously seen. The more detailed analyses did not yield any results of relevance for this paper.

The studies by MacKinnon (cf. MacKinnon, 1993; MacKinnon, Nemeroff & Nohre, 1994) used a design in which the effect of various messages on alcoholic drinks was compared. The method of comparison was for the test subjects to imagine different scenarios in which they had the opportunity of choosing between two drinks (e.g. at a party, at the supermarket). One of the drinks in each case bears a warning label, while the other drink has no such label. MacKinnon used this method to examine the extent to which the test subjects could have their potential choice influenced, even though they knew that the content of the drinks was identical in each case. Warning labels saying “poison”, “poisonous” and “carcinogenic” had a greater deterrent effect than the prescribed government warning regarding the risks of alcohol consumption (MacKinnon, 1993). The study by MacKinnon, Nemeroff and Nohre (1994) was additionally able to show that the formulation “Alcohol may cause health problems” is far less effective than the formulation “Alcohol causes health problems”.

MacKinnon, Nemeroff and Nohre (1994) studied the efficacy of warnings on alcoholic beverages. The 292 student test subjects were asked whether they would rather buy alcohol with the imprint which has been prescribed since 1989 (or with an alternative imprint) or without this labelling. It was found that, in particular, bottles with the imprints “causes health problems”, “is poisonous”, and “causes cancer” were chosen less often. At the same time, no effect was found for the imprint in current use. Overall, a large percentage of people (approx. 50%) were unimpressed by any of the warnings (apart from poison, carcinogenic). These results were replicated in a second study in which the test subjects were younger school pupils with a greater probability that they did not yet drink alcohol (approx. 50%).

Popper and Murray (1989) studied the influence of the size and type of presentation of warnings on legibility, understanding and memorable nature in over 200 test subjects. The test subjects were presented with a large number of advertising pages from a sports magazine, one of these advertising pages containing the warning being investigated. The size (10 pt versus 14 pt print) and contrast (black text on white background = high contrast versus white text on grey background = low contrast) of the warning were varied. Only a quarter of all the test subjects were able to remember the warning and reproduce it from memory. No significant individual effects of the different experimental conditions could be found. At most, it can be said that the trend was for the size of a warning to be less important in terms of its memorable nature and reproducibility than a high-contrast presentation.

3.1.2 Receiver Variables

Receiver characteristics have to date been less often investigated than the features of the message itself, as listed above. Only the area of experienced fear has been well studied. The studies presented below differ from the studies mentioned above in the section “Fear level” in terms of their experimental procedure. Whereas, in the section above, it was principally group comparisons which were undertaken (high fear induction versus low fear induction), in the studies below, it is the experienced fear which is surveyed and serves as the independent variable. Sociodemographic variables and risk behaviour of the receivers are also included as additional characteristics relating to the person.

Experienced fear

In many studies, the experienced fear is used as a predictor for an attitude or behaviour. The findings listed in *Section 2.2.4* regarding the protection motivation theory devised by Rogers can also be mentioned here, as can the numerous papers by the group working with Sutton. Many authors come to the common conclusion that the experience of fear of a disease has a significant effect on a change in attitude or behaviour (cf. summarising presentations by Sutton & Hallett, 1989a, 1989b; Rogers & Prentice-Dunn, 1997). At the same time, the authors reach the opinion that the message should also offer opportunities for coping with a health risk. The group with high fear and an effective coping strategy underwent the greatest attitude change in many studies.

Sociodemographic variables

In a study on the comparative efficacy of humorous appeals versus fear-inducing messages in advertising dental hygiene products, Brooker (1981) was able to show that more highly educated people reacted differently to the two forms of appeal, while people with lower educational levels exhibited no differences. He therefore reached the conclusion that fear arousal messages are unsuitable, in particular, for people with a higher standard of education.

Brooker (1981) compared the efficacy of fear appeals with that of humorous appeals. The test subjects (N=240) in this study had to assess advertising slogans for toothbrushes or against plaque with respect to the following dimensions: “I need the product”, “Quality of the product”, “I like the product”, “Attitude toward the company”, “Probability of buying or using the product” and “Probability of buying other products of the same company”. The evaluation of the results of the test subject survey yielded significant advantages for the humorous slogans with respect to potential purchasing behaviour and attitude to the company. The assessments of the need to purchase this product, the quality of the article and preference for this product,

yielded no significant differences. Comparison with factual information on dental care did not yield any significant differences from the humorous advertising slogans, but significant differences from the fear-inducing advertising slogans were found. The educational level of the test subjects was used as the control variable. The results suggest that fear appeals result in negative effects in more highly educated people and have a negative effect on purchasing decisions.

