



Social differences in health behaviour: the  
motivational role of perceived control and coping

Anette Christine Iversen

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Research Centre for Health Promotion  
Department of Education and Health Promotion  
Faculty of Psychology  
University of Bergen  
Norway

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## SUMMARY

Social economic inequalities in health have been documented in most European countries including Norway. While the components of socio-economic status (SES) occupation, income and education may each have a unique effect on health through different mechanisms, there is concern that an increased discrepancy between social economic groups on health-related behaviours will lead to an increased discrepancy in health between social economic groups in the future. In a social cognitive perspective, SES is considered to influence health behaviour through social cognitive processes. The main aim of this thesis was to study the relationship between educational level (as a component of SES) and psychosocial factors such as perceived control and coping in relation to health behaviour.

The following five main research questions were addressed:

1. What is the relationship between educational level and perceived control?
2. How does perceived control predict one's intention to engage in health behaviour (i.e. smoking cessation and consumption of fruit and vegetables)?
3. To what extent does perceived control mediate the relationship between educational level and intention, and educational level and health behaviour (i.e. fruit/vegetable consumption)?
4. Is educational level related to the use of different coping strategies when one is exposed to health related messages?
5. What are the motivational, behavioural and emotional consequences of these coping strategies?



## Method

The thesis is based on data from three different studies carried out in Norway. Study 1 was a cross-sectional survey directed by the Norwegian Council on Tobacco and Health in November 1995 (survey response rate of 71%). The sample consisted of 421 respondents aged 16-79 (49.4% males, 50.6% females) who replied that they smoked daily. Study 2 was a cross-sectional survey carried out as part of a larger project on injury prevention among adolescents from two counties in Western Norway during December 1993 and January 1994 (survey response rate of 63%). The sample consisted of 1576 18-year old adolescents (52.2% females and 47.8% males). Study 3 was a two wave survey carried out among 45-year-old women residing in the city of Bergen in 1999. The sample consisted of 403 women who responded to the first questionnaire (response rate of 50.8 %), with 329 (81.6 %) of them (41.5 % of the total sample) also responding to a follow-up questionnaire. Data from study 1 and 2 are presented in paper I, data from study 3 is presented in paper II and III.

## Main results

Women with higher education levels reported higher general self-efficacy (GSE) (study 1 and study 3), and GSE was also positively related to educational aspirations (study 2). Higher educated women also believed less that chance/fate influenced health (study 3). General beliefs of control were related to higher perceived control in regards to specific health behaviours. Hence, GSE was positively related to confidence in quitting smoking (study 1), the belief that one can avoid injury risk (study 2), and the belief that one is capable of consuming fruits/vegetables at least three times daily (study 3). Along the same line, the belief that health is influenced by one's own behaviour was positively related to the belief that fruit and vegetable consumption can promote health and diminish illness.

As well, the belief in chance or fate was negatively related to beliefs about the health benefits of fruit and vegetable consumption (study 3). Behaviour specific control beliefs were more strongly related to specific intentions than were general control beliefs.

Women with higher levels of education had stronger intentions of consuming fruits/vegetables at least three times daily, and also reported higher consumption four weeks later. The positive relationship between level of education and subsequent behaviour was mediated by intention, while the effect of educational level upon intention was only partially mediated through control beliefs (study 3).

Women with lower levels of education reported more non-adaptive coping when exposed to health messages (denial, mental and behavioural disengagement), while no significant relationship was observed between level of education and adaptive coping. Non-adaptive coping was negatively correlated with behavioural intentions (fruit/vegetable consumption and physical exercise) while adaptive coping was positively correlated. Non-adaptive coping was also positively related to negative emotions.

## Conclusions

The results indicate that there is a tendency for women with lower levels of education to have lower perceived control, weaker self-efficacy beliefs and a stronger belief that fate/chance influences health. These control beliefs partially mediated the relationship between level of education and intention to consume fruits and vegetables. Further research on educational differences should include several health-related behaviours, and should explore the possible mediating effect of other social cognitive variables along with non-cognitive factors. Women with lower education also seemed to engage in more non-

adaptive coping with regards to health related messages. This tendency to avoid health related messages should be looked at as this type of coping seems to have both negative emotional and behavioural consequences and could possibly contribute to increasing differences in health related behaviours between social economic groups.

## LIST OF PAPERS

## Paper I

Leganger, A., Kraft, P., & Røysamb, E. (2000) Perceived self-efficacy in health behaviour research: Conceptualization, measurement and correlates. Psychology and Health, 15, 51-69.

## Paper II

Leganger, A., & Kraft, P. (2003) Control construct: Do they mediate the relationship between educational attainment and health behaviour? Journal of Health Psychology, 8(3), 361-372.

## Paper III

Iversen, A. C. & Kraft, P. (2004) Coping with health related messages: The role of educational level and health consciousness. (submitted)



## 1 INTRODUCTION

### 1.1 Background and aims of the study

Many of today's diseases are linked to health behaviour and lifestyle factors (Stroebe, 2000). This is especially true for cancer and coronary heart disease, which are the main causes of death in the Norwegian population (Stortingsmelding 16, 2002-2003). It is estimated that approximately two-third of all cancer cases are influenced by health behaviour and lifestyle factors. Smoking is the single most important risk factor of cancer, accounting for approximately 30% of all cases in the industrialized world. In Norway, it is estimated that 4300 deaths from coronary heart disease per year are due to smoking. The National Board for Nutrition and Physical Activity has calculated that regular physical activity may reduce the number of cancer cases by 7-8% and that it is possible that the number of people suffering from high blood pressure can be reduced by 75%. It is also estimated that a 65% increase in the consumption of fruits/vegetables would lead to a reduction in cancer rates by 20- 24% (Statens ernæringsråd, 1998).

During the last few decades, health authorities in Norway and other countries have made recommendations regarding diet, physical activity and smoking cessation. There has been an increased focus in the media on the potential impact of health behaviours on the prevention of future life threatening diseases such as cancer and coronary heart disease (Atkin & Atkin, 1990; Bandura, 1997; Hunt, Nichols, & Pryer, 2000; Russell, 1993). The rationale for targeting health behaviours is that health authorities will prioritize diseases that: a.) represent a major health problem, b.) are of high cost to the society, c.) have a known aetiology (risk and protective factors) and d.) are open to influence by preventive strategies (Stortingsmelding16, 2002-2003).

While people have been exposed to health education and mass media campaigns that encourage them to take responsibility for their health by adopting healthy behaviours, these campaigns seem to have been most effective for people with higher education levels. For example, Serdula (1995) reported that while only 17.4% of women with less than a high school education consumed five fruits/vegetables a day, 27.8% of women with a college degree did the same. In Norway, data from 2000-01 shows that 42% of adults with the lowest level of education were daily smokers, while only 18 % of adults with a university/college education were daily smokers. Hence, the main reduction in smoking prevalence has been among those with the highest level of education (Sosial- og helsedirektoratet, 2003; Stortingsmelding 16, 2002-2003)

A second public health concern is physical inactivity. It is estimated that the level of physical activity in approximately 50% of the Norwegian population is low and will cause negative health consequences. As for smoking, physical inactivity also has a social gradient (Stortingsmelding16, 2002-2003). In this respect, Vaage (1999) reported that 40% of those with the lowest level of education were physically inactive , while only 20% of those with higher levels of education were. The increasing discrepancy between social economic groups on health related behaviours (e.g. smoking, exercise, diet) has caused a concern for increased discrepancy in health in the future. Therefore, interventions that target lifestyle and health behaviour should take social inequalities into account(Stortingsmelding 16, 2002-2003).

Social inequalities in health have been documented in most European countries including Norway. Inequalities have been reported for different social economic indicators (SES) including income, education and occupation; for socio-demographic variables such as

geographical area, civil status and gender; and for different health indicators such as mortality, specific diseases and self-reported physical and psychological health (Carroll, Bennett, & Smith, 1996; Cohen, Kaplan, & Salonen, 1999; Lund, 2000; Marmot & Smith, 1997). In Norway, Krokstad & Westin (2001) reported a consistent pattern among men in Nord-Trøndelag county between socio-economic status and self-rated health, temporary disability, long-standing health problems and chronic conditions. Additionally, Lund (2000) showed that higher income was associated with better self-rated physical and psychological health among middle aged women, while there was a negative relationship between income and specific diseases such as hypertension and diabetes.

A number of different explanations for the relationship between SES and health have been proposed, such as access to health service, health behaviour and lifestyle, stress and coping (for an overview see Elstad, 2000). While materialistic/structuralistic explanations have tended to emphasize the external environment and the conditions under which people live and work (Fein, 1995; Stronks, vandeMheen, Looman, & Mackenbach, 1996), behavioural explanations have tended to put the responsibility on individuals and focus on “the way individuals from various social groups *chose* to lead their lives, particularly the behaviour and voluntary lifestyles they adopt” (Pill, Peters, & Robling, 1995p 28). Hence, different explanations have resulted in attributing inequalities in health to different reasons (Elstad, 2000; Fein, 1995). Recently, most researchers have acknowledged many pathways through which SES influences health status (Elstad, 2000). In the “new” perspective of social causation, health is influenced by the clustering of factors. Although each factor in itself may only have a small impact, together they may cause a substantial health disadvantage (Adler et al., 1994; Carroll, Bennett, & Smith, 1993; Carroll et al., 1996). Within this perspective, Adler et al. (1994) suggest that health is a reflection of the fact that income,



education and occupation shape one's life course and are enmeshed in key domains of life such as physical environment (e.g. living conditions, exposure to environmental hazards), social environment (e.g. strain and social support), psychological development, mood, cognition and health behaviours (Adler et al., 1994).

