Self-efficacy and health behaviours

1.0 General Background

Self-referent thought has become an issue that pervades psychological research in many domains. In 1977, the famous psychologist Albert Bandura at Stanford University introduced the concept of perceived self-efficacy in the context of cognitive behaviour modification. It has been found that a strong sense of personal efficacy is related to better health, higher achievement, and more social integration. This concept has been applied to such diverse areas as school achievement, emotional disorders, mental and physical health, career choice, and sociopolitical change. It has become a key variable in clinical, educational, social, developmental, health, and personality psychology. The present chapter refers to its influence on the adoption, initiation, and maintenance of health behaviours. It represents the key construct in Social Cognitive Theory (Bandura, 1977, 1986, 1991, 1992).

Behavioural change is facilitated by a personal sense of control. If people believe that they can take action to solve a problem instrumentally, they become more inclined to do so and feel more committed to this decision. While outcome expectancies refer to the perception of the possible consequences of one's action, perceived self-efficacy pertains to personal action control or agency (Bandura, 1992; Maddux, 1991, 1993; Wallston, 1994). A person who believes in being able to cause an event can conduct a more active and self-determined life course. This “can do”-cognition mirrors a sense of control over one's environment. It reflects the belief of being able to master challenging demands by means of adaptive action. It can also be regarded as an optimistic view of one's capacity to deal with stress.

Self-efficacy makes a difference in how people feel, think and act. In terms of feeling, a low sense of self-efficacy is associated with depression, anxiety, and helplessness. Such individuals also have low self-esteem and harbour pessimistic thoughts about their accomplishments and personal development. In terms of thinking, a strong sense of competence facilitates cognitive processes and academic performance. Self-efficacy levels can enhance or impede the motivation to act. Individuals with high self-efficacy choose to perform more challenging tasks. They set themselves higher goals and stick to them (Locke & Latham, 1990). Actions are preshaped in thought, and people anticipate either optimistic or pessimistic scenarios in line with their level of self-efficacy. Once an action has been taken, high self-efficacious persons invest more effort and persist longer than those with low self-efficacy. When setbacks occur, the former recover more quickly and maintain the commitment to their goals. Self-efficacy also allows people to select challenging settings, explore their environments, or create new situations. A sense of competence can be acquired by mastery experience, vicarious experience, verbal persuasion, or physiological feedback (Bandura, 1977). Self-efficacy, however, is not the same as positive illusions or unrealistic optimism, since it is based on experience and does not lead to unreasonable risk taking. Instead, it leads to venturesome behaviour that is within reach of one's capabilities.

2.0 Description of the Model

According to Social Cognitive Theory, human motivation and action are extensively regulated by forethought. This anticipatory control mechanism involves three types of expectancies: (a) situation-outcome expectancies, in which consequences are cued by environmental events without personal action, (b) action-outcome expectancies, in which outcomes flow from personal action, and (c) perceived self-efficacy, which is concerned with people's beliefs in their capabilities to perform a specific action required to attain a desired outcome.

Situation-outcome expectancies represent the belief that the world changes without one's own personal engagement. Risks are perceived, and persons may feel more or less vulnerable towards critical events that they anticipate. Individuals may sit and wait for things to happen, but illusions about the future may help one cope with threat. When, for example, people anticipate a disease they may distort its likelihood of occurrence. This can be seen as a defensive optimism. Defenses can be made in terms of social comparison bias, e.g., “I am less vulnerable than others to illness.” On the other hand, action-outcome expectancies and self-efficacy expectancies include the option to change the world and to cope instrumentally with health threats by taking preventive action. These action beliefs and personal resource beliefs reflect a functional optimism. Empirically, the distinction of the latter two is hard to confirm because the second does not operate without the first. In making judgments about health-related goals, people usually unite personal agency with means. Perceived self-efficacy implicitly includes some degree of outcome expectancies because individuals believe they can produce the responses necessary for desired outcomes.

Adopting health-promoting behaviours and refraining from health-impairing behaviours is difficult. Most people have a hard time making the decision to change and, later on, maintaining the adopted changes when they face temptations. The likelihood that people will adopt a valued health behaviour (such as physical exercise) or change a detrimental habit (such as quitting smoking) may therefore depend on three sets of cognitions: (a) the expectancy that one is at risk (“My risk of getting cancer from smoking is above average”), (b) the expectancy that behavioural change would reduce the threat (“If I quit smoking, I will reduce my risk”), and (c) the expectancy that one is sufficiently capable of adopting a positive behaviour or refraining from a risky habit (“I am capable of quitting smoking permanently”). In
order to initiate and maintain health behaviours, it is not sufficient to perceive an action-outcome contingency. One must also believe that one has the capability to perform the required behaviour. A large body of research has examined the role of optimistic self-beliefs as a predictor of behaviour change in the health domain (for an overview see Bandura, 1992; Maddux, 1993; O'Leary, 1992; Schwarzer, 1992). Behavioural change goals exert their effect through optimistic self-beliefs. These beliefs slightly overestimate perceived coping capabilities rather than simply reflect the existing ones.

Both outcome expectancies and efficacy beliefs play influential roles in adopting health behaviours, eliminating detrimental habits, and maintaining change. In adopting a desired behaviour, individuals first form an intention and then attempt to execute the action. Outcome expectancies are important determinants in the formation of intentions, but are less so in action control. Self-efficacy, on the other hand, seems to be crucial in both stages of the self-regulation of health behaviour. Positive outcome expectancies encourage the decision to change one's behaviour. Thereafter, outcome expectancies may be dispensable because a new problem arises, namely the actual performance of the behaviour and its maintenance. At this stage, perceived self-efficacy continues to operate as a controlling influence.

Perceived self-efficacy represents the belief that one can change risky health behaviours by personal action, e.g., by employing one's skills to resist temptation. Behaviour change is seen as dependent on one's perceived capability to cope with stress and boredom and to mobilize one's resources and courses of action required to meet the situational demands. Efficacy beliefs affect the intention to change risk behaviour, the amount of effort expended to attain this goal, and the persistence to continue striving in spite of barriers and setbacks that may undermine motivation. Perceived self-efficacy has become a widely applied theoretical construct in models of addiction and relapse (e.g., Donovan & Marlatt, 1988; Marlatt, Baer & Quigley, 1994; Marlatt & Gordon, 1985). This view suggests that success in coping with high-risk situations depends partly on people's beliefs that they operate as active agents of their own actions and that they possess the necessary skills to reinstate control should a slip occur. The common denominator of relapse prevention theory and the model to be described later on refers to the assumption of distinct stages and the claim that specific self-efficacy operates at these stages.