Risk behaviour of the receivers

The study by Watson, Pettingale and Goldstein (1983) investigated the differential effect of an anti-smoking film on physiological measurements in, and subjective statements by, female smokers and non-smokers. The authors were able to show that female smokers have a greater increase in heart-rate and report greater tension and anxiety than female non-smokers on viewing this film. The authors conclude that the induction of anxiety by fear-inducing films is successful and that behavioural changes can therefore be anticipated.

Watson, Pettingale and Goldstein (1983) also investigated the effect of the film “Dying for a fag” (cf. Sutton & Hallett, 1984) from the aspects of previous risk behaviour (smokers versus non-smokers), physiologically measured and subjectively reported fear (*State Trait Anxiety Inventory*, STAI) and a third-party rating of displayed emotion (anxious versus relaxed). Twenty women working in a hospital served as the test subjects. They were assigned to a smoker group (N=10) or a non-smoker group (N=10) on the basis of the criterion of smoking more than five cigarettes per day or not. In the smokers, viewing the film resulted in a significant increase in heart-rate, which was not found in the non-smoker group. The self-reported data suggest that smokers were more anxious than non-smokers, both before and after watching the film. Significant differences were found between the two groups after viewing the film, with respect to the assessment of agitation and tension. None of the other items yielded significant differences. There were no major differences in terms of content in the behavioural measures on viewing the film. Finally, numerous correlations were reported between the individual scales, but these are difficult to interpret because of the fact that the sample was no longer separated (into smokers and non-smokers) and are therefore not very useful.

3

3.2 Field Studies

The studies presented in this section were not carried out in an experimental framework, but tested the effects of fear appeals using a naturalistic design. The section starts with studies which investigated the efficacy of warnings regarding the risks of alcohol consumption and the risks of smoking. The majority of these studies were carried out in the USA.

Field studies on warnings

Since 1989, it has been mandatory in the USA to print warnings about the harmful consequences of alcohol consumption on alcohol beverages.² The wording of these warnings is as follows: “GOVERNMENT WARNING: (1) According to the Surgeon General, women should not drink alcoholic beverages during pregnancy because of the risk of birth defects. (2) Consumption of alcoholic beverages impairs your ability to drive a car or operate machinery and may cause health problems.” Many evaluation studies have attempted to investigate the efficacy of these warnings in field studies (cf. the review by Andrews, 1995).

MacKinnon and Fenaughty (1993) tested the extent to which smoking or consuming alcoholic drinks was accompanied by increased perception of the warnings. They worked from the assumption that smokers and people drinking alcohol will be significantly better able to recall warnings on cigarettes or alcoholic drinks. This hypothesis was confirmed: there was a significant correlation between the amount consumed and the capacity for recognition.

Kaskutas and Graves (1994) studied the perception and effect of the warning regarding the harmful consequences of alcohol consumption during pregnancy. They distinguished between three groups of people as regards the intensity of perception of the warnings. The criteria used were perception of a warning label, a poster and an advertising spot regarding drinking during pregnancy, which had been published immediately prior to the study. The existence of these three criteria yielded a point score between 0 (no perception) and 3 (all media perceived). A telephone survey was selected as the survey method and succeeded in reaching more than 4,000 people. The results showed that the following groups of people tended to have seen several sources of information: men, people aged under 40 years, people with higher levels of education, and people with excessive alcohol consumption (cf. also Kaskutas & Greenfield, 1992). Income and ethnicity had no significant influence. After excluding people who described themselves as abstainers, the relationships between the sociodemographic variables and the areas “knowledge of the risks of alcohol consumption”,

² A similar ordinance for cigarettes came into force in the Federal Republic of Germany with effect from 31 December 1991. The working group has no assessments of the effectiveness of this ordinance at its disposal, so conclusions can only be drawn from American studies on warnings on alcoholic drinks.