Among the psycho-social factors, several researcher have suggested perceived control as a possible mediating variable in the SES-health relationship (Carroll et al., 1993; Taylor & Seeman, 1999). Perceived control is related positively to health outcomes such as self-rated health and life satisfaction, and negatively to physical and depressive symptoms (Bailis, Segall, Mahon, Chipperfield, & Dunn, 2001; Cohen et al., 1999; Lachman & Weaver, 1998; Taylor & Seeman, 1999). Peterson & Stunkard (1989) have suggested that the positive relationship between perceived control and health could result from the fact that one's sense of control is related to better health behaviour and lifestyle. However, there are few studies that have examined this empirically. Hence, Taylor & Seeman (1999) have suggested a clear need for research addressing the antecedents of perceived control, distribution by SES and its relation to health outcomes. This thesis will focus on the relationship between educational level (as a component of SES), perceived control and health behaviour.

Most (contemporary) health behaviour theories include aspects of perceived control as determinants of health behaviour (Bandura, 1997; Conner & Norman, 1996; Rutter & Quine, 1994). People who believe that they have "control" over their lives are more likely to engage in health promoting behaviours and less likely to engage in health-compromising ones (Norman, Bennett, Smith, & Murphy, 1998; Peterson & Stunkard, 1989). However, a large number of labels and definitions of control have been used including self-efficacy,

mastery, locus of control, personal control and perceived control. Several researchers have argued that the heterogeneity among these constructs and the lack of clarity is problematic (Skinner, 1996; Wallston, Wallston, Smith, & Dobbins, 1987). Adler et al (1994) has suggested a need for different ways to conceptualize control in order to reveal more about the mechanisms through which perceived control influences health and health behaviour. Hence, this thesis aimed to study the relationship between different aspects of control and intention and health behaviour. This issue is addressed in Paper II.

Many of the social cognition models were developed to account for socio-demographic variations in health behaviours (Armitage & Conner, 2000; Conner & Norman, 1996). The assumption is that the effect of “distal” variables (i.e. socio-economic status) will be mediated through social cognition variables (Armitage, Norman, & Conner, 2002; Brug, Lechner, & Devries, 1995; Conner & Norman, 1996; Rutter & Quine, 1994). In general, for a variable or groups of variables to function as mediator(s), a relationship should exist between the independent variable (education) and the mediating variable (social cognitive variables), as well as between the mediating variable and the dependent variable (health behaviour) (see Baron & Kenny, 1986). However, while most research has been concerned with the relationship between social cognitive variables and health behaviours (Conner & Norman, 1996; Schwarzer, 1992), the relationship between social economic variables (such as educational level) and social cognitive variables has received less attention. As for the whole "causal" chain between education, social cognitive mediators and health behaviour, this seems to have only been the topic in a very limited number of research articles. Consequently, this thesis also aimed to study the possible mediating role of control beliefs. In Paper II, the purpose was to test the possible causal chain from educational level via control beliefs, and upon intention and health behaviour.

Finally, Parrott (1995) suggested that people seem to develop habitual or automatic ways of responding to (or coping with) health information. Prevention programs and health information often focus on the potential for health behaviours (e.g. smoking cessation and increasing physical exercise) to prevent future life threatening diseases (e.g. cancer and coronary heart disease). Despite not explicitly mentioning threatening information, such messages can evoke a feeling of threat, which may lead to activation of coping strategies (Rogers & Prentice-Dunn, 1997). In a health promotion perspective, the intended adaptive way of coping is to adopt the recommended behaviour. However, since many people do not cope in the adaptive recommended way, Ripptoe & Rogers (1987) have suggested a need to better understand how people cope when they do not intend to adopt the recommended behaviour. In this respect, Taylor & Seeman(1999) have suggested that non-adaptive coping mechanisms such as avoidance, denial of the problem or turning ones attention away from the issue, seem to be more utilized by people with lower socio-economic status. Such coping strategies may have negative consequences both behaviourally and emotionally. Since people with higher levels of education tend to follow public recommendations for health behaviour more than those with lower levels of education do, it brings up an interesting question of whether people with high/low education have developed different ways of coping with health related messages. Hence another aim of the present thesis was to study the relationship between one's level of education and adaptive and non-adaptive coping preferences in regards to health related messages, as well as the emotional and behavioural consequences of coping. These issues are addressed in Paper III.

## 1.2 Concepts and perspectives

### 1.2.1 Socioeconomic status

Social economic status (SES) is a composite measure that typically incorporates income, education and occupation (Adler et al., 1994). The term SES is often used interchangeably with social class (Chamberlain & O'Neill, 1998; Marmot, Ryff, Bumpass, Shipley, & Marks, 1997). However, while social class is a sociological concept (Arntzen, 2002), social economic status is an empirical measure (Fein, 1995). There are a number of different ways to measure SES. While some studies use a combination of two or three indicators (e.g. weighted index of income and occupation) (Chamberlain & O'Neill, 1998), others use only one indicator such as employment status (Sadava, O'Connor, & McCreary, 2000), household income (Lachman & Weaver, 1998; Lund, 2000), occupation (Pill et al., 1995) or education (Janssen, De Wit, Stroebe, & van Griensven, 2000). Often the indicators are used interchangeably with little attention paid to what aspects of SES have a major impact (Arntzen, 2002; Sadava et al., 2000). Adler et al.(1994) argue that the relationship between SES and health can be explained by *components* of SES which influence various domains in life. Hence, occupation, income and education may each have a unique effect on health through different mechanisms. With respect to health behaviour, social cognition and coping, several authors have suggested that educational level is the most important SES component (Arntzen, 2002; Miech & Hauser, 2001; Pill et al., 1995; Steptoe & Wardle, 1999).

### 1.2.2 Health behaviour

Health behaviour is a common term in health psychology and can simply be understood as behaviours that influence health (Conner & Norman, 1996). While it might be argued that almost all human activity is related in some way to health and illness, it is also a fact that

some types of behaviour are more closely related to health than others (Gochman, 1997). Examples of such behaviours include smoking, physical activity and nutrition/diet, which are the focus in this thesis.

According to a definition by Kasl and Cobb, 1966 (cited in: Conner & Norman, 1996) health behaviours are those behaviours performed by healthy individuals with the intent of preventing or detecting disease. This definition has several limitations. First it excludes people who are not healthy and would also benefit from changing health behaviour; second, it has a focus on disease instead of health; and third, it includes only behaviours performed intentionally (Conner & Norman, 1996). More recent definitions of health behaviour seem to reflect a general change in emphasis from the consideration of health as merely absence of disease to the positive aspects of health (Stroebe, 2000). Gochman (1997) describes health behaviour in a way that reflects health as resource rather than simply the absence of disease. Hence, health behaviours are overt behaviour patterns, actions and habits that relate to health maintenance, health restoration or health improvement. Along the same line, Stroebe (2000) describes health behaviours as behaviours either undertaken by individuals to enhance or maintain their health or as that have been shown to have beneficial health consequences.

Health behaviours can be divided into different sub-categories such as health enhancing/promoting behaviours and health threatening behaviours (Conner & Norman, 1996).

Some behaviours such as vaccinations, breast self-examinations, screening attendance and condom use are mainly performed to avoid disease or detect it at an early phase. Other types of behaviour such as physical activity, food choice and alcohol use may be performed for both health reasons and non-health reasons. The performance of health

behaviours is influenced by multiple external and internal factors (Conner & Norman, 1996; Steptoe & Wardle, 2001). Examples of external factors include culture, taxation on tobacco and alcohol, prices/availability of fresh fruits and vegetables, bicycle paths, green areas, smoking regulations and employer subsidized sport/exercise facilities. Examples of internal factors include attitudes, perceived control and subjective norms. Such cognitive factors are regarded as the most proximal determinants of health behaviours. Social cognitive factors are assumed to be important determinants of health behaviour and are regarded as more open to change than other variables. Thus, these variables are often targets for health promotion programs.

### 1.2.3 Social cognition models and theories

While there exists a number of different social cognitive models and theories of health behaviour, there is also considerable overlap among the various models and theories (Armitage & Conner, 2000; Conner & Norman, 1996). This overlap includes: a.) They represent people's *subjective perception* of reality rather than the objective world (Conner & Norman, 1996; Fiske & Taylor, 1991), b.) they are designed to predict behaviour at single points in time (Armitage & Conner, 2000), c.) they consider behavioural intention to be the strongest and most proximal predictor of behaviour (Armitage & Conner, 2000; Conner & Norman, 1996; Rutter & Quine, 2002) and d.) they suggest that perceived control is an important determinant of health behaviour (Armitage & Conner, 2000; Conner & Norman, 1996; Paxton & Sculthorpe, 1999; Rutter & Quine, 1994). The main focus of this thesis is on perceived control and coping, with the most relevant theories and models being health locus of control (HLC), theory of planned behaviour (TPB), protection motivation theory (PMT) and social cognitive theory (SCT).

Health Locus of Control (HLC) (Wallston & Wallston, 1981) may be perceived as a domain-specific control belief regarding health outcomes. The multi-dimensional HLC-scales (MHLC) measure health-specific locus of control along three dimensions: internal refers to beliefs that one's own behaviour determines health outcomes, chance is the belief that health outcomes are determined by chance or fate, and powerful others is the belief that powerful others (i.e. health professionals) control one's health (Norman & Bennett, 1996; Wallston & Wallston, 1981). The main prediction from HLC theory is that those with high internal control are more likely to engage in health promoting behaviours, while those with elevated HLC-chance beliefs are less likely to (Norman & Bennett, 1996; Stepoe & Wardle, 2001). Research on the relationship between HLC and the performance of specific health behaviours has shown only weak correlations (Ajzen, 1988; Norman & Bennett, 1996; Norman, Bennett, Smith, & Murphy, 1997; Wallston & Wallston, 1981).

The weak relationship between HLC and the performance of specific behaviours may be partly explained by the principle of compatibility (Ajzen & Fishbein, 1974). The more correspondence there is between disposition and behavioural indicators, the stronger the relationship is expected to be. It follows from this that a specific behaviour will be better predicted by specific beliefs toward that behaviour (Ajzen, 1988). In this respect, Ajzen (1988) has suggested that rather than regarding HLC as a disposition to act in certain ways, it could be considered as a disposition to hold certain beliefs (Ajzen, 1988).