3.0 Summary of Research

In the following section, the relationship between self-efficacy and specific health behaviours is reviewed. A number of studies on adoption of health practices have measured self-efficacy to assess its potential influences in initiating behaviour change. As people proceed from considering precautions in a general way toward shaping a behavioural intention, contemplating detailed action plans, and actually performing a health behaviour on a regular basis, they begin to crystallize beliefs in their capabilities to initiate change. In an early study, Beck and Lund (1981) exposed dental patients to a persuasive communication designed to alter their beliefs about periodontal disease. Neither perceived disease severity nor outcome expectancy were predictive of adoptive behaviour when perceived self-efficacy was controlled. Perceived self-efficacy emerged as the best predictor of the intention to floss (r = .69) and of the actual behaviour, frequency of flossing (r = .44). Seydel, Taal and Wiegman (1990) report that outcome expectancies as well as perceived self-efficacy are good predictors of intention to engage in behaviours to detect breast cancer (such as breast self-examination) (see also Meyerowitz & Chaiken, 1987; Rippetoe & Rogers, 1987). Perceived self-efficacy was found to predict outcomes of a controlled-drinking programme (Sitharthan & Kavanagh, 1990). Perceived self-efficacy has also proven to be a powerful personal resource in coping with stress (Lazarus & Folkman, 1987). There is also evidence that perceived self-efficacy in coping with stresses affects immune function (Wiedenfeld et al., 1990). Subjects with high efficacy beliefs are better able to control pain than those with low self-efficacy (Altmaier, Russell, Kao, Lehmann & Weinstein, 1993; Litt, 1988; Manning & Wright, 1983). Self-efficacy has been shown to affect blood pressure, heart rate and serum catecholamine levels in coping with challenging or threatening situations (Bandura, Cioffi, Taylor & Brouillard, 1988; Bandura, Reese & Adams, 1982; Bandura, Taylor, Williams, Mefford & Barchas, 1985). Recovery of cardiovascular function in postcoronary patients is similarly enhanced by beliefs in one's physical and cardiac efficacy (C. B. Taylor, Bandura, Ewart, Miller & DeBusk, 1985). Cognitive-behavioural treatment of patients with rheumatoid arthritis enhanced their efficacy beliefs, reduced pain and joint inflammation, and improved psychosocial functioning (O'Leary, Shoer, Lorig & Holman, 1988). Obviously, perceived self-efficacy predicts degree of therapeutic change in a variety of settings (Bandura, 1992).

3.1 Sexual Risk Behaviour

Perceived self-efficacy has been studied with respect to prevention of unprotected sexual behaviour, e.g., the resistance of sexual coercions, and the use of contraceptives to avoid unwanted pregnancies. For example, teenage women with a high rate of unprotected intercourse have been found to use contraceptives more effectively if they believed they could exercise control over their sexual activities (Levinson, 1982). Gilchrist and Schinke (1983) taught teenagers through modeling and role-playing how to deal with pressures and ensure the use of contraceptives. This mode of treatment significantly raised their sense of perceived efficacy and protective skills. Sexual risk-taking behaviour such as not using condoms to protect against sexually transmitted disease has also been studied among homosexual men with multiple partners and intravenous drug users. Beliefs in one's capability to negotiate safer sex practices emerged as the most important predictor of such behaviours (Basen-Engquist, 1992; Basen-Engquist & Parcel, 1992; Kasen, Vaughn & Walter, 1992; McKusick, Coates, Morin, Pollack & Hoff, 1990; O'Leary, Goodhart, Jemmott & Boccher-Lattimore, 1992).

Influencing health behaviours that contribute to the prevention of AIDS has become an urgent issue. Perceived self-efficacy has been shown to play a role in such behaviours. Kok, De Vries, Mudde and Streecher (1991) reported a study from their Dutch laboratory that analyzed the use of condoms and clean needles by drug addicts. Intentions and behaviours were predicted by attitudes, social norms, and especially by efficacy beliefs. Perceived self-efficacy correlated with the intention to use clean needles (.35), reported clean needle use (.46), the intention to use condoms (.74), and reported condom use (.67) (Paulussen, Kok, Knibbe & Kramer, 1989). Bandura (1994) has summarized a large body of research relating perceived self-efficacy to the exercise of control over HIV infection.

Condom use not only requires some technical skills, but interpersonal negotiation as well (Bandura, 1994; Braddock & Beck, 1991; Coates, 1990). Convincing a resistant partner to comply with safer sex practices can call for a high sense of efficacy to exercise control
Motivating people to do regular physical exercise depends on several factors, among them optimistic self-beliefs of being able to perform appropriately. Perceived self-efficacy has been found to be a major instigating force in forming intentions to exercise and in maintaining the practice for an extended period (Dzewaltowski, Noble & Shaw, 1990; Feltz & Riessinger, 1990; McAuley, 1992, 1993; Shaw, Dzewaltowski & McElroy, 1992; Weinberg, Grove & Jackson, 1992; Weiss, Wiese & Klint, 1989). Dzewaltowski (1989) has compared the predictiveness of the Theory of Reasoned Action (Fishbein & Ajzen, 1975), and Social Cognitive Theory in the field of exercise motivation. The exercise behaviour of 328 students was recorded for seven weeks and then related to prior measures of different cognitive factors. Behavioural intention was measured by asking the individuals the likelihood that they will perform exercise behaviour. Attitude toward physical exercise, perceived behavioural control, and beliefs about the subjective norm concerning exercise were assessed. The Theory of Reasoned Action fit the data, as indicated by a path analysis. Exercise behaviour correlated with intention (.22), attitude (.18), and behavioural control beliefs (.13). In addition, three social cognitive variables were assessed: (a) strength of self-efficacy to participate in an exercise program when faced with impediments, (b) thirteen expected outcomes multiplied by the evaluation of those outcomes, and finally, (c) self-satisfaction or dissatisfaction with their level of activities and with the multiple outcomes of exercise. Exercise behaviour was correlated with perceived self-efficacy (.34), outcome expectancies (.15), and dissatisfaction (.23), as well as with the interactions of these factors. The higher the three social cognitive constructs were at the onset of the programme, the more days they exercised per week. Persons who were confident that they could adhere to the strenuous exercise programme were dissatisfied with their present level of physical activity and expected positive outcomes, and they exercised more. The variables in the Theory of Reasoned Action did not account for any unique variance in exercise behaviour after the influences of the social cognitive factor was controlled. These findings indicate that Social Cognitive Theory provides powerful explanatory constructs.