“contents of the campaign as part of everyday conversation” and “the reduction of alcohol consumption on health grounds” were analysed. Only a few of the individual comparisons will be presented which had a fundamental influence throughout on all three areas. Thus, younger people could be influenced to a significantly greater degree, both with respect to the increase in knowledge, the extent of everyday conversation on this topic, and the reduction in drinking. Furthermore, people who had perceived at least two forms of the presentation also exhibited more positive results on all three levels than people who had perceived none of the three possible media. Effects on the extent of everyday conversation on this topic were seen in women of childbearing age. As soon as these women had perceived one of the possible messages, they would more often communicate about the damage caused by alcohol consumption during pregnancy. However, as regards reduction of the amount drunk, only women who had perceived all three media differed from women who were unable to name any of the three sources. Actual pregnancy had no effect on perception of the messages, since only one-third of both pregnant and non-pregnant women had seen two or more messages. However, the drinking behaviour of the two groups and their everyday conversation did differ. Pregnant women discussed the content of the campaign more often and had restricted their drinking habits to a greater extent.

Another study by this research group was concerned with a comparison of people living in Canada, where there is no ordinance of this kind, with people in the USA, who have been confronted with this type of warning since 1989 (cf. Greenfield, Graves & Kaskutas, 1993). In terms of knowledge of the health risks of alcohol, the two samples differed only in their assessment of the consequences of alcohol consumption during pregnancy. People in the USA assessed this risk substantially higher than people from Canada. However, this difference was also present prior to implementation of the new legal ordinance. Other effects on knowledge and on the attitude to alcohol could not be detected in this study either.

In the studies by Hankin et al. (cf. Hankin et al. 1993a, 1993b), pregnant women from the lower class of African origin who attended a preliminary examination at a clinic were surveyed. The principal interest of the investigators was to ask whether the women had read a warning about the damaging results of alcohol consumption during pregnancy. Over 40% of the women stated that they had already read messages of this type before the law came into force, and thus prior to the actual existence of these warnings. Not until some five to seven months after the start of the actual campaign can an intervention effect be seen extending beyond the false-positive response effect of these women, so that an increase of 25% could be found after 20 months.

In the study by MacKinnon, Pentz and Stacy (1993), the effects of the alcohol warnings were tested in the target group of young people. The authors expected a major change with respect to perception of the warnings, a minor change in knowledge of the risks of alcohol consumption and an even smaller change in behaviour. A before/after measurement method was used, with different people being questioned. In a similar fashion to the findings in the study by Hankin et al. (1993a, 1993b), 20% of the respondents reported already

having read a warning of this type, although no such warnings existed. The following year, 43% of those asked reported having read one. With respect to the assessment of the harmful consequences of alcohol consumption and of drinking behaviour, there were no significant changes in the one-year period. Of the health risks stated in the warnings, the school pupils surveyed most often remembered congenital damage (83%) and least often the impairment when operating machinery (56%).

The effects of the statutory ordinance on the labelling of alcoholic drinks were investigated again in the study by Mazis, Morris and Swasy (1991). This study involved a before/after design, the first measurement point being six months prior to the ordinance coming into force and the second measurement being made six months after the ordinance. More than 1,000 people were surveyed by telephone. The people surveyed had to assess the risks of alcoholic drinks, tobacco, artificial sweeteners, etc. A significant change could be found only in the risk perception of alcohol on comparison of the two measurements. The whole sample was then divided on the basis of sociodemographic characteristics and current drinking behaviour. Significant changes in risk assessment (in the desired direction) were found among younger people, more educated people and people with higher incomes. Major changes in risk assessment were also seen in people who drank fairly frequently, while people with low alcohol consumption exhibited no change. People who had perceived the warnings were asked about the information they contained. Younger people, as well as more educated people and those with higher incomes, were better able to give this information. But people drinking a fairly large amount of alcohol were also better able to repeat the warnings. The authors conclude that the ordinance relating to the application of warnings to alcoholic drinks has been able to change risk perception in sub-groups of the population. Younger people and people with high alcohol consumption exhibited a change in knowledge of the potential risks of alcohol consumption.

Other field studies

Rosser (1991) conducted a comparative study of Australian and New Zealand education campaigns and reached the conclusion that excessive induction of fear in education campaigns may lead to a fatalistic attitude which, in turn, has negative effects on self-protection motivation. His study on HIV protection behaviour among homosexual men following a campaign (with high levels of fear induction) showed an increase in men not protecting themselves. However, because of the small sample size ($N=73$), this study must be regarded as being methodologically extremely unsatisfactory for the evaluation of a campaign organised on such a large scale. The result must also be interpreted with caution because of the self-selection of the survey participants, even though the reduction of about 50% in people protecting themselves must be rated as impressive.