In the theory of planned behaviour (TPB)(Ajzen, 1988), behavioural intention is considered to be the most proximal predictor of behaviour. Intention is viewed as a decision and commitment to act (Rutter & Quine, 2002). In the TPB, intention is influenced by attitudes, perceived behavioural control (PBC) and subjective norms.

Attitude towards the behaviour is a function of people's salient *beliefs* which represent *perceived* consequences of the behaviour, while perceived behavioural control (PBC) is one's perception of how difficult the behaviour is to perform. Many researchers have regarded PBC to be equivalent with self-efficacy and thus have proposed that PBC should be replaced by self-efficacy (Schwarzer, 1992). Lastly, subjective norms consist of a person's beliefs about whether significant others think you should engage in the behaviour.

Within social cognitive theory (SCT), the likelihood that a person will adopt valued health behaviour or change an unhealthy behaviour is considered to be related to self-efficacy and outcome expectancies (Schwarzer & Fuchs, 1996). Self-efficacy, or the belief that one can perform the recommended behaviour, is considered to be the most important factor for behavioural change. Outcome expectancies are beliefs about the consequences of performing the behaviour or not. In SCT, outcome- expectancies may be social, physical and self-evaluative. In health behaviour research the physical outcome-expectancies usually refers to positive health consequences of performing a behaviour.

Protection motivation theory (PMT) was originally developed to understand the effect of fear appeals but has since been regarded as a general theory of persuasive communication (Boer & Seydel, 1996; Rogers & Prentice-Dunn, 1997). Rogers & Prentice-Dunn (1997) argue that prevention programs and health information may evoke a feeling of threat even if threatening information is not explicitly mentioned. According to Schwarzer (1992), a minimum level of threat or concern must exist in order for people to start thinking about changing their health behaviours. PMT describes the cognitive processes that may result from different sources of information. These processes may be initiated by external events such as hearing health related news and observing other people become ill. At the



individual level, the cognitive processes may be related to the person's characteristics including health consciousness or prior experience with health threats. According to PMT, the cognitive processes that are initiated are appraisals of the threat and coping possibilities. In threat appraisal, the maladaptive response (e.g. smoking) is evaluated with respect to both the likelihood of experiencing a threat (e.g. lung cancer) and the severity of the threat (fatal disease). In coping appraisal, one evaluates one's ability to cope with the danger. The major predictors of motivation to protect oneself in an adaptive way are self-efficacy (the belief that one can perform an adaptive response such as smoking cessation) and response-efficacy (the belief that the recommended response will be effective in reducing a danger (as in a decrease in the risk of lung cancer)). Intention to perform the recommended response is assumed to be the best measure of motivation to protect oneself from a health threat (Rogers & Prentice-Dunn, 1997).

#### 1.2.4 Perceived control

Perceived control (PC) "is an individual's belief about how much they think they can control or influence their outcomes" (Taylor & Seeman, 1999 p 211). Perceived control is positively related to self-rated health and life satisfaction and negatively related to physical symptoms and depression (Bailis et al., 2001; Cohen et al., 1999; Lachman & Weaver, 1998; Taylor & Seeman, 1999). Perceived control is often used in a generic sense and a variety of distinguishable control constructs exists. Several researchers view the lack of clarity and the variety of definitions and labels as problematic (Skinner, 1996; Wallston et al., 1987). Some of the most frequently used concepts are locus of control, self-efficacy and mastery (Pearlin & Pioli, 2003; Peterson & Stunkard, 1989; Skinner, 1996; Taylor & Seeman, 1999; Wallston et al., 1987). These are also the most relevant for this thesis.

Locus of control refers to the general expected relationship between one's actions and outcomes. Locus of control beliefs can be generalized or domain specific [i.e. health locus of control (HLC)](Pearlin & Pioli, 2003). People are said to have internal locus of control when they believe that outcomes and events can be influenced by their own actions. HLC is usually measured by the Health locus of control scales (Wallston & Wallston, 1981). Internal HLC is measured by items such as "The main thing that affects my health is what I myself do" and "If I take care of myself I can avoid illness". Internal locus of control does not imply that the actor perceives that he/she is able to perform the actions, but rather that personal behaviour causes the expected outcomes.

Mastery ( also personal mastery, self-mastery) refers to whether one regards life occurrences as being under personal or fatalistic control (Ben-Zur, 2002; Pearlin & Schooler, 1978). Although mastery is not addressed in this thesis, it is a global construct that seems to overlap with general self-efficacy. Mastery is usually measured by a 7-item scale developed by Pearlin & Schooler (1978) that includes "I have little control over the things that happen to me" and " I can do just about anything I set my mind to". Mastery seems to include both the belief about the influence of one's own action on outcomes (as locus of control) and also the belief in one's ability to perform the necessary behaviours.

Perceived self-efficacy refers to "beliefs in one's capabilities to organize and execute the course of action required to produce given attainments" (Bandura, 1997p 3). When self-efficacy was first introduced by Bandura (1977), it was as a behaviour or task specific belief , and later was also developed at the domain and global level. There is no standard scale for measuring self-efficacy beliefs, and many self-efficacy scales and items exist. The general self-efficacy scale (Schwarzer, 1993) consists of ten items which assess the

strength of an one's belief in his/her ability to respond to new or difficult situations and/or to deal with any associated obstacles or setbacks (e.g. "I can solve most problems if I invest the necessary effort"). The main advantage of using self-efficacy is that it is a concept embedded in social cognitive theory. This theory explains the origin, structure, functioning and effect of self-efficacy beliefs (Bandura, 1997).

### 1.2.5 Self-efficacy

Self-efficacy is a core construct in social cognitive theory (Bandura, 1986) and represents an "I can do" cognition. It is not concerned with the number of skills one possesses, but rather, is a belief about what you can do with the skills you have. People who believe "they can do" tend to set more ambitious goals for themselves, put forth more effort and be more persistent when facing difficulties (Schwarzer & Fuchs, 1996). In contrast, those who doubt their capabilities tend to set less ambitious goals, invest less effort and give up more easily when facing difficulties. Consequently, while people may be very talented and have good abilities, they still may not reach their potential if they have low self-efficacy (Bandura, 1997). In contrast, people with ordinary skills and abilities and a strong sense of self-efficacy may achieve high goals. Optimal functioning requires skills as well as the efficacy belief to use them well (Bandura, 1997).

People with high self-efficacy are seen as anticipative and proactive, regulating their own motivation and actions (Bandura & Locke, 2003). Bandura & Locke (2003) argue that personal efficacy is the core belief that motivates people to take action. People with strong self-efficacy beliefs approach difficult tasks as challenges to master rather than threats to avoid (Bandura, 1997). Individuals who strongly feel that they can impact their world are going to feel empowered and capable of making effective and lasting changes in their

lives. People with high self-efficacy act proactively, identify opportunities and act on them. Examples of proactive behaviours include health related practices such as diet and exercise, as well as the establishment of a social network and social supports (Aspinwall & Taylor, 1997).

#### 1.2.5.1 Sources of self-efficacy

Self-efficacy (SE) is a belief system that can be acquired or influenced by four main sources: personal experience, vicarious learning, verbal persuasion and physiological feedback (Bandura, 1995). The strongest influence on self-efficacy beliefs is personal experience of success at a task. Vicarious learning implies that seeing others perform a behaviour successfully strengthens self-efficacy beliefs. The influence is stronger if the other person is viewed as similar. SE can also be influenced by verbal persuasion, meaning people can convince you that “you can do it”. Finally, people’s judgement of their self-efficacy may be influenced by their physiological condition. Therefore, if people are anxious, tired or depressed, they may underestimate their self-efficacy (Bandura, 1997).

It is, however, important to bear in mind that none of these sources automatically affect self-efficacy beliefs, but rather that they are impacted by how the information is selected, weighted and integrated by the individual (Bandura, 1997). Likewise, the way people filter, interpret and understand information is influenced by pre-existing beliefs and expectations (Gochman, 1997). Consequently, pre-existing self-schemata tend to bias the cognitive processing of efficacy information that contributes to their stability (Bandura, 1997). Hence, people with high self-efficacy tend to attribute the cause of success to personal characteristics and qualities. This tendency to interpret information in a way that is consistent with one’s pre-existing view of him/herself is known as the consistency motive

(Brown, 1998). It follows from this that the same success or failure experience may impact people differently depending on their pre-existing expectancies. Whether a performance influences self-efficacy beliefs or not depends upon how a person attributes the cause of a success or failure. Only when people attribute the cause to themselves does success/failure influence self-efficacy beliefs. For example, if failure to quit smoking is attributed to an external cause such as “there was so much stress in my life”, the experience may not influence self-efficacy beliefs negatively. On the contrary, if the failure is attributed to a stable internal cause such as “I failed because I am a person of low willpower”, then it would negatively influence self efficacy beliefs. This tendency to interpret information in a way that is consistent with pre-existing beliefs and expectations does not imply that self-efficacy beliefs cannot be influenced; rather it means that the same experience may have different effects on people with high vs. low self-efficacy. Consequently, people with low self-efficacy beliefs may need stronger influences to increase their self-efficacy than people with higher self-efficacy.

Gecas & Schwalbe (1983) argue that the opportunity to engage in efficacious action is related to one’s social position. It is also likely that other sources of self-efficacy beliefs (i.e. vicarious learning and verbal persuasion) are linked to people’s social position. Thus, the school and the family are important arenas for building self-efficacy beliefs. Within social cognitive theory, people’s behaviour is best understood within the triad of the person, behaviour and environment, the concept of reciprocal determinism refers to the fact that all three influence each other (Bandura, 1986, 1997). Hence, while self-efficacy theory emphasize the person as an active agent, the impact of the social economic environment on people's self-efficacy beliefs and behaviours are also acknowledged.