The role of efficacy beliefs in initiating and maintaining a regular program of physical exercise has also been studied by Desharnais, Bouillion and Godin (1986), Fuchs (in press), Long and Haney (1988), Sallis et al. (1986), Sallis, Hovell, Hofstetter and Barrington (1992), and Wurtele and Maddux (1987). Endurance in physical performance was found to be dependent on experimentally created efficacy beliefs in a series of experiments on competitive efficacy by Weinberg, Gould and Jackson (1979), Weinberg, Gould, Yukelson and Jackson (1981) and Weinberg, Yukelson and Jackson (1980). In terms of competitive performance, tests of the role of efficacy beliefs in tennis performance revealed that perceived efficacy was related to 12 rated performance criteria (Barling & Abel, 1983).

Patients with rheumatoid arthritis were motivated to engage in regular physical exercise by enhancing their perceived efficacy in a self-management program (Holman & Lorig, 1992). In applying self-efficacy theory to recovery from heart disease, patients who had suffered a myocardial infarction were prescribed a moderate exercise regime (Ewart, 1992). Ewart found that efficacy beliefs predicted both underexercise and overexertion during programmed exercise. Patients with chronic obstructive pulmonary diseases tend to avoid physical exertion due to experienced discomfort, but rehabilitation programmes insist on compliance with an exercise regimen (Toshima, Kaplan & Ries, 1992). Compliance with medical regimens improved after patients suffering from chronic obstructive pulmonary disease received a cognitive-behavioural treatment designed to raise confidence in their capabilities. Efficacy beliefs predicted moderate exercise (r = .47), whereas perceived control did not (Kaplan, Atkins & Reinsch, 1984).

3.3 Nutrition and Weight Control

Dieting and weight control are health-related behaviours that can also be governed by self-efficacy beliefs (Bernier & Avard, 1986; Chambless & Murray, 1979; Hofstetter, Sallis & Hovell, 1990; Glynn & Ruderman, 1986; Shannon, Bagby, Wang & Trenkner, 1990; Slater, 1989; Weinberg, Hughes, Crittelli, England & Jackson, 1984). Chambless and Murray (1979) found that overweight individuals were more responsive to behavioural treatment where they had a high sense of efficacy and an internal locus of control. Other studies on weight control have been published by Bagoozi and Warshaw (1990) and Sallis, Pinski, Grossman, Patterson and Nader (1988). It has been found that self-efficacy operates best in concert with general lifestyle changes, including physical exercise and provision of social support. Self-confident clients of intervention programs were less likely to relapse to their previous unhealthy diet.

In sum, perceived self-efficacy has been found to predict intentions and actions in different domains of health functioning. The intention to engage in a certain health behaviour and the actual behaviour itself are positively associated with beliefs in one’s personal efficacy. Efficacy beliefs determine appraisal of one’s personal resources in stressful encounters and contribute to the forming of behavioural intentions. The stronger people’s efficacy beliefs, the higher the goals they set for themselves, and the firmer their commitment to engage in the intended behaviour, even in the face of failures (Locke & Latham, 1990).

3.4 Self-Efficacy Approaches to Addictive Behaviours

Another area in the health field where perceived self-efficacy has been studied extensively is smoking. Quitting the habit requires optimistic self-beliefs which can be instilled in smoking cessation programmes (Baer & Lichtenstein, 1988; Carmody, 1992; Devins & Edwards, 1988; Haaga & Stewart, 1992; Ho, 1992; Karanci, 1992; Kok, Den Boer, DeVries, Gerards, Hospers & Mudde, 1992). Efficacy beliefs to resist temptation to smoke predict reduction in the number of cigarettes smoked (r = -.62), the amount of tobacco per smoke (r = -.43), and the nicotine content (r = -.30) (Goddin & Glasgow, 1985). Pretreatment self-efficacy does not predict relapse, but posttreatment self-efficacy does (Kavanagh, Pierce, Lo & Shelley, 1993). Mudde, Kok and Strecher (1989) found that efficacy beliefs increased after treatment, and those who had achieved the highest levels of self-efficacy remained successful quitters as assessed in a
Five Kinds of Self-Efficacy Pertaining to Addictive Behaviours

Marlatt et al. (1994) propose five categories of self-efficacy that are related to stages of motivation and prevention: (a) Resistance Self-Efficacy, (b) Harm-Reduction Self-Efficacy, (c) Action Self-Efficacy, (d) Coping Self-Efficacy, and (e) Recovery Self-Efficacy.

Resistance Self-Efficacy pertains to the confidence in one's ability to avoid substance use prior to its first use. This implies resistance against peer pressure to smoke, drink or take drugs. It has been repeatedly found that the combination of peer pressure and low self-efficacy predicts the onset of smoking and substance use in adolescents (Conrad, Flay & Hill, 1992). Ellickson and Hays (1991) studied the determinants of future substance use in 1,138 eighth and ninth graders in ten junior high schools. As potential predictors of onset, they analyzed prodrug social influence, resistance self-efficacy, and perception of drug-use prevalence. Social influence or exposure to drug users combined with low self-efficacy for drug resistance turned out to predict experimentation with drugs nine months later. Interestingly, resistance self-efficacy was no longer predictive in the subsample of students who were already involved with drugs.
In a study on smoking onset, Stacy, Sussman, Dent, Burton and Flay (1992) examined prosmoking social influence and resistance self-efficacy in a sample of 1,245 California high school students. Perceived self-efficacy moderated the effect of peer pressure. As expected, many adolescents succumbed to prosmoking influence, but those high in resistance self-efficacy were less vulnerable toward interpersonal power.