Rosser (1991) evaluated two different education campaigns (on the subject of HIV infection in homosexual men) from the perspective of the efficacy of fear appeals. The comparison of an ed-

ucation campaign in New Zealand (low induced fear) with a campaign in Australia (high induced fear) was made using behavioural criteria (e.g. unprotected anal sex). The results showed that the number of men using protection increased in New Zealand over a six-month period (the campaign used there was not explicitly stated), while in Australia, a decrease to about half the initial value was seen in the number of men using protection. A critical factor in this study is the small sample size of 73 people (in Australia) and the voluntary participation of the respondents.

Weinstein, Sandman and Roberts (1991) investigated the willingness of inhabitants of a region with a high radon concentration to conduct a test to check the concentration in their homes. The authors were unable to detect any additive effect of a message describing the risks of high radon concentrations for the respiratory organs. A relatively brief piece of factual information fulfilled the same purpose in this case. Assessment of the risk, and assessment of the severity of the health damage to be expected, proved to be good predictors for the implementation of a radon test (cf. also Weinstein & Sandman, 1992).

Weinstein, Sandman and Roberts (1991) studied the efficacy of a campaign for home radon testing. They differentiated between two experimental conditions: in the experimental group, the test subjects were informed that they lived in a high-risk area and it would therefore be sensible to test the radon concentration. The control group was given the message that it would be a good idea to test the radon levels in the air (without any urgency being suggested). Almost 5,000 people from the New Jersey region were used as test subjects, only 647 of whom remained as a result of the returns of the preliminary test (and exclusion of people outside high-risk zones). The average age of the subjects was 49 years and they had lived in this area for over 14 years on average. The results showed that the risk assessment by the experimental group was significantly altered by the intervention. For example, the people in the experimental group assessed both their own risk and the risk for people in their region as higher after the intervention than beforehand. The study participants were able to order a device to test radon levels and this acted as a criterion for behavioural change. The experimental condition exhibited no influence on willingness to order one of these devices. In contrast, there were significant correlations between ordering a device and assessment of personal risk (after the intervention), and assessment of the severity of the potential damage to health. It must be pointed out as a restriction of the utility of this study that, some five months prior to the start of the study, fliers had been sent to the households because of a different campaign, which had a similar content to the message given to the experimental group.

CONCLUSIONS



Empirical findings of fear appeal research and theories for assessing and explaining health and preventive behaviour have been presented in this paper. The central question was what effects preventive messages based on fear appeals have on health-related intentions and health behaviour. The most important conclusions of this expert report will be drawn below, using 17 basic questions.

Can experienced fear influence health behaviour?

Numerous studies have been able to prove that fear of harm or disease constitutes a fundamental condition for changing health and risk behaviour. Fear of a disease was recorded using the following characteristics in these studies: the severity of the consequences of a disease, the personal consequences arising from the disease and the probability of developing this impairment within a foreseeable period. This experienced threat of a disease was recorded either after an intervention (e.g. film, information brochures, information event) or with no prior intervention. The experienced fear was related to attitudinal changes after an intervention or to health-related attitudes independent of prior experiences. The fear of disease proved to be an important predictor of behavioural intentions and behaviour throughout. At the same time, it must be stressed that mean correlations between the two characteristics are involved here, which naturally allow no complete prediction of health behaviour, so that it is not possible to assume a linear model between experienced fear and the extent of change in attitude or behaviour. The experienced fear or perceived threat is therefore only one important factor for changing health behaviour. In addition, the coping options of the individual are also of major importance for changes in health and preventive behaviour.

What influence does the strength of a fear appeal have on the attitude change?

The theoretical assumptions by Janis and McGuire were based on the idea that fear appeals have the greatest effect at a moderate level. Quantification of what is meant by a moderate fear level has so far not been provided empirically. This means that no conclusions can be formulated for the design of preventive messages on the basis of these theoretical approaches. The concern that excessive induction of fear will trigger a contrary effect is still present in many theoretical discourses and studies today. However, no empirical specification has been given as to the maximum fear level which can be tolerated before defence processes occur. More recent theories no longer assume a non-linear relationship between level of fear and attitudinal change, and this has also been shown in empirical studies. In these empirical investigations in the field of fear appeal research, a direct positive relationship has often been found between the extent of induced fear and the attitude change. If diseases were presented as potentially affecting the receiver, as entailing extreme consequential damage (e.g. fatal outcome) and as occurring relatively quickly, people made