### 1.2.5.2 Generality of self-efficacy beliefs

A common misconception is that self-efficacy is only concerned with specific behaviours in specific situations (Bandura, 1997). It is possible to think about self-efficacy at three broad levels of generality. The first and most specific level is belief in one capability to perform a specific behaviour in a specific situation. Next, self-efficacy can also be conceptualized at a domain level representing belief in one's capability to perform various behaviours within a certain domain [i.e. social self-efficacy (Sherer et al., 1982), academic self-efficacy (Lent, Brown, & Gore, 1997), risk-handling self-efficacy (Røysamb, 1997)]. Lastly, several authors have also conceptualized self-efficacy as a more general construct without reference to any specific domain (Schwarzer, 1993; Shelton, 1990; Sherer et al., 1982) as the belief of being able to master challenging demands through adaptive action (Schrøder, Schwarzer, & Konertz, 1998). Some authors have argued that general beliefs of self-efficacy may be one source of information used when people judge their specific self-efficacy in relation to a specific task (Shelton, 1990; Watt & Martin, 1994). Along the same line, Bandura (1997) has suggested that people's appraisal of their efficacy in a specific domain is partly based on how they judge their general self-regulatory capabilities.

### 1.2.5.3 Self-efficacy and health

Self-efficacy is related positively to life-satisfaction and health and negatively to loneliness, depression, anxiety and pessimism (Bandura, 1997; Schwarzer, 1993). According to Bandura (1995) there are two ways by which SE has a positive influence on health: through the effect on behaviour (the focus in this thesis) and by influencing how people confront stress in their lives. In this respect, self-efficacy is related to the tendency to view a stressful situation as more challenging than threatening and to use more active

than passive coping strategies (Jerusalem & Schwarzer, 1992; Schröder et al., 1998). This has been shown both in longitudinal and experimental studies (Jerusalem & Schwarzer, 1989; Jerusalem & Schwarzer, 1992). Schröder et al. (1998) reported that perceived self-efficacy was positively related to adaptive coping (seeking social support) among cardiac patients. In the area of occupational stress, Jex, Bliese, Buzzell, & Primeau (2001) reported that self-efficacy was correlated positively with active coping and negatively with passive coping. High self-efficacy was also negatively correlated with psychological strain.

The majority of relevant studies have found self-efficacy to play a central role in predicting health-related behaviour (Conner & Norman, 1996). Thus, self-efficacy has been incorporated into most health behaviour theories (Bandura, 1997; Conner & Norman, 1996). Self-efficacy is considered to be an important determinant of behavioural change because of its influence on the initial decision to engage in a behaviour (intention), the effort expended, and the persistence experienced when facing difficulties (Bandura, 1995, 1997). Hence, people with high self-efficacy beliefs are more likely to succeed at their efforts to change health behaviours, such as stopping smoking, performing regular exercise, etc.

### 1.2.6 Coping

Coping has to do with the responses executed when people perceive a situation as stressful. According to the theory by Lazarus and Folkman, any situation can be perceived as irrelevant, benign, positive or stressful. Appraisal of a situation as stressful involves the perception of a mismatch between demands and resources (Lazarus, 1993). Appraisal of a stressful situation as threatening involves the perception of possible future harm. Coping consists of the behavioural and cognitive strategies people use to minimize the impact of

the threat (Pearlin & Schooler, 1978; Schafer, Schafer, Bultena, & Hoiberg, 1993). There exists a large number of strategies people may use when they are under stress, but there is little consensus regarding the number of strategies and how they should be labelled (De Ridder, 1997). However, most researchers seem to agree that coping can be classified into two broader dimensions and use a number of different labels to name these dimensions, such as problem versus emotion-focused coping, approach versus avoidance, and active versus passive coping (De Ridder, 1997). Coping has been studied in relation to various health related stressors [e.g. recovery from heart disease (Schrøder et al., 1998) and breast cancer (Ben-Zur, Gilbar, & Lev, 2001)] as well as non-health issues such as having an exam (Carver & Scheier, 1994). A few studies have also looked at coping perspective in relation to health related messages (Ripptoe & Rogers, 1987; Schafer et al., 1993; Self & Rogers, 1990).

Some researchers view coping as a general disposition to respond in a certain way across different situations and stressors (trait), while others view it as a process that changes over time, situations and contexts (state) (Carver & Scheier, 1994; Lazarus, 1993). This thesis is based on an intermediate view that although people may respond differently to problems involving family, work or health, they may also develop habitual ways of dealing with specific stressors such as health related messages.

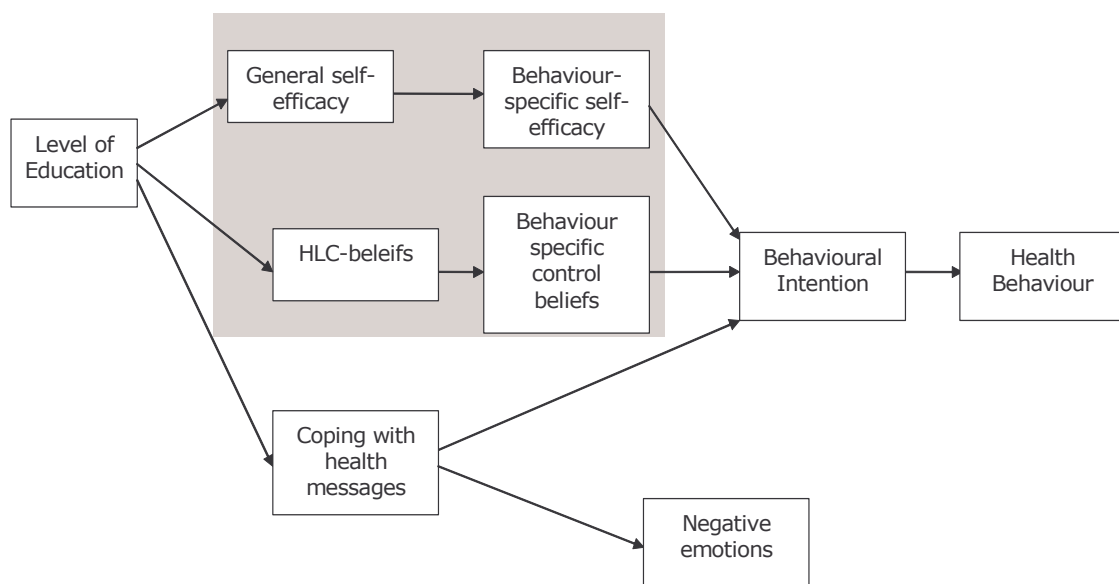
### 1.3 Research questions

The overall aim of the present research was to study the possible role of perceived control and coping with health related messages as it relates to educational differences in health behaviours. An overview of the research framework is given in Figure 1. The aims were to study: a) the relationship between educational level and perceived control, b) the



relationship between different conceptualizations of control (both at a general and behaviour specific level) and behavioural intentions (smoking cessation and consumption of fruits and vegetables), c) the possible causal chain upon intention and health behaviour from educational level via control beliefs, d) the relationship between level of education and adaptive/non-adaptive coping in relation to health related messages and e) the effect of coping on behavioural intention (exercise and fruits/vegetable consumption) and negative emotions.

Figure 1: Research framework



## 2 MATERIALS AND METHOD

### 2.1 Data collection and samples

This thesis uses data from three Norwegian surveys. Study 1 was a cross-sectional survey directed by the Norwegian Council on Tobacco and Health in November 1995. The survey was carried out as part of the national monitoring system of smoking. Sample selection, collection and coding of data were carried out by Statistics Norway. They selected a sample of 2000 people according to Statistic Norway's standard sampling system which is designed to ensure a representative sample of the adult Norwegian population aged 16-79 years. Of the original sample of 2000 people, 13 had died or moved to another country; hence the available original sample consisted of 1987 people. Interviews were carried out with 1411 people yielding a response rate of 71%. Every respondent answered the question "Do you smoke?" Their possible answers were "yes, daily", "yes, occasionally" and "no". 421 respondents (49.4% males, 50.6% females) replied that they smoked daily and subsequently comprise the material for this study.

Study 2 was a cross-sectional survey carried out as part of larger project on injury prevention among adolescents. Data collection was performed in two counties in Western Norway during December 1993 and January 1994. In the county of Sogn and Fjordane, the entire population of 18 year olds comprised the target sample, while in the second county, Møre and Romsdal, a target sample was drawn from the total population of 18 year old persons. Every person received a letter containing a questionnaire with a pre-addressed and pre-stamped return envelope. Two reminders were sent to non-respondents. Sampling, collection and registration of data was carried out by Statistics Norway. The final material consisted of 1576 18-year old adolescents (52.2% females and 47.8% males) (survey response rate of 63%).

Study 3 was a two wave survey especially carried out for this thesis. Data was collected by means of two mailed questionnaires sent four weeks apart. From the population of 45-year-old women residing in the city of Bergen, Norway, 800 women were sampled at random from the official population registry by the Norwegian National Population Registry. 793 of these women were available by mail and received a self-administered questionnaire along with a pre-addressed and stamped envelope. One reminder was sent to non-responders. Collection and registration of data was performed by the HEMIL-centre. The questionnaire included two pages with copies of health related messages obtained from Norwegian newspaper articles. The messages covered issues such as risk factors for cancer, possible health problems related to physical inactivity, and the benefits of increasing the consumption of fruits and vegetables. Four weeks later, the women who had responded to the first questionnaire received a follow-up questionnaire which mapped the frequency of exercise and fruit/vegetable consumption during the past four weeks. Again, one reminder was sent to non-responders. A total of 403 women responded to the first questionnaire (response rate of 50.8 %), with 329 (81.6 %) of them (41.5 % of the total sample) responding to the second questionnaire.