With these findings in mind, one would expect that the training of resistance skills would raise resistance self-efficacy, which in turn would reduce future drug use. However, intervention studies that have included such a training have not yet been very promising (Hansen, Graham, Wolkenstein & Rohrbach, 1991; Ellickson, Bell & McGuigan, 1993).

Harm-reduction self-efficacy pertains to one's confidence to be able to reduce the risk after having become involved with tobacco or drugs. Once a risk behaviour has commenced, the notion of resistance loses its significance. It is then of superior importance to control further damage and to strengthen the belief that one is capable of minimizing the risk. This is particularly useful since most adolescents at least experiment with cigarettes and alcohol, which can be regarded as a normal stage in puberty when youngsters face developmental tasks including self-regulation in tempting situations. Substance use can be seen as being normative rather than deviant and might reflect a healthy exploratory behaviour and a constructive learning process (Newcomb & Bentler, 1988; Shedler & Block, 1990). The conflict here is between solving normative developmental tasks on the one hand, and, on the other, initiating a risk behaviour that might accumulate and habitualize to a detrimental lifestyle pattern. Thus, the question is, “How can a drug be curiously explored without becoming the gateway drug?” The answer lies in the notion of harm-reduction self-efficacy. The individual must acquire not only the competence and skills, but also the optimistic belief in control of the impending risk. The aim of secondary prevention is to let adolescents experiment while at the same time empowering them to minimize and eliminate substance use later on.

An intervention study to accomplish this goal has been conducted at the Addictive Behaviours Research Center at the University of Washington (Baer, 1993; Baer, Marlatt, Kivlahan, Fromme, Larimer & Williams, 1992). College students received one of three treatments: (a) an alcohol-information class dealing with negative consequences of alcohol, (b) a moderation-oriented cognitive-behavioural skills-training class, and (c) an assessment-only control group. The second treatment group was trained to enhance their harm-reduction self-efficacy, which indeed resulted in the greatest decrease in alcohol consumption.

The above two types of self-efficacy are related to prevention. When, however, it comes to behaviour change for those who are already addicted, the focus turns to action, coping, and recovery. Action self-efficacy concerns the confidence to attain one's desired abstinence goal (or controlled use). If, for example, someone sets a date for quitting, then a commitment is made, moving the person beyond the mere contemplation stage. When intentions to quit are translated into preparatory acts, the individual needs optimistic self-beliefs to make detailed plans on how to refrain from the substance, imagine success scenarios, and take instrumental actions. This applies to unaided cessation as well as to formal treatment settings. Action self-efficacy has been found to predict attempts to quit smoking (Marlatt, Curry & Gordon, 1988; Sussman et al., 1989). As early as 1981, many smoking cessation studies have included self-efficacy to predict abstinence (Baer, Holt & Lichtenstein, 1986; Colletti et al., 1985; Conditte & Lichtenstein, 1981; DiClemente et al., 1985; Garcia et al., 1990; Godding & Glasgow, 1985; Ho, 1992; Karanci, 1992; Kok et al., 1992; Wilson et al., 1990). These findings corroborate consistently the beneficial influence of optimistic self-beliefs, but this effect is restricted to posttreatment self-efficacy. Typically, pretreatment self-efficacy does not predict relapse, but posttreatment self-efficacy does. This generalizes, by the way, to a broad range of domains of human functioning (Marlatt, Baer & Quigley, 1994; Kavanagh et al., 1993; Kok et al., 1992). Pretreatment self-efficacy is not based on personal experience with quitting and is, therefore, inappropriate for the prediction of treatment outcomes. During the cessation training, self-efficacy is being developed with a realistic sense of one's capabilities, resulting in more accurate self-knowledge that allows one to foresee one's most likely reactions in tempting situations.

Coping self-efficacy relates to anticipatory coping with relapse crises. After one has made a successful attempt to quit, long-term maintenance is at stake. At this stage, quitters are confronted with high-risk situations, such as experiencing negative affect or temptations in positive social situations. Lapses are likely to occur unless the quitter can mobilize alternative coping strategies. Believing in one's coping reserves assists in making sound judgments and in initiating adaptive coping responses. Relapse prevention training aims at making use of a variety of situation-tailored coping strategies which in turn enhances coping self-efficacy (Curry, 1993; Gruder et al., 1993; Marlatt & Gordon, 1985). This includes behavioural as well as cognitive coping modes.

Recovery self-efficacy is closely related to coping self-efficacy, but both tap different aspects within the maintenance stage (similar to the distinction between resistance and harm-reduction self-efficacy in the prevention stage). If a lapse occurs, individuals can fall prey to the "abstinence violation effect", i.e., they attribute their lapse to internal, stable and global causes, dramatize the event, and interpret it as a full-blown relapse (Marlatt & Gordon, 1985). High self-efficacious individuals, however, avoid this effect by making a high-risk situation responsible and by finding ways to control the damage and to restore hope. Self-efficacy for recovery of abstinence after an initial lapse has been found to promote long-term maintenance. Clinical interventions focus on specific recovery strategies after setbacks, such as reviewing and reattributing the situation, balancing alternative ways of coping, making an immediate plan for recovery (e.g., renew initial commitment to quit, mobilize social support, reframe the lapse as a normal event within a productive learning process) (Curry & Marlatt, 1987). This restores self-efficacy and helps to return quickly to the path of maintenance. However, Haaga and Stewart (1992) found that not high but moderate self-efficacy for recovery leads to the best survival rates (continuation of abstinence). If this finding can be replicated in further research, it would reflect an "overconfidence effect," since too high self-efficacy would embolden trials of risk behaviours.