greater use of preventive medical examinations or changed their behaviour (in the sense of reducing risky actions). The theories devised by Leventhal and Rogers can be mentioned as examples of these more recent theories. Both of these authors differentiate between the perceived fear of a health-related threat and the perceived coping options for averting this threat. On the basis of these theories, fear induction would appear to be useful as a motivating agent for behavioural change. However, presenting coping strategies is always necessary as a counterbalance. On the basis of these theories, the extent of an attitude change correlates with the extent of induced fear, although it is not possible to assume a linear relationship. All the investigations share a common laboratory-style nature, which makes the validity of the findings questionable. The extent to which fear induction succeeds at all in an everyday environment with the possibilities of distraction, cognitive avoidance or the option of evading the medium, has not yet been tested in the context of experiments close to the field.

What is meant by fear experience in the field of fear appeal research?

No agreement has been achieved to date as to when it is possible to talk of successful fear induction. This problem is partly the result of the fact that no standardised measuring instruments were used in most of the empirical studies but that, in the majority of cases, specifically designed tools were used for the individual problems investigated. This leads to the problem that constructs like concern, physiological activation, momentary anxiety, etc., are described as intense fear, depending on the study. There has not yet been adequate investigation into which elements contained in a persuasive message are responsible for a fear experience, i.e. connections have not always been found between a dramatic portrayal of negative consequences and the subjective fear experience of the receiver. Further basic research is still required in this context, so as to investigate more accurately the potential defence processes in persons receiving a persuasive message.

Are there factors which moderate the message as regards the effect of fear appeals?

A number of characteristics contribute to the prediction of health behaviour: health-related expected skills, i.e. the subjective assessment of the ability to implement relevant health behaviour, and health-related expected consequences (assumptions as to the effectiveness of an action). Numerous experimental studies have therefore attempted to examine health-related expected skills and expected consequences. Rogers and Leventhal distinguish between two processes in processing fear appeals. The first process is distinctive for assessment of the health threat as a result of new information. Simultaneously, the second process involves assessment of the options for coping with the threat. If fear appeals in the mass media succeed in communicating appropriate coping strategies (high

expected consequences and skills) for the threat presented, these messages may have a motivating effect and lead to health-related intentions or actions. Fear alone is thus not a suitable means. The communication of action skills is just as important as the presentation of threatening content.

What conclusions can be drawn from studies on expected self-efficacy?

The perception of a personal risk is regarded as a necessary, albeit insufficient, basic prerequisite for the initiation of protective and preventive health behaviour. This is at least true in those cases in which measures are undertaken primarily for health reasons. However, the question arises as to the extent to which threat appeals lose their threatening nature and thus their effect in the case of risks which have already become widespread and generally accepted as a result of mass media communication, since a certain degree of saturation has already been reached among those addressed. In this case, expected self-efficacy (and the components of expected skills and consequences) should be given greater consideration in the context of the design of preventive information and in the evaluation of mass media messages. It is assumed that a high level of perceived threat not only causes desired behaviour, but can also result in undesired behaviour. A high level of perceived personal threat may have an activating effect on both favourable and unfavourable coping strategies: it motivates the person to act. The type of processing in this case is partly dependent on the perceived expected self-efficacy. High levels of expected self-efficacy promote adaptive processing, whereas low skill values may lead to avoidance and maladaptive coping.

Is there proof of long-term changes in attitude due to fear appeals?

To date, studies on the mode of action of fear appeals in the field of prevention have almost exclusively dealt with short-term effects. Catamnestic studies with a long-term design have been conducted only rarely. On the basis of the current state of research, it can be assumed that fear appeals are more likely to have positive than negative effects in the long term. Based on Leventhal's model, it can be hypothesised that fear control (e.g. by means of distraction, questioning the information) is of only short-term significance, while danger control (e.g. reducing cigarette consumption) has a greater degree of motivation in the long term.

Are some addressees particularly receptive to fear appeals?