Table 1: Sample characteristics

<i>PAPER</i>	<i>Study</i>	<i>Sample</i>	<i>Year of data collection</i>	<i>Geographical area</i>	<i>Age</i>	<i>Response rate (%)</i>	<i>N</i>
I	1	Male and female smokers	1995	National sample	16-79	71	421
	2	Adolescents boys and girls	1993/1994	Sogn and Fjordane Møre and Romsdal	18	63	1576
II	3	Females	1999	Bergen	45	41.5	329
III	3	Females	1999	Bergen	45	50.8	403

## 2.2 Measures

### 2.2.1 SES and demographics

Educational level was used as an indicator of SES in the present study. Educational level is one component of socio-economic status and is considered by many authors to be the most powerful SES predictor of health and health behaviour (Miech & Hauser, 2001; Pill et al., 1995; Steptoe & Wardle, 1999). In Study 1, level of education was assessed on a three point scale: low = 9 years or less, medium = 10-12 years and high = 13 years or more. In Study 2, educational aspirations were assessed on a five point scale ranging from 1 (no education after secondary school), to 5 (more than four years at a university). In Study 3, educational level was assessed on a five point scale: (1) =< 9 years, (2) = 10-11 years, (3) = 12 years, (4) = 13-16 years and (5) => 17 years.

Age (year of birth) was assessed in Study 1. The sample in Study 2 consisted of 18-year-olds, while the sample in Study 3 consisted of 45-year olds. Gender was assessed in Studies 1 and 2, while the sample in Study 3 consisted of only women.

### 2.2.2 Perceived control

In all three studies, General self-efficacy was measured by a Norwegian version of the General Self-efficacy Scale (GSE) (Røysamb, Schwarzer, & Jerusalem, 1998; Schwarzer, 1993). The scale consists of ten items which assesses the strength of one's belief in his/her ability to respond to novel or difficult situations and to deal with any associated obstacles or setbacks. Responses were reported on a four point scale ranging from 1 (not at all true) to 4 (exactly true).

Smoking specific self-efficacy was measured in Study 1 by a single-item question assessing the subjective probability of succeeding given that an attempt to quit was made. Responses were reported on a seven-point scale ranging from 1 (I am sure I would fail if I tried), to 7 (I am sure I would succeed if I tried). Specific self-efficacy related to injury risk was measured in Study 2 by a two-item scale assessing the respondents' perceived efficacy in avoiding dangerous situations and adopting injury prevention safety measures. Responses were reported on a four-point scale similar to the GSE scale. Self-efficacy for consuming fruits/vegetables was assessed in Study 3 by asking subjects how confident they felt about consuming fruits/vegetables at least three times daily even in the face of three different barriers. Responses were reported on a five-point scale anchored by "disagree completely" and "agree completely".

A short version of the Health Locus of Control Scales (Norman & Bennett, 1996; Norman et al., 1997) was applied in Study 3 (Norwegian version translated by Aarø, 1986). "HLC-chance" and "HLC-internal" were each measured by three items reported on a six-point scale anchored by "strongly disagree" and "strongly agree". Behaviour specific control beliefs were assessed in Study 3 by three items related to the health consequences of fruit/vegetable consumption. Responses were reported on five point scales anchored by "very unlikely" and "very likely".

### 2.2.3 Coping

Coping with health related messages was assessed in Study 3 by asking subjects how they usually react when confronted with health messages that describe the relationship between health behaviours and the risk of developing cancer. Adaptive and non-adaptive coping responses were assessed by applying 16 items from the COPE instrument (Carver, Scheier,

& Weintraub, 1989) (Norwegian version have been translated by Vollrath, Torgersen, & Alnaes, 1998). Some of the items were slightly re-worded in order to specifically tap into more precise coping reactions related to health related messages. Adaptive coping was measured by the active and planning subscales from COPE (e.g. “I concentrate my efforts on doing something with my health habits” and “I make a plan of action to improve my health habits”). To represent non-adaptive coping, we included items from the denial, mental and behavioural disengagement scales (e.g. “I say to myself this isn’t true”, “I think about something else” and “I admit to myself that I can’t deal with it, and give up”). Responses were reported on a four-point scale ranging from “never” to “a lot”.

#### 2.2.4 Intention and behaviour

Intention of trying to stop smoking was only assessed in Study 1 by the item "How likely is it that you will try to give up smoking?" Responses were reported on a 7-point scale ranging from 1 (I will definitely not try to give up) to 7 “I will definitely try to give up”. Intention to consume fruits/vegetables was measured by using three items (e.g. “I intend to consume fruits/vegetables at least three times a day during the next four weeks). Each item was rated on a 5-point scale ranging from “very unlikely” to “very likely”. Intention to exercise was measured by three items in a similar way.

Fruit/vegetable consumption was assessed in Study 3 (follow up) by one question: “During the past four weeks, how often have you consumed fruits/vegetables?” Responses were reported on a six-point scale: (1) = seldom/never, (2) =1-2 times a week, (3) = 3-6 times a week, (4) = 1-2 times a day, (5) = 3-4 times a day and (6) = 5 or more times a day. In a similar way, exercise behaviour was measured by one question: “During the past four weeks, how often have you performed physical exercise?” Responses were reported on a

five point scale: (1) = have not exercised, (2) = 1-3 times the last four weeks, (3) = 1 time a week, (4) = 2 times a week, (5) = 3 or more times a week.

#### 2.2.5 Additional variables

In order to assess the construct validity of the GSE-scale, the following scales from Study 2 were applied: Positive Affect and Negative Affect Schedule (PANAS) (Watson, Clark, & Tellegen, 1988), Satisfaction With Life Scale (SWLS) (Diener, Emmons, Larsen, & Griffin, 1985), Sensation Seeking Scale 18 (Pedersen, Clausen, & Lavik, 1988) and The Multidimensional Health Locus of Control Scales (MHLC) (Wallston & Wallston, 1981).

Outcome expectancies related to smoking/not smoking were assessed in Study 2 by means of the Smoking Decisional Balance Scale (SDBS) (Velicer, DiClemente, Prochaska, & Brandenburg, 1985). Seven items related to the pros and another seven items related to the cons of smoking were included and responses were reported on a 5-point scale assessing the importance of a specific consequence for smoking or not-smoking. Attribution of failure to stop smoking at the most recent quit attempt was assessed in Study 1 by three questions representing three types of attributions: (a) internal, unstable; (b) external, unstable; and (c) internal stable. (a) I didn't succeed because I didn't try hard enough; (b) I didn't succeed because I used a wrong strategy, and; (c) I didn't succeed because I am a person with a weak willpower. Responses were reported on a 7-point scale ranging from 1 (disagree completely) to 7 (agree completely). Health consciousness was measured in Study 3 by applying a 9-item scale (Gould, 1990) (e.g. "I'm alert to changes in my health" and "I reflect about my health a lot"). The responses were measured on a 5-point scale anchored by "not at all typical" to "very typical". Experience of negative emotions in relation to health messages was measured in Study 3 by applying six items from the



Negative Affect Schedule (Watson et al., 1988): distressed, scared, irritable, ashamed, nervous, and afraid. Responses were reported on a five-point scale ranging from 1 (very slightly or not at all) to 5 (extremely).

### 2.3 Validity and reliability

General self-efficacy is a theoretical construct (latent variable), which is inferred from the individual's responses on the ten items of the GSE scale. Validity can be characterized as how appropriate, meaningful and useful specific inferences made from such tests or scales are (Pedhazur & Schmelkin, 1991). In order to assess the construct validity of the general self-efficacy scale, the point of departure was first a definition of the construct. The simplest way of estimating construct validity is Face-validity which is a "common sense" approach where one evaluates whether the items seem to reflect the underlying construct. Construct validity was further studied by examining how the scale correlated with other psychological states and traits in a meaningful way. Based on self-efficacy theory and previous research, it was hypothesized how GSE should relate to other variables such as attribution of failure, positive and negative affect, life satisfaction and specific self-efficacy.

Reliability is a necessary but not sufficient condition for validity (Pedhazur & Schmelkin, 1991). Reliability has to do with the precision of the instrument and the extent to which an instrument will produce the same result if applied two or more times (Tesser, 1995; Windsor, 1994). It follows from classical test theory that any measure is composed of a true score and random error, so reliability can be characterized as a theory of error.

Cronbach  $\alpha$  coefficients, which estimate the proportion of variance in a test score due to all

*common* factors among the items (Pedhazur & Schmelkin, 1991), was used to assess reliability of the scales used in this thesis.

#### 2.4 Statistical analyses

Basic statistical analyses were carried out by means of SPSS version 7.0 -11.0 (paper I-III), including frequency distributions, t-test, ANOVA, correlation and regression analyses. SPSS was also used for Principal component analysis (PCA), which was applied in Paper I on the GSE items and in Paper III on the 16 coping items in order to determine the number of factors to retain. Principal component analysis (PCA) represents one of several approaches that extracts underlying dimensions of variance and appears to be the most commonly applied procedure (Røysamb, 1997). The optimal number of factors was established by combining three criteria: (1) Kaisers eigenvalue rule which says that eigenvalues of the factors should be greater than 1, (2) the scree test and (3) the principle of parsimony.

Structural equation modelling was carried out by using Lisrel 8 (Jöreskog & Sörbom, 1993) in Paper I and AMOS 4 (Arbuckle & Wothke, 1995-99) in Papers II and III. In Paper I, confirmatory factor analyses were applied to test the fit of a one factor solution on the GSE scale. Path analysis was used to test the relationships between GSE, SSSE (smoking specific self-efficacy) and intention. When the purpose is to study multiple relationships including several mediating variables, path analyses with structural equation modelling is considered the most appropriate statistical method. In Paper II, we hypothesized and tested a structural model with observed variables using sum-scores. When using sum scores, the  $\beta$ - values obtained in a path-analysis are similar to the  $\beta$ - values that would be obtained from a series of regression analyses. A path analysis makes

it possible to test the model as a whole and estimates how well the data fits the hypothesized model. A disadvantage to using ordinary sum-scores is that it is unclear how much the relationships between variables are reduced by measurement error (Hankins, French, & Horne, 2000). In Paper III, the psychological variables were measured as latent constructs while educational level and behaviour at follow up was measured as observed variables. This combined model of latent and observed variables is sometimes referred to as a hybrid model (Kline, 1998). When latent factors are modelled, the importance of random measurement errors involved in ordinary sum-scores is reduced.