As these examples from research on addictive behaviours demonstrate, it is essential to identify several stages at which self-efficacy operates in different manners. Specific kinds of self-efficacy are protective as the individual moves through the process of peer influence, substance experimentation, cessation, and abstinence maintenance. Psychological interventions have to be stage-
4.0 Developments

Over the years, the notion of self-efficacy has become so appealing to health psychologists that it has been adopted as part of most health behaviour theories. Becker and Rosenstock (1987) have incorporated it into their Health Belief Model, mainly by reinterpreting what used to be “barriers” to action. Ajzen (1988, 1991) has extended the Theory of Reasoned Action to the Theory of Planned Behaviour by adding a predictor labeled “perceived behavioural control,” which is about the same as self-efficacy (see Conner & Sparks, this volume). Maddux and Rogers (1983) have incorporated self-efficacy as one major determinant of intentions in their Protection Motivation Theory (see also Maddux, 1993; Seydel & Boer, this volume). These theories are described in more detail in other chapters of this book (see also Schwarzer, 1992; Wallston, in press; Weinstein, 1993). Thus, “self-efficacy models” are no longer really distinct from other approaches since the key construct that was originally developed within Bandura’s Social Cognitive Theory has meanwhile proven to be an essential component in all major models.

In this section, we would like to describe our own extensions of previous models, the Health Action Process Approach (HAPA), that is in particular influenced by Social Cognitive Theory. Its basic notion is that the adoption, initiation, and maintenance of health behaviours must be explicitly conceived as a process that consists of at least two stages, a motivation phase and a volition phase. The latter might be further subdivided into a planning phase, action phase, and maintenance phase. It is claimed that self-efficacy plays a crucial role at all stages, while in contrast other cognitions are of limited scope. For example, risk perceptions serve predominantly to set the stage for a contemplation process early in the motivation phase but do not extend beyond. Similarly, outcome expectancies are chiefly important in the motivation phase when individuals balance the pros and cons of certain consequences of behaviours, but they lose their predictive power after a personal decision has been made. However, if one does not believe in one’s capability to perform a desired action, one will fail to adopt, initiate and maintain it.

Behavioural intentions are far from being sufficient to initiate a difficult action such as reframing from smoking or switching to a diet. There is a postintentional and preactional process that can be called a “volitional process,” or simply a planning stage (Bagozzi, 1992; Heckhausen & Gollwitzer, 1987; Karoly, 1993; Kuhl & Beckmann, 1993). Several authors have suggested stage models that may account for this phenomenon. Prochaska and DiClemente (1983, 1984), for example, have put forward their *Transtheoretical Model of Change* that starts with precontemplation where individuals have not thought at all about the health issue. In the subsequent contemplation stage they develop a motivation to change. Afterwards, they enter a preparation stage before the actual behaviour is finally performed. This preparation stage reflects a postintentional preactional state.

Similarly, Weinstein and Sandman (1992) have suggested a six-stage model. They distinguish individuals who are unaware of the issue or unengaged by it from those who are just deciding about acting. Before they finally initiate the new behaviour they have “decided to act.” Again, this is a postintentional preactional state that deserves further scientific attention.

In the Health Action Process Approach (HAPA; Schwarzer, 1992; Figure 1) this critical state is also explicitly considered as part of a volition process. It is labeled “action plans” - individuals prepare for the intended behaviour by imagining scenarios of how and under which circumstances they could perform specific acts. In this stage, self-efficacy plays a crucial role because individuals rely more or less on optimistic self-beliefs when facing self-imposed challenges. Subsequent performance then represents a successful outcome of cognitive activities in the planning and preparation stage. The association between self-efficacy and performance thus reflects intermediate cognitive processes that have been left unmeasured in past research. The postintentional preactional state is influenced by self-referent thought about how to prepare and initiate a novel health behaviour which, then, is reflected in individual differences in subsequent health behaviours.

4.1 The Motivation Phase

In the motivation phase, the individual forms an intention to either adopt a precaution measure or change risk behaviours in favour of other behaviours. This has also been conceived as a decision-making stage by some authors (Eiser, 1983; Eiser & Sutton, 1977; Fishbein & Ajzen, 1975). Today, it is known that self-efficacy and outcome expectancies are the major predictors of intentions. Most previous models treat these two as being unrelated predictors. However, there might be a temporal and causal order among them. Bandura (1989) has underscored that their interrelationship should also be taken into consideration: “...the effects of outcome expectancies on performance motivation are partly governed by self-beliefs of efficacy. There are many activities that, if performed well, guarantee valued outcomes, but they are not pursued if people doubt they can do what it takes to succeed... Self-perceived inefficacy can thus nullify the motivating potential of alluring outcome expectations...When variations in perceived self-efficacy are partialed out, the outcomes expected for given performances do not have much of an independent effect on behaviour” (p. 1180). Outcome expectancies can be seen as precursors of self-efficacy because people usually make assumptions about the possible consequences of behaviours before inquiring whether they can take the action themselves. If self-efficacy is specified as a mediator between outcome expectancies and intention, the direct influence of outcome expectancy on intention may dissipate. But the research findings on this issue are very inconsistent, rendering both cognitions primary candidates for motivating change. Under conditions where individuals have no experience with the behaviour they are contemplating, we assume that outcome expectancies may have a stronger direct influence. Only after a sufficient level of experience is attained does self-efficacy receive the lion’s share of the intention variance.

A specific subset of outcome expectancies, namely social outcome expectancies, should also be considered explicitly as determinants within the motivation phase, as proposed in the Theory of Reasoned Action and the Theory of Planned Behaviour, where this has been called subjective norm or normative beliefs. People often develop intentions because they perceive social pressures to do so. Individuals comply with the perceived expectations of significant others in order to receive gratifications or to
The interplay between perceived severity of an illness, perceived vulnerability, and the resulting threat, as hypothesized in the Health Belief Model, is still undetermined. The influential role of threat or risk perception in the motivation and volition process has been overestimated in past research and interventions. Fear appeals are of limited value; the message has to be framed in a way that allows individuals to draw on their coping resources and to exercise skills in order to control health threats. In persuasive communications, a focus should be made on self-percepts of personal coping capabilities to manage effective precaution strategies (Bandura, 1991). This suggests a causal order where threat is specified as a distal antecedent that helps to stimulate outcome expectancies which further stimulate self-efficacy. A minimum level of threat or concern must exist before people start contemplating the benefits of possible actions and ruminating their competence to actually perform them. The direct path from threat to intention may become negligible if expectancies are already well established.

In establishing a rank order among the three direct paths that lead to intention, it is assumed that self-efficacy dominates, followed by outcome expectancies, whereas threat (or risk perceptions) may fail to contribute any additional direct influence. As indirect factors, however, threat may be of considerable significance within the motivation phase. As mentioned above, the context and one's personal experience play a role and may change the pattern of weights.