Studies in the field of fear appeal research to date have been only marginally concerned with the question of which groups of people are particularly receptive to fear appeals, and the extent to which other groups of people can be described as resistant. There are isolated

suggestions that people from higher social strata and with higher levels of education can be less well motivated by fear appeals. Gender-specific action on the part of fear appeals seems likely, since relevant differences have been demonstrated with other health-related constructs as well. However, the questions as to whether women or men exhibit greater changes in attitude after fear appeals and whether gender-specific processing patterns exist cannot yet be answered. The extent to which the age of the addressees affects the processing of fear appeals has also remained largely unexamined to date. In younger children, fear appeals with respect to negative social consequences regarding tooth-brushing behaviour proved to be more effective in comparison with the portrayal of long-term health problems arising from risky behaviour. In overall terms, the research findings on the effect of addressee attributes are insufficient to answer this question, both in quantitative terms and for methodological reasons.

Are there other appeals with greater effectiveness than fear appeals (e.g. humour, eroticism)?

A few comparison studies have compared fear appeals with appeals with different content and different emotional meanings. A negative health message (“Not doing sport is bad for your health”) and a positive self-confidence message (“Sport is good for your self-confidence”) proved to be particularly effective in terms of engaging in sports. In the case of HIV protective behaviour, the fear-related appeals proved superior with respect to the intention to protect against AIDS using condoms in the future, either with an unknown partner or with the current partner. In the field of dental prophylaxis, the portrayal of positive social consequences proved to be better than a negative portrayal of social consequences. It is apparent that individual findings exist on the differential efficacy of different forms of appeal, but there are no generally applicable findings.

Do defence processes exist which are activated if fear appeals are too strong?

The theories devised by Janis and McGuire postulated that defence processes occur if the fear generated is too great (e.g. reduced attentiveness, aggression) and that this causes fear appeals to lose their effect. On the basis of these considerations, numerous empirical studies have been carried out regarding defence processes in the event of excessively high fear induction. If the extent of attitudinal change is taken as a measure of the successful effect of the fear arousal message, only a few studies have been able to show a lesser attitude change at higher levels of fear. More recent studies based on the elaboration likelihood model or the heuristic-systematic model provide the opportunity of illustrating the process of information processing in the form of a model using a different scientific design. In some studies in this context, defence processes were seen following excessive fear induction. However, contradictory findings also exist which assume more attentive pro-

cessing at high fear levels owing to the greater relevance of the information. Overall, the question of defence processes has not been adequately clarified in empirical terms.

What effects do warnings regarding alcohol and tobacco consumption have?

The results of studies of the efficacy of warnings come chiefly from the USA and a distinction must be made between experimental work and field studies. Field studies have shown that people displaying risky behaviour (smoking cigarettes and drinking alcohol) are better able to recall and reproduce warnings. Consequently, it can be concluded that the target group is being reached by the warnings. But at the same time, it must be emphasised that the credibility of warnings varies greatly. While warnings on the risk of developing lung cancer as a result of smoking are considered credible, notes saying that you will be ill less often in future as a result of giving up smoking are assessed as not very credible. Context factors also have an effect on credibility. For example, the simultaneous presentation of an attractive person, extolling the virtues of the product (e.g. cigarettes) has a negative effect on the credibility of the warning attached regarding the risks of smoking. Field studies have shown that, in the majority of the population, individual warnings are mentally present and can also be reproduced. At the same time, focal points regarding content were evident, i.e. some diseases were more frequently associated with behaviour damaging to health. An example of this was seen in the context of alcohol consumption during pregnancy. Conversely, it must be stated that other impairments caused by alcohol consumption, which were also contained in warnings, were far less likely to be remembered (e.g. operating machinery).

What findings have been obtained regarding the perception of the risks of behaviour harmful to health?

Risk perception regarding specific diseases depends on the severity of the disease (mortality, disability, short-term impairment), the number of people threatened, and subjective control experience. Thus, subjective risk perception often does not correspond to the “real” risk, which is generally greater than the perceived risk. This phenomenon is described as unrealistic optimism. The extent to which unrealistic optimism has health-preserving functions, in terms of a carefree lifestyle, is unclear. The alternative possibility is that an unrealistic estimate of the risks of disease automatically has negative effects on health in the long term (functional optimism). These results are relevant in several ways for preventive campaigns. On the one hand, they concern the description of those receiving education campaigns, who must be classed, on the basis of current findings, as people with unrealistic risk assessment of modes of behaviour harmful to health. The studies also showed a high degree of stability over time for these cognitive factors. So, if we assume, on the basis of the theoretical model assumptions, that assessment of a particular kind of be-

behaviour as highly risky is an essential prerequisite for a change in behaviour, in terms of participation in preventive measures or the realisation of recommendations, the question arises as to what messages are necessary to achieve such a change.