Model fit determines the degree to which a structural equation model fits the sample data. The different structural equation modelling programs provide a number of different fit-indexes. While there is no single test or absolute criteria for a good/bad model, there are recommended values on the different tests. The chi-square ( $\chi^2$ ), goodness of fit index (GFI), adjusted goodness of fit index (AGFI) and the root mean square (RMR) are based on differences between the observed and model-implied correlation or covariance matrix (Schumacker & Lomax, 1996). The  $\chi^2$  is the only test which has a statistical test of significance. A significant  $\chi^2$  indicates that the observed and estimated matrices differ. The  $\chi^2$  is sensitive to sample size and tends to be significant as sample size increases. However, a significant  $\chi^2$  does not necessarily indicate a poor fit. A  $\chi^2/df$  ratio of less than 3 may be considered favorable (Kline, 1998). The goodness of fit index (GFI) and adjusted goodness of fit index (AGFI) (in which the degrees of freedom are adjusted for) are based on a ratio of the squared differences between the observed and reproduced matrices and indicate the relative amount of variance and covariance accounted for by the model. The values can range from 0 (indicating no fit) to 1 (indicating perfect fit), and values above 0.90 indicate a good fit. The value of GFI is influenced by the number of parameters in the model; hence, complex models with many parameters tend to fit the data

better than simple ones. The AGFI adjusts for this by correcting the value downwards as the number of parameters increases (Kline, 1998).

The Normed fit index (NFI) and Comparative fit index (CFI) are incremental fit indexes that indicate the proportion of improvement in fit relative to a null (independence) model. Values close to .90 are considered a good fit and indicate that the fit of the researcher's model is 90% better than a null model (Kline, 1998; Schumacker & Lomax, 1996). The CFI is less affected by sample size. In AMOS, it is a well known problem that the fit indexes, which are based on a null (independence) model, tend to be inflated when there is missing data. This problem was resolved by using only cases with complete data in Paper II, and by specifying an unconstrained independence model in Paper III.

### 3 RESULTS

#### 3.1 Summary of Paper I

The purpose of the first paper was to study the psychometric properties and socio-demographic correlates of the General self-efficacy scale (GSE), the relationship between GSE and specific self-efficacy, and the relationship between self-efficacy and attribution of failure. The paper is based on data from two studies, a sample of 421 Norwegian daily smokers aged 16-79 years and a sample of 1576 Norwegian 18-year-olds. The results showed satisfactory factor structure, internal consistency and test-retest reliability of the GSE-scale. A one factor solution showed the best fit to the data. Internal consistency was satisfactory in both studies ( $\alpha = .82$  and  $.88$ ). The construct validity of GSE was also supported as GSE correlated positively with HLC-internal, positive affect, satisfaction with life and sensation seeking, and negatively with negative affect. The mean GSE score was 29.6 in the sample of daily smokers and 24.3 in the sample of adolescents. There were no significant gender differences in the sample of smokers while the mean for girls was significantly lower than that for boys in the adolescent sample. In the sample of smokers, there was a weak correlation between educational level and GSE among women, while there was no relationship among men. In the adolescent sample, GSE correlated positively with educational aspirations. Positive correlations were found between general and specific self-efficacy beliefs related to intention to quit smoking and avoid injury risk. GSE did not predict intention to quit smoking. In the regression analyses, intention to quit smoking was predicted by specific self-efficacy ( $\beta = 0.33$ ) and positive and negative outcome-expectancies ( $\beta = -0.15$  and  $0.28$ ). The model explained 27 % of the variance in intention. Among smokers who reported at least one attempt to quit smoking, both general and smoking specific self efficacy was negatively correlated with the tendency to attribute failure to internal stable cause (willpower).

### 3.2 Summary of Paper II

In this paper, the purpose was to study the relationship between educational level, intention and health behaviour (fruit/vegetable consumption); the relationship between educational level and control conceptualizations [health locus of control (HLC), response-efficacy and self-efficacy]; and the extent to which the relationship between educational level and intention/health behaviour (fruit/vegetable consumption) was mediated by control beliefs. The study was based on a sample of 329 women aged 45 years who participated in a two-wave data collection. There was a positive correlation between educational level and intention to consume fruits/vegetables and subsequent behaviour ( $r = .25$  and  $r = .32$ ;  $p < 0.001$ ). Educational level was positively associated with general self-efficacy beliefs ( $r = .21$ ;  $p < 0.001$ ), and negatively with HLC-chance ( $r = -.25$ ;  $p < 0.001$ ). Path analyses confirmed a causal chain from educational level upon intention and health behaviour via control beliefs. The model showed that the relationship between educational level and behavioural intention was partly mediated by control beliefs. The model provided an excellent fit to the data as revealed by the fit indices; a non-significant  $\chi^2$  (11 d.f.), a normed fit index (NFI) of .97, a goodness of fit index (GFI) of 0.99 and comparative fit index (CFI) of 0.99. The root mean square error of approximation (RMSEA) was 0.02. The model explained 28% of the variance in intention to consume fruits/vegetables and 44% of the variance in behaviour. The total effect of educational level upon behaviour was .32, the indirect effect was .15. The total effect of educational level upon intention was .24, and the indirect effect was .07. All the effects of the control constructs on behaviour were mediated through intention.

### 3.3 Summary of Paper III

The purpose was to study a) how people cope with health related messages; b) whether educational level and health consciousness (HC) were related to coping; c) the influence of coping on intention to engage in health promoting behaviours (exercise and fruit/vegetable consumption) and subsequent behaviour four weeks later; and d) the relationship between coping and negative emotions. The study was based on a two-wave survey among women aged 45 years. 403 women responded to the first questionnaire (response rate of 50.8 %), with 329 (81.6 %) of them (41.5 % of the total sample) responding to the follow-up questionnaire. Two scales, representing adaptive and non-adaptive coping, assessed coping with health messages. Overall, the women reported more use of adaptive than non-adaptive coping strategies. The results from the structural equation modelling showed that educational level predicted non-adaptive coping (beta = -.33), while health consciousness predicted adaptive coping (beta = .37). Non-adaptive coping predicted negative emotions (beta = .42), intention to consume fruits/vegetables (beta = -.29) and intention to exercise (beta = -.30), while adaptive coping predicted intentions (betas of .32 and .30, respectively). The total model provided an NFI of 0.95, a CFI of 0.98 and a RMSEA of 0.04. The results showed that there was a tendency for women with lower levels of education to engage in more non-adaptive coping in relation to health messages, and while this type of coping has a negative influence on intention to engage in health promoting behaviours, it increases the experience of negative emotions.

## 4 DISCUSSION

### 4.1 Educational level and perceived control

The overall aim of the present research was to study the possible role of perceived control and coping with health related messages in relation to educational differences in health behaviours. The results showed that there was a weak positive relationship between level of education and GSE for women, but not for men in the sample of smokers (Study 1, Paper I). In the sample of 45 year old women, level of education was significantly positively correlated with GSE (Paper II), while in the sample of adolescents; GSE was positively correlated with educational aspirations for both boys and girls (Study 2, Paper I). The positive relationship between GSE and educational aspirations indicates that, although higher educational attainment may increase people's efficacy beliefs, self-efficacy is also related to higher educational aspirations. This is in accordance with theory saying that self-efficacy should be related to higher goal setting and that the relationship between self-efficacy and behaviour is bi-directional. Positive relationships between level of education and perceived control have been reported for related concepts such as mastery (Bailis et al., 2001; Lachman & Weaver, 1998), perception of control over things that happen in one's life (Cohen et al., 1999), and general self-efficacy among men (Sherer et al., 1982).

Therefore, it is somewhat surprising that we did not find a significant relationship between general self-efficacy and level of education among men in study 1. This may have several explanations, including the sample was rather small, the sample consisted of only smokers, and the respondents were heterogeneous with respect to age (ranging from 16- 79 years).

In Paper II, we also studied the relationship between level of education and health locus of control. There was no significant association between educational level and HLC-internal. Hence, in the domain of health, the different educational groups did not differ in beliefs



regarding the extent to which their health was influenced by their own behaviour.

However, while acknowledging that health is influenced by personal behaviour, those with lower educational levels also had a more chance/fatalistic view on health and illness as indicated by the negative relationship between educational level and HLC-chance.

Although this may seem a bit strange, similar results have been reported previously (Paxton & Sculthorpe, 1999; Aarø, 1986).

The tendency for educational level to be positively related to self-efficacy and negatively to HLC-chance (fatalism) may reflect the fact that people with different levels of education have had different opportunities and experiences with influencing events that affect their lives (Clark, 1996; Lachman & Weaver, 1998). Skaff, Mullan, Fisher, & Chesla (2003) suggest that global sense of control builds upon a lifetime of experience, opportunities and challenges. In this respect, Taylor & Seeman (1999) have suggested that people with lower socio-economic status seem to develop more negative expectations for their goal attainments.

#### 4.2 General and specific control beliefs

Results from all three studies confirmed a positive relationship between general and specific self-efficacy beliefs (quitting smoking, avoiding injury risks and consuming fruits and vegetables). Although the magnitude of these correlations was not very strong, this corresponds well with the argument that people may integrate self-efficacy information from multiple sources such as vicarious learning, verbal persuasion, personal experience with the task, experiences with similar tasks and general self-regulatory capabilities (Bandura, 1997). The rules for weighing and integrating self-efficacy information from different sources may differ between both people in general and the task specifically

(Bandura, 1997). It is likely that when people have experience with a task, their personal experience has a stronger influence on specific self-efficacy than does general beliefs of self-efficacy, while general self-efficacy may be more important in novel situations (Shelton, 1990). Taken together, the results support the idea that general beliefs of self-efficacy may be one source of information people use when judging their specific self-efficacy in relation to a certain behaviour (Shelton, 1990; Watt & Martin, 1994) and that a greater sense of control increases the likelihood of high efficacy expectations in specific behavioural situations (Clark, 1996).