4.2 The Action Phase

It is common knowledge that good intentions do not necessarily guarantee corresponding actions. Correlations between intentions and behaviours vary tremendously. The previously mentioned theories refer more generally to barriers or costs as the reasons for this gap, and they list a number of impediments, such as situational constraints or lack of willpower. The Theory of Planned Behaviour, which was designed for the case of incomplete control over behaviour, makes an attempt to quantify this problem by specifying a direct link between perceived behavioural control and behaviour, thus circumventing the intention. More theoretical elaborations are required, however, to better understand the processes involved. Relapse prevention theory (Marlatt & Gordon, 1985), volition theory (Heckhausen, 1991; Kuhl, 1983), and self-efficacy theory (Bandura, 1977, 1986) have sparked the following ideas.

While in the motivation phase it is described what people choose to do, in the subsequent action or volition phase it is described how hard they try and how long they persist. The right-hand part of Figure 1 consists of three levels: cognitive, behavioural, and situational. The focus is on cognitions that instigate and control the action, i.e., a volitional or self-regulative process which is subdivided into action plans and action control.

When a preference for a particular health behaviour has been shaped, the intention has to be transformed into detailed instructions of how to perform the desired action. If, for example, someone intends to lose weight, it has to be planned how to do it, i.e., what foods to buy, when and how often to eat which amounts, when and where to exercise, and maybe even whether to give up smoking as well. Thus, a global intention can be specified by a set of subordinate intentions and action plans that contain proximal goals and algorithms of action sequences. The volition process is hardly influenced by outcome expectancies, but more strongly by self-efficacy, since the number and quality of action plans are dependent on one's perceived competence and experience. Self-efficacy beliefs influence the cognitive construction of specific action plans, for example by visualizing scenarios that may guide goal attainment. These postdecisional preactional cognitions are necessary because otherwise the person would act impulsively in a trial-and-error fashion and would not know where to allocate the available resources.

Once an action has been initiated, it has to be controlled by cognitions in order to be maintained. The action has to be protected from being interrupted and abandoned prematurely due to incompatible competing intentions which may become dominant while a behaviour is being performed. Meta-cognitive activity is needed to complete the primary action and to suppress distracting secondary action tendencies. Daily physical exercise, for example, requires self-regulatory processes in order to secure effort and persistence and to keep other motivational tendencies at a distance (such as the desire to eat, socialize, or sleep) until these tendencies can prevail for a limited time period.

When an action is being performed, self-efficacy determines the amount of effort invested and the perseverance. People with self-doubts are more inclined to anticipate failure scenarios, worry about possible performance deficiencies, and abort their attempts prematurely. People with an optimistic sense of self-efficacy, however, visualize success scenarios that guide the action and let them persevere in face of obstacles. When running into unforeseen difficulties they quickly recover. Performing an intended health behaviour is an action, just as is refraining from a risk behaviour. The suppression of health-detrimental actions requires effort and persistence as well, and therefore is also guided by a volitional process that includes action plans and action control. If one intends to quit smoking or drinking, one has to plan how to do it. For example, it is important to avoid high-risk situations where the pressures to relapse are overwhelming. Attaining proximal subgoals helps increase the difficulty level of situations until one can resist under all possible circumstances. If someone is craving a cigarette or a drink, action control helps him or her to survive the critical situation. For example, individuals can make favourable social comparisons, refer to
Kaplan and Ries (1992). Exercise self-efficacy scales for patients coping with chronic disease were designed by Holman and Lorig (1992) and Toshima, Kaplan and Ries (1992).

Various psychometric instruments have been developed to assess self-efficacy for physical activities, such as the Diving Efficacy Scale by Feltz, Landers and Raeder (1979), the Physical Self-Efficacy Scale by Ryckman, Robbins, Thornton and Cantrell (1982), the Exercise Self-Efficacy Scale by Garcia and King (1991), and others (Barling & Abel, 1983; Fruin, Pratt & Owen, 1991; Fuchs & Schwarzer, 1994; Godin, Valois & Lepage, 1993; Marcus & Owen, 1992; Woolfolk, Murphy, Gottesfeld & Atkin, 1985). Physical exercise self-efficacy scales for patients coping with chronic disease were designed by Holman and Lorig (1992) and Toshima, Kaplan and Ries (1992).

One of the major action control paradigms is the delay of gratification pattern. Children already possess the meta-cognitive skills to suppress the craving for a small piece of candy if they are promised to obtain a bigger one at a later point in time; they apply cognitive distraction and other techniques for this purpose (Mischel, 1966, 1973). A similar paradigm can be found in disease prevention. If children comply to brush and floss their teeth regularly, they are promised not to suffer from tooth decay or periodontal disease several decades later. Evidently, it requires an immense volitional strength (after the necessary intention is given) to obtain this kind of gratification, which can hardly be expected from the majority of human beings. After a circumscribed action has been completed, the individual evaluates it as successful or failing and attributes the perceived outcome to possible causes. Dependent on this cognitive event, emotions and expectancies are varied, and the volitional strength may be increased or decreased for subsequent similar actions. Self-reinforcement is seen as a favourable meta-cognitive strategy.

Finally, situational barriers as well as opportunities have to be considered. If situational cues are overwhelming, meta-cognitive skills fail to protect the individual and the temptation cannot be resisted. Actions are not only a function of intentions and cognitive control, but are also influenced by the perceived and the actual environment. A social network, for example, that ignores the coping process of a quitter by smoking in his presence, creates a difficult stress situation which taxes the quitter's volitional strength. If, on the other hand, a spouse decides to quit too, then a social support situation is created that enables the quitter to remain abstinent in spite of lower levels of volitional strength.

In sum, the action phase can be described along three levels: cognitive, behavioural, and situational. The cognitive level refers to self-regulatory processes that mediate between the intentions and the actions. This volitional process contains action plans and action control and is strongly influenced by self-efficacy expectancies, but also by perceived situational barriers and support.

5.0 Operationalization of the Model

The three major cognitions that operate during the motivation phase can be assessed by single items such as the following:

- **Risk Perception**
  My risk of getting lung cancer is
  
  very low low high very high
  
  compared to the average person of my age and sex.