Is it possible to alter risk perception?

The perception of a personal risk of developing a specific disease is a decisive characteristic affecting health and prevention behaviour. Information used for risk assessment is largely obtained from the mass media, from friends and acquaintances, and also from an individual's own experience. Attempts to date to alter risk assessment by means of the experimental feedback of information on health have yielded no concept with which people's risk perception could be consistently altered and influenced. Various forms of risk feedback have been examined: in addition to epidemiological statistics, survival curves and prevalence rates, which are taken into consideration in mass media prevention campaigns, individual risk assessments in personal communication were also given as feedback. In experimental studies, if a person was confronted with his or her individual risk of developing a disease in personal communication, this did not necessarily result in increased motivation to change or direct effects on health-related convictions and health behaviour (in contrast to the theoretical assumptions). The question also arises as to the extent to which a change in risk assessment in larger population groups can be achieved by mass communication messages. Slovic found two areas, the dreadful nature of a risk and the unknown nature of an event, which have a fundamental influence on risk assessment. Slovic's dimension of the dreadful nature of the risk is closely linked to the controllability of an event. It is clear that different areas of risky behaviour are addressed, depending on the nature of the prevention campaign. In the case of AIDS prevention, what was involved was a new type of disease which initially brought subjective controllability among those receiving the preventive messages into question. At the same time, the potential dread was high because of the epidemic spread of the disease predicted in magazines and on television. Slovic hypothesises that dread is a motivating factor for behavioural change. This explains why it was possible to achieve a fairly rapid change in behaviour in the field of AIDS prevention. Short-term changes at a behavioural level are far more difficult to achieve in other health-related areas. Neither alcohol consumption nor tobacco consumption have similar potential dread levels, meaning that, according to the risk assessment concept, no comparable changes in behaviour can be expected even on a long-term basis among the majority of the population.

What is the significance of health-related convictions of control regarding the demand for preventive measures?

Convictions of control have different importance for two different phases in the design of preventive information. In the phase involving seeking help or making use of a preventive

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intervention (e.g. courses being offered), a high level of conviction of social, external control is considered to be helpful. The task of those offering such a measure is thus to portray themselves as competent and to meet the need of the person for “external control”. In the second phase, i.e. during and after the intervention, however, it is essential that responsibility be transferred to the receivers. A fairly strong conviction of internal control is regarded as helpful to maintain the learned activities and for long-term stabilisation of the patient's health concept.

Is the extent of attitude change the best criterion for assessing the effectiveness of a medium?

The extent of attitude change is an important criterion for assessing the effectiveness of a mass communication message. The models in the field of attitudinal change research (ELM and HSM) have provided a re-assessment of this criterion. The process of attitude change has become an important additional assessment criterion. In these process models for information processing, a distinction is made between two ideally typical processes for processing messages. If information is processed systematically, the prerequisites are high motivation and ability on the part of the receiver, so as to be able to process the content of the message appropriately. Attitude changes based on systematic processing are regarded as being stable over time and related to behaviour. The other process for information processing is described as heuristic processing. Attitude changes on the basis of this process last for only a short time and are principally dependent on irrelevant characteristics of the message (such as liking for the presenter, a humorous presentation). The same extent of attitude change can, consequently, be based on two different processes. The extent of attitude change is thus not the only important criterion, the means by which this attitude change was brought about is also of importance. On the basis of the design of attitudinal formation and change research, individual message characteristics can be investigated with respect to their significance for either more heuristic or more systematic processing.

What recommendations can be formulated for the design of preventive messages?

It makes sense to use fear appeals in preventive campaigns. Fear appeals can generate changes in attitude which manifest as cognitive, affective and behaviour-related reactions. Numerous experimental studies have been able to show positive effects on health-related attitudes caused by fear appeals. At the same time, the communication of action skills and information for reducing fear within the messages is also very important. If a preventive measure or preventive behaviour is presented as meaningful and as reducing the risk after high fear induction, realisation of the recommended behaviour will often be seen. In other words, only with a combination of high fear and high expected self-efficacy can optimum efficacy of fear appeals be assumed.