The positive correlation between HLC internal and behavioural specific outcome expectancies indicates that those who believe in the individual's behaviour as the means to health outcomes (internal-HLC) also tend to believe more that a specific health behaviour (fruit and vegetable consumption) can promote health and help one to avoid illness. The negative correlation between HLC-chance and specific outcome expectancies shows that those who tend to believe that health outcomes are influenced by chance/fate (external HLC) also tend to believe less in the efficacy of fruit and vegetable consumption in promoting health and avoiding illness. These results support Ajzen's (1988) argument that HLC may be regarded as a disposition to hold certain beliefs. Hence, HLC-internal increases, while HLC-chance decreases, the likelihood of positive outcome expectancies in relation to specific health behaviours.

For both self-efficacy and outcome-expectancies, the behaviour specific beliefs were more strongly related to specific intention than were the general beliefs (GSE and HLC). This is in line with the principle of compatibility (Ajzen & Fishbein, 1974). Hence, the more correspondence there is between the disposition and the behavioural indicator, the stronger

their relationship is expected to be. It follows from this that a specific behaviour will be better predicted by specific beliefs about that behaviour (Ajzen, 1988). Hence, global beliefs may be related more to the tendency to hold specific beliefs rather than to act in specific ways (Ajzen, 1988). While the effect of global beliefs on a single behaviour may be small, the contribution across several domains and behaviours may be substantial (Shelton, 1990; Steptoe & Wardle, 2001). However, as the emphasis in health psychology has been more on predicting variance in specific behaviours than on predicting patterns of behaviour across situations, the influence of distal (global) control has been a relatively neglected area of research (Armitage, 2003). The results from the present study show that there seems to be some consistency across perception of control at different levels of generality, an issue that should be addressed in further research, especially if the interest is in understanding patterns of behaviour.

#### 4.3 Perceived control as SES-health behaviour mediator?

The results from the present study indicate that the relationship between SES and health behaviour is only partly mediated by perceived control. This seems to be in accordance with results from other studies (Bailis et al., 2001; Janssen et al., 2000). Since health behaviour is determined by multiple factors that are both cognitive and non-cognitive, it would be unlikely that a single variable such as control would fully mediate the association. Although social cognition models were developed to account for social variations in health behaviours (Armitage & Conner, 2000; Conner & Norman, 1996), there is limited empirical support for the fact that the social cognition variables actually do mediate the relationship between socio-demographic variables and health behaviour. For example, Janssen et al.,(2000) reported that perceived behavioural control only partly mediated the relationship between education and sexual behaviour, while Armitage et

al.(2002) reported that the theory of planned behaviour failed to fully mediate the effect of gender on health check attendance. The results from the present study point to the need for further research to examine if social cognitive variables other than perceived control may explain part of the association between SES and health behaviour. In this respect, perhaps descriptive norm, the perception of what significant others typically do (Rivis & Sheeran, 2003), should be addressed. Given the increasing unequal distribution of behavioural risk and protective factors between different social groups, further research on other possible mediators is especially warranted.

In addition to considering other possible mediators, it is also possible that understanding the relationship between SES and health behaviour is limited by the tendency in health psychology to focus on explaining most variance in a single behaviour, as opposed to understanding patterns of behaviour (Armitage, 2003). Elstad (2000) has suggested that social differences in health behaviours may be better understood within a lifestyle approach. Such an approach implies studying a set of interrelated attitudes, behaviours and consumption patterns that have a social meaning and display the social status and social identity of the individual (Elstad, 2000).

Further, health behaviours may be classified in a number of ways such as risk enhancing vs. health promoting, while some behaviours are carried out mainly for health purposes, others may be carried out for both health and non-health factors (Steptoe & Wardle, 2001). It might be that health behaviour is too wide a category, and that more attention needs to be paid to what type of behaviour is under study when trying to understand educational differences. While some behaviours are mainly performed for the health purpose of avoiding disease or detecting it at an early phase (e.g. breast self-examination, screening

attendance, condom use), other types of behaviour may be performed for both health reasons and non-health reasons (e.g. physical activity, food choice). Thus, different types of behaviours may also be related to different mediators. Finally, health behaviours are also influenced by external variables. For fruit and vegetable consumption, price and familiarity have been shown to be related to both SES and behaviour and thus may serve as mediators (Dittus, Hillers, & Beerman, 1995; Steptoe & Wardle, 1999).

While general self-efficacy has a positive effect on self-efficacy related to specific health behaviours, general beliefs of self-efficacy may also influence health through mechanisms other than health behaviour. Results from Paper I showed that general beliefs of self-efficacy were positively correlated with satisfaction with life and positive affect, and negatively correlated with negative affect. Along the same line, Judge, Erez, Bono & Thoresen (2002) reported that GSE was positively correlated with life satisfaction and happiness. Hence, the positive effect of general self-efficacy on health is not restricted to health behaviour. In fact, Bailis et al. (2001) concluded that health-related behaviours did not serve as the primary mechanism through which perceived control influenced health outcomes, while Skaff et al. (2003) only found limited support for a model in which control beliefs influenced health by increasing health management behaviours. Bandura (1995) has argued that there are mainly two ways by which self-efficacy has an influence upon health: one through its influence on health behaviour and the other through the way that people confront stressors in their lives. Aspinwall & Taylor (1997) suggested that self-efficacy should be related to the establishment of social network and social support. Although personal control and social support are often regarded as two separate coping resources, Schroder et al. (1998) reported that perceived self-efficacy was positively related to adaptive coping by means of using social support. Consequently, there seems to

be a need for research focusing on other mechanism through which general beliefs of control may influence health outcomes.

#### 4.4 Educational level and coping with health related messages

The negative relationship between educational level and non-adaptive coping indicate that women with lower education use more avoidance types of coping (i.e. denial and disengagement) when exposed to health messages. A similar relationship has been reported for socio-economic status and coping with other stressors. Thus, the present study supports the view that avoidant coping seems to be more pronounced among people with lower socio-economic status (Ben-Zur, 2002; Taylor & Seeman, 1999).

There may be a number of reasons for this tendency. For example, Cohen, Kaplan, & Salonen (1999) have suggested that people with different levels of socio-economic status develop different “psychological styles”. For example, people with lower SES have lower levels of self-esteem, mastery and control, which again relates negatively to the use of non-adaptive coping strategies (Ben-Zur, 2002; Carver et al., 1989; Pearlin & Schooler, 1978; Taylor & Seeman, 1999). Hence, if people with lower socio-economic status believe that health is just a matter of fate/chance, believe less in the efficacy of health behaviour and are less convinced that they can perform the behaviour, it is also likely that they will distance themselves from such information.

It is also possible that the substantial and often contradictory health messages that people are exposed to may turn out to be more confusing for those with lower levels of education (Gabhainn et al., 1999; Russell, 1993). Self & Rogers (1990) showed that if people believe that they cannot cope with a threat, increasing the level of threat may have a boomerang

effect and actually decrease the intention to perform a health behaviour in the future.

Hence, if people think there is nothing to be done or that they will not be able to do what is necessary, they will tend to use maladaptive coping responses when faced with a threat or challenge.

Non-adaptive coping was negatively related to behavioural intentions and positively related to negative emotions. Consequently, it seems to be adequate in the field of health behaviour research to classify these coping strategies as dysfunctional or non-adaptive and Carver & Scheier (1994) argue that these avoidance types of coping typically work against people rather than to their advantage. The tendency for lower educated women to use these avoidant strategies when exposed to health messages may be relevant for understanding increasing social inequalities in health behaviours. It should be of high concern that those with the most resources benefit the most from health education. This represents a major challenge for health education/health promotion work.

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# PAPER I



# PERCEIVED SELF-EFFICACY IN HEALTH BEHAVIOUR RESEARCH: CONCEPTUALISATION, MEASUREMENT AND CORRELATES

ANETTE LEGANGER<sup>1,\*</sup>, PÅL KRAFT<sup>1</sup> and ESPEN RØYSAMB<sup>2</sup>

<sup>1</sup>*Research Centre for Health Promotion, Faculty of Psychology,  
University of Bergen*

<sup>2</sup>*Department for Epidemiology, National Institute of Public Health, Oslo*

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Two studies examine the psychometric properties and socio-demographic correlates of the General Self-efficacy Scale (GSE) (Jerusalem and Schwarzer, 1986; Schwarzer, 1993). Further, the relationship between GSE and different types of task-specific self-efficacy (TSSE) was studied. Data from 421 Norwegian daily smokers aged 16–79 and 1576 Norwegian 18-year-olds were applied. The results showed that the factor structure, internal consistency and test-retest reliability of GSE were satisfactory. The construct validity of GSE was also supported. The results indicated the existence of complex relationships between GSE and gender, age and education, respectively. Positive correlations were found between GSE and smoking specific self-efficacy (SSSE) and injury risk related self-efficacy (IRSE), respectively. However, GSE did not predict the intention to try to stop smoking while SSSE did. The relationship between GSE and TSSE was addressed with reference to different types of attribution and the possibility that the value of different efficacy experiences may vary between people and throughout the lifecourse.

KEY WORDS: Self-efficacy, intention, attribution, gender, age, education, smoking cessation, injury risk.