- **Outcome Expectancy**
  If I would stop smoking, then it would reduce my risk of lung cancer.
  
  not at all true hardly true somewhat true very true

- **Perceived Self-Efficacy**
  I am certain that I can resist to smoke even when I drink alcohol with my buddies.
  
  not at all true hardly true somewhat true very true

It is of note that the first kind of cognition, risk perception, need not be the same as threat experience, and the relationship between the two still awaits theoretical and empirical elaboration. To make test construction simple, one can keep in mind that outcome expectancies are best worded with *if-then* statements, and self-efficacy items as *confidence*-statements. The semantic structure of outcome expectancies are:

- "If *(behaviour)*, then *(consequences)*";

For self-efficacy the corresponding wording could be:

- "I am confident that I can *(perform something)*, even if ... *(barrier)*".

This rule need not be applied rigidly, but should serve as a heuristic. It is suggested to assess a variety of outcome expectancies, including positive and negative ones. People have many reasons why they should quit smoking or why they find it better to continue. The test items should cover the scope of pros and cons that an individual balances. It is also suggested not to present different constructs neatly separated in the questionnaire, but rather to scramble them so that the respondents don't realize at first glance what this is all about.

However, there is no way to determine the reliability of single items, and therefore one might want to consider using psychometric scales that consist of a number of items. These scales are, of course, less economical, but they often help to assure that the theoretical constructs are tapped by the sum score and that they are measured more reliably. Self-efficacy scales that are more or less adequate have been published for all kinds of health behaviours.
There are two basic methods to design a risk-behaviour self-efficacy scale. One is to confront the individual with a list or hierarchy of tempting situations and to assess situation-specific self-efficacy in line with these demands. The second approach aims at the restricted use of substances, asking subjects whether in general they feel competent to control the behaviour in question (irrespective of specific risk situations). In the domain of smoking, for example, the first method has been chosen by Colletti et al. (1985), and Velicer et al. (1990). In research on drinking, it has been preferred by Annis (1982), Annis and Davis (1988), DiClemente et al. (1985), and Miller, Ross, Emmerson and Todt (1989). The second approach was chosen by Godding and Glasgow (1985), for example, to assess smoking self-efficacy. For alcohol consumption, instruments were presented by Rychtarik, Prue, Rapp and King (1992), Sitharthan and Kavanagh (1990), and Young, Oei and Crook (1991). A third attempt to assess self-efficacy has been published by Haaga and Stewart (1992), who developed an "articulated thoughts technique" to measure recovery self-efficacy after a setback from smoking abstinence.

Scales for self-efficacy for smoking, dieting, physical exercise, condom use, cancer screening, and social support provision can be found in Schwarzer (1993). These scales are available in English, Spanish, and German. A generalized self-efficacy scale is available in more languages.

In addition to the assessment of risk perception, outcome expectancies, and self-efficacy, it is essential to identify the individual's motivation stage. A unique way to arrive at some idea about one's stage is given by a single-item self-report measure, the "contemplation ladder" (Biener & Abrams, 1991).

Inconsistency in research findings is partly due to heterogeneous designs of the assessment methods. The present recommendations might help to standardize the construction rationales, but not the inventories themselves.

### The Contemplation Ladder

Each rung on this ladder represents where various smokers are in their thinking about quitting. Circle the number that indicates where you are now.

- 10 Taking action to quit (e.g., cutting down, enrolling in a program).
- 9
- 8 Starting to think about how to change my smoking patterns.
- 7
- 6
- 5 Think I should quit but not quite ready.
- 4
- 3
- 2 Think I need to consider quitting someday.
- 1
- 0 No thought about quitting.

### 6.0 Application of the Model

To explore the interplay between self-efficacy, outcome expectancies, and risk perceptions, a longitudinal data set of about 800 citizens of Berlin, Germany, was analyzed. In the summer of 1992, participants (18-70 years of age) were asked to fill out a self-administered questionnaire on health cognitions and behaviours. A second wave of measurement took place six months later. Multiple regression analyses presented here are based on the following measures: Self-efficacy toward healthy eating behaviour was assessed by a scale consisting of six items (internal consistency: alpha = .76). A typical item was: "If I commit myself to eating healthy foods, then I can persist with it" (1 - 4). Positive outcome expectancies regarding a healthy eating behaviour were measured by seven items, such as "If I stick to a low-fat diet, my risk of a myocardial infarction would be reduced" (1 - 5). Negative outcome expectancies (5 items) had the same format, but referred to undesired consequences of a healthy eating behaviour, for example "If I stick to a low-fat diet then I need to spend more time for preparing the meals". Risk perception (perceived vulnerability) was assessed by two items: (1) "Compared to other persons of my age and sex, my risk of suffering a heart attack or stroke is... [much smaller ... the same as that of the others ... much higher; 1-7]", and (2) "How likely do you think it is that you will get a heart attack or stroke in the future?" [very unlikely ... very likely; 1-7]. The index healthy eating behaviour was based on frequency responses to 13 items with the format "How often do you usually eat salad or raw vegetables [red meat; cake or cookies; nuts or chips; fresh fruit; sausage (salami, ham, etc.); whole milk...]?" Items were classified into three groups of products (foods high in fat/cholesterol, high in sugar, and high in fiber) and were summed up within each group separately. Finally, these group scores were used to calculate the "healthy eating behaviour" index (the higher the value, the more health-conscious the eating behaviour). The intention to eat healthy foods was measured by two items of the type "I intend to eat as healthfully as possible during the next few months" (1-7).

Hierarchical regression analyses were computed where interaction terms were entered at the second step after all main effects had been considered. The first analysis aimed at the prediction of the intention. Table 1 shows the results separately for men and women.
Results are similar for both sexes. Health-related cognitions and prior behaviour jointly account for about 28% to 29% of the intention variance, with positive outcome expectancies being most influential. Risk perceptions and all interactions did not contribute to the prediction. The same kind of analysis has been replicated with intentions being measured half a year later, but no substantial differences to the above results emerged. Thus, an interaction model of intention prediction was not supported by the present data.

Next, the same three social-cognitive predictors were used to determine their possible influence at the volition stage of health behaviour. The intention was added as a predictor of healthy eating behaviour half a year later. Table 2 shows the results of the regression analysis.