Many studies assume defence processes at high fear levels. However, these defence processes were not revealed empirically in a lower degree of attitude change at high fear levels. Rather, a greater degree of attitude change was observed at high fear levels in the majority of studies. However, given the current state of research, the possibility cannot be ruled out that the attitude change after high fear induction is only temporary. The stability of the attitude over time and the relationship between attitude and behaviour are important criteria in the assessment of attitude changes. The process of change is incorporated into the assessment on the basis of the models produced by research into attitude change. This permits statements to be made regarding stability over time and the link between an attitude and behaviour.

The negative consequences should be expanded in designing preventive information. While the presentation of diseases following on from risky behaviour is a well-known and frequently used possibility for inducing fear, negative social consequences and immediately experienced impaired efficiency should also be taken into account in mass media campaigns. However, the presentation of positive social consequences on giving up the risky behaviour is also relevant.

What recommendations for the evaluation of education campaigns can be formulated on the basis of these results?

When evaluating mass media preventive messages or education campaigns, criteria from the social cognitive models of health behaviour should be taken into account in addition to spontaneous impressions of the receivers (e.g. liking, acceptance). These criteria are changes at the levels of expected self-efficacy or expected skills on the part of the receivers, as well as of the individual risk perception in terms of health-related risky behaviour. Attitudes to the risky behaviour and behavioural intentions should also be recorded to a greater extent. The measurement of criteria such as these after campaigns means that the effect of preventive messages in the population can be estimated. At the same time, in experimental scientific studies, these criteria allow evaluation of current campaigns. Control group studies should also be carried out in this context, allowing a comparative assessment of mass media. The target group orientation of preventive measures should be borne in mind in the evaluation of mass communication messages. To this end, it is necessary to experimentally test the reception and processing of preventive appeals in heterogeneous groups of people. This might make it possible, for example, to identify different groups of people in whom fear appeals have specific effects. Suggestions are also obtained as to the means and intensity with which mass communication appeals can reach specific groups of people. With respect to the design of the studies, attempts should be made to integrate field studies and experimental investigations. The advantage of this would be that it would be possible to fall back on pure research results and ascertain their validity in an applied problem area.

Which key questions of fear appeal research should be investigated in the future?

The experimental studies in the field of fear appeal research are subject to fundamental methodological limitations. On the one hand, these limitations can be seen in the drawing of the sample, since the majority of studies have been conducted with student test subjects. On the other hand, limitations are present in the transfer of the laboratory situation to practical conditions, with which fault is repeatedly found. For these reasons, studies which are geared to target groups for mass media prevention should be encouraged. In particular, studies in the primary prevention field and, within this sector, particularly studies with children and young people, have been conducted only rarely to date. Close links between experimental and applied research are a further requirement. This should also be taken into account when selecting the media studied: the use of existing media as the basis for experimental studies is necessary in order to obtain valid research results which can be converted for practical application.

The social cognitive models of health behaviour offer important information regarding the initiation and maintenance of health and prevention behaviour. However, studies based on these models have the disadvantage that there has often been no experimental variation of the mass media used. Similar problems are found in the case of process theories of attitude formation and attitude change which have, to date, principally investigated experimental problems with little reference to practical application. This leads to problems in formulating operating variables and design characteristics for effective prevention using mass media. Attempts need to be made to replicate these studies using field-oriented designs. This would allow integration of the pure research knowledge regarding the reception and processing of mass media with the research tradition of media impact research. The results of these studies could be used to develop impulses for the design of new media, since the process of reception and processing of persuasive messages would become more transparent.

Descriptive characteristics of people, with respect to the effect of fear appeals, should also be taken into account in applied research. The influence of prior experience, knowledge and prior attitudes to attitude-related topics, in particular, has been largely left out of research so far. Furthermore, sociodemographic characteristics have also been more or less ignored in terms of the differential efficacy of fear appeals. A scientific design must be demanded for new studies, integrating applied research based on the social cognitive models of health behaviour with pure research on the models from the field of attitude change research. Only a combination of laboratory experiments and field research will make it possible to demonstrate the (differential) efficacy of health-related media.

This expert report is based principally on American and British studies. There are many limitations to the transferability of these findings to the German-speaking area. By far the most important problem is that of the differing social norms as regards the behaviour be-

ing studied. Current political trends (e.g. banning cigarette smoking in public buildings in the USA) may also affect attitude changes and influence the reception and processing of fear appeals. Another problem concerns the standing, credibility and acceptance of mass media in the relevant countries. Comparable studies in the German-speaking area are not available. A research initiative for replicating and expanding the findings in the German-speaking world is urgently necessary.

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