Table 2 Prediction of healthy eating behaviour half a year later (Wave 2)

Men (n = 353) Women (n = 462)
Sex differences emerged here. For men, intention was a markedly better predictor of future eating behaviour than for women. Most interestingly, self-efficacy was the best predictor in data set of women. Women who believed they can persist eating healthy foods consume indeed less fat and cholesterol and eat more fruits and vegetables than those who did not share this belief.

In the Theory of Planned Behavior (Ajzen, 1988), perceived behavioural control (that is about the same as perceived self-efficacy) is expected to influence behaviour through intentions, but it can also influence behaviour directly. The explanation for the latter case is that behaviour may not be under volitional control. If an action cannot be performed due to a lack of resources or opportunities then the best intentions are worthless. If, for example, people intend to eat healthfully, but perceive realistically that no health foods are available in a certain situation, perceived behavioural control would be a good direct predictor of the behaviour.

To further clarify the role of self-efficacy, outcome expectancies and risk perception in predicting intention and behaviour, a more complex analysis was computed. Since no interactions had turned out to be of importance, a structural equation model was specified that was limited to main effects which can be subdivided into direct and indirect effects. Such kind of path analysis is appropriate in particular to test mediator hypotheses. Each latent variable was associated with two observed variables. The model was tested by use of the LISREL 8 program (Jöreskog & Sörbom, 1993).

---Insert Figure 2 about here----

The path model in Figure 2 refers to the subsample of 353 men and obtained a rather good data fit ($c^2 = 47.9$, $df = 41$, $p = .21$, $RMR = .049$, $GFI = .98$). Intention was predicted by positive outcome expectancies (.58) and self-efficacy (.29), whereas behaviour was mainly predicted by intention (.50) and self-efficacy (.37). For women, the same structural model also obtained a reasonable data fit; however, the key difference was found in a significant path (.34) from negative outcome expectancy to intention. In sum, these results suggest that self-efficacy cognitions are not only important in establishing perceived self-efficacy construct. According to Bandura, self-efficacy is not the “magic bullet” to solve all problems that can arise in the prediction and treatment of behavioural change.

Peer pressure usually appears to have higher predictive value, and its counterpart, social support, also has a high potential as a resource factor (Schwarzer & Leppin, 1991). On the other hand, social influence is not unconfounded with self-efficacy. The degree to which peer pressure makes a difference also depends on the individual’s resistance self-efficacy; the degree to which social support operates also rests on one’s self-efficacy to build, maintain and mobilize social networks.

7.0 Future Directions

Theoretical process approaches to the adoption and maintenance of health behaviours should include distinct stages of motivation and volition as well as the construct of self-efficacy, which has turned out to be the most powerful single resource factor. However, self-efficacy is not the "magic bullet" to solve all problems that can arise in the prediction and treatment of behavioural change. Peer pressure usually appears to have higher predictive value, and its counterpart, social support, also has a high potential as a resource factor (Schwarzer & Leppin, 1991). On the other hand, social influence is not unconfounded with self-efficacy. The degree to which peer pressure makes a difference also depends on the individual's resistance self-efficacy; the degree to which social support operates also rests on one's self-efficacy to build, maintain and mobilize social networks.

An open question refers to the optimal degree of specificity or generality of the self-efficacy construct. According to Bandura, perceived self-efficacy should always be as situation-specific as possible. This specificity issue can even be further subdivided into a formal and a substantial facet. In a formal sense, Marlatt et al. (1994) have conceptualized five kinds of self-efficacy that reflect different stages. In a substantial sense, one has to tailor the questions to the situation, for example smoking cessation or condom use. Although there is nothing wrong with more and more specificity, there still exist generalized measures that have considerable predictive value (Mittag & Schwarzer, 1993; Snyder et al., 1991; Wallston, 1992). Self-efficacy can be a generalized trait reflecting a personal resource factor to cope with stress in various life domains. In this sense, it mirrors optimistic self-beliefs that relate to confidence in one's overall coping resources. There are a few theoretical differences between dispositional optimism (as understood by Scheier & Carver, 1992) and generalized self-efficacy, but the empirical association is above .60 (Schwarzer, 1994). Optimism is a broader construct that can be further subdivided into defensive and functional optimism (S. E. Taylor, 1989). Most people are unrealistically optimistic when they assess situation-outcome relationships. They feel less vulnerable towards health threats than they should, and they believe that their reference group is at greater risk for diseases than themselves (Weinstein, 1982). Also, most people believe that their actions will produce positive outcomes and that they are personally capable of coping with their life demands. The former has been called defensive optimism, the latter functional optimism. Functional optimism not only relies on positive outcome expectancies, but more so on personal coping resources, including self-efficacy. If perceptions are distorted, then it is likely that some people overestimate their capabilities. Evidence has only been found by Haaga and Stewart (1992), whose high-efficacy subjects did not recover as well from lapses as their moderate-efficacy subjects. Perceived self-efficacy has to be optimistic to generate motivational power and should be somewhat overly optimistic, not exceeding a certain limit where unrealistic optimism leads to disappointment or harm. Previous interventions have focused on risk communication to lower defensive optimism. The idea was to let people understand how much they really are at risk. This intervention strategy was
obviously not very successful. Social Cognitive Theory would emphasize the opposite strategy by making people understand what they are able to change. Resource communication might be met with more acceptance. Individuals should not only be threatened by what they may lose, but they should also be challenged by what they could gain.

8.0 References


Figure Captions

*Figure 1.* The Health Action Process Approach.

*Figure 2.* LISREL-model to predict healthy eating behaviour: Subsample of men (n = 353). The paths from risk perception to positive outcome expectancy, from risk perception to intention, and from negative outcome expectancy to intention were also specified, but turned out to be not significant. Positive and negative outcome expectancies were correlated with .15.

* indicates path coefficient significant at p < .05, ** p < .01.

Experimental manipulations of self-efficacy suggest that efficacy can be enhanced and that this enhancement is related to subsequent health behavior change. The findings from these studies also suggest methods for modifying health practices. These methods diverge from many of the current, traditional methods for changing health practices. Recommendations for incorporating the enhancement of self-efficacy into health behavior change programs are made in light of the reviewed findings. INTRODUCTION. Bandura’s Social Learning Theory attempts to predict and explain behavior using several key conce