## INTRODUCTION

Self-efficacy is the belief that one is capable to perform the behaviours required to produce a desired outcome. The concept was initially launched by Bandura (1977) as a construct in social learning theory, and it also plays a central role in the more recent social cognitive theory (Bandura, 1986). Self-efficacy is considered to be an important determinant of behavioural change because of its influence on the initial decision to engage in a behaviour (intention), the effort expended, and the persistence when facing difficulties (Bandura, 1977; 1986). According to Bandura (1977) self-efficacy beliefs can originate from four main forms of information. The most important source is the experience of personal mastery, but efficacy expectations can also originate from vicarious learning, verbal persuasion, and physiological feedback. The prominence of personal experience for developing self-efficacy has been understood in relation to how people attribute their own experiences (Kok, Den Boer, DeVries, Gerards, Hospers and Mudde, 1992). It follows from Weiner's attribution model (Weiner, 1985) that when behavioural outcomes are negative, unexpected or important people will be particularly prone to search for explanations. If people attribute their experiences of failure to stable causes (for example lack of ability) their

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\* Corresponding author. Tel.: +47 55 58 28 08; Fax: +47 55 58 98 87; E-mail: anette.leganger@psych.uib.no.

expectancy of future success tends to be deflated as compared to when failures are attributed to unstable causes (such as lack of effort) (Kok *et al.*, 1992; Weiner, 1985).

Some authors (e.g., Kirsch, 1985) have argued that Weiner's concept "expectancy of success" is correspondent to Bandura's concept of self-efficacy. However, while expectancy of success is determined by the perceived stability of the cause, feelings about the self are considered to be influenced primarily by the locus (internal-external). It hence follows that only successes and failures perceived as due to internal causes will influence self-esteem and self-worth (Weiner, 1985). Accordingly, attributing success to chance or skill will influence to what extent success experience will contribute to one's self-efficacy expectations (Bandura, 1977; Sherer, Maddux, Mercandante, Prentice-Dunn, Jacobs and Rogers, 1982). High perceived self-efficacy is hence positively associated with the internal attribution of success and negatively associated with the internal attribution of failure (Schwarzer and Jerusalem, 1989). As a consequence, people who have experienced success at many different tasks are expected to have higher levels of self-efficacy, as compared to those who have experienced success less frequently (Shelton, 1990; Sherer *et al.*, 1982; Watt and Martin, 1994). Furthermore, since persons high in self-efficacy tend to set themselves more ambitious goals, to put down more effort and be more persistent when facing difficulties (Bandura, 1995; Schwarzer and Fuchs, 1996) they will also tend to have more mastery experiences. Due to the reciprocal relationship between self-efficacy and behaviour their self-efficacy will thus stay high or even increase. In contrast, low self-efficacy persons tend to set less ambitious goals, invest less effort and give up easier when meeting difficulties. As a consequence, their chances of experiencing failures are increased and they will experience mastery less frequently. Consequently, because of their attribution style, their level of self-efficacy will tend to be deflated. Thus, as Bandura (1995) has expressed it, "disbelief in one's capabilities creates its own behavioral validation" (p. 4).

Although the above reasoning seems to be generally agreed upon, empirical findings are not unanimous. To mention but one example it has been reported in smoking research that cessation specific self-efficacy appears to be negatively associated with the tendency to attribute previous quit failure to stable causes (Eiser, Van der Pligt, Raw and Sutton, 1985; Grove, 1993). Along the same line, Grove (1993) reported that smokers both high and low in self-efficacy tended to attribute previous quit failures more to personal than to situational factors. However, those high on self-efficacy more often attributed the quit failure to unstable personal causes (such as insufficient motivation) while those low in self-efficacy more often attributed their quit failure to stable personal factors (for example, will-power). High self-efficacy smokers also tended to attribute quit failure more to situational factors.

To summarise, research supports the notion that high self-efficacy persons tend to attribute failure more to situational or unstable internal factors, while low self-efficacy persons tend to attribute failure more to stable internal factors. In addition, Dutton and Brown (1997) have reported that high self-efficacy persons tend to attribute success more to stable personal factors (ability) than do those low in self-efficacy. An additional finding in that study was that people with high self-esteem seemed to be less affected by failure, which is in accordance with findings reported by Jerusalem and Schwarzer (1992) in that people high in general self-efficacy were less affected by the experience of failure. In contrast, Watt and Martin (1994) did not observe any differences in attribution after success and failure feedback between persons who were low and high in general and task specific self-efficacy, respectively. They concluded that self-serving bias operated in both groups, which will have the consequence that high self-efficacy will tend to be maintained while low self-efficacy

will tend to increase. However, they also underlined the need to study more closely the possible existence of a threshold level of self-efficacy below which self-serving bias may prove to work in the opposite direction (Watt and Martin, 1994).

Self-efficacy can be characterised by level (magnitude), strength and generality (Bandura, 1977; 1986). Level refers to the estimate of one's best possible performance; strength to one's confidence in this estimate, and generality to the number of domains of functioning in which people judge themselves to be efficacious (O'Leary, 1985). The latter contention, that self-efficacy need not necessarily be domain specific, may at first glance seem to be at odds with the earlier conceptions of self-efficacy as a domain specific construct representing an expectancy to succeed at a particular task (Bandura, 1977). It is in accordance with this latter contention that much research has focused on the role of domain or task specific self-efficacy (TSSE) as a predictor of specific intentions and behaviours (Conner and Norman, 1996). A majority of relevant studies have found self-efficacy to play a central role as a predictor of health-related behaviour (Conner and Norman, 1996; O'Leary, 1985; Schwarzer and Fuchs, 1995). As a consequence, specific self-efficacy or the closely related concept perceived behavioural control (PBC) (Ajzen, 1985) has been adopted as part of most health behaviour theories (Conner and Norman, 1996; Schwarzer, 1992). Within social cognitive theory self-efficacy expectancies are, beside outcome expectancies (which is equivalent to attitudes), considered to be related to the likelihood that a person will adopt a valued health behaviour or change an unhealthy behaviour (Schwarzer and Fuchs, 1996). In protection motivation theory (Rogers, 1983) self-efficacy has been incorporated together with threat and coping appraisals as the major predictors of the motivation to protect oneself (equivalent to behavioural intention). Finally, self-efficacy (PBC) has been included in the much applied theory of planned behaviour (Ajzen, 1985; 1988). In this model intention, which is considered to be the strongest and most proximal predictor of behaviour, is influenced by attitudes, subjective norms and PBC. PBC is primarily considered to influence behaviour indirectly via intention, but may for non-volitional behaviours also influence behaviour directly (Ajzen, 1988; Godin and Kok, 1996). Many researchers have regarded PBC to be equivalent with self-efficacy and have accordingly proposed that PBC should be replaced by self-efficacy (e.g., Schwarzer, 1992).

In health behaviour models self-efficacy (or PBC) is seen as a predictor which adds to and works in concert with the other components of the models in predicting intention and/or behaviour. Although the relative importance of each component (predictor) appears to vary for different people and for different behaviours, a recent meta-analysis by Godin and Kok (1996) indicated that self-efficacy/PBC and attitudes, respectively, tended to be equally important as predictors of behavioural intention. Furthermore, both components usually turn out to be stronger predictors of intention than do for example subjective norms. In fact, for some types of non-volitional behaviours (for example, addictive behaviours) self-efficacy even seems to be a stronger predictor of behaviour than intention is. In addition to a direct influence of self-efficacy upon intention (and behaviour), self-efficacy may moderate the influence upon intention and behaviour of several of the other components described in the above outlined models. Thus, for example positive outcome expectancies may not result in actual behaviour if the person does not believe that he or she is actually capable of performing the behaviour (Bandura, 1977; 1995; Schwarzer and Fuchs, 1995; Sherer *et al.*, 1982). Correspondingly, the impact of social influence upon adolescents to take up smoking may seem to be moderated by high levels of resistance related efficacy beliefs (Schwarzer and Fuchs, 1996).

The dominant role of TSSE as compared to general self-efficacy (GSE) in previous research may probably be understood in relation to a general tendency observed in psychological

research during the past decades to look for specific rather than general explanations (Dutton and Brown, 1997). Furthermore, it is in accordance with the point made by Ajzen and Fishbein (1977) that in order to identify strong predictors of specific intentions and behaviours one must adhere to the principle of compatibility. As a consequence, global measures (such as GSE) are most often expected to be weak predictors of specific intentions and behaviours, an expectation that has gained extensive empirical support (Ajzen, 1988; Conner and Norman, 1996). Nonetheless, Ajzen (1988) has argued that psychologists should not essentially be interested in individuals actions on specific occasions; but rather focus on such phenomena as “regularities in behaviour, consistent patterns of action, (and) response tendencies” (p. 46). It is apparently in line with this reasoning that several researchers have contributed to developing both theoretically and methodologically the notion of self-efficacy as a global construct (Schwarzer, 1993; Shelton, 1990; Sherer *et al.*, 1982). In this conception GSE is considered to embody a “pool” of an individual’s past successes that are attributed to self in that experiencing success at a task may influence upon both TSSE and GSE (Shelton, 1990). This line of reasoning also seems to be in accordance with Bandura (1977) who despite having his main focus on the role of TSSE also acknowledged that mastery experiences of specific behaviours may contribute to an increased GSE. Shelton (1990) proposed that the value attached to the experience will affect the extent to which TSSE will contribute to GSE. Correspondingly, Watt and Martin (1994) have argued that GSE may be a source of information that people use when they make an estimate of TSSE, which makes it reasonable to expect that GSE exerts its influence upon specific intentions and behaviours via TSSE (Shelton, 1990; Watt and Martin, 1994). Still, (due to the principle of compatibility) TSSE will most often be a stronger predictor of specific intentions and behaviours than GSE.

The increased interest in the notion of general self-efficacy has inspired several researchers to develop inventories which are meant to tap general self-efficacy beliefs (Jerusalem and Schwarzer, 1986; Sherer *et al.*, 1982; Tipton and Worthington, 1984). One of the most frequently applied measures is the General Self-efficacy Scale (GSE) (Jerusalem and Schwarzer, 1986; Schwarzer, 1993) which was first developed as a 20-item scale and later revised to a 10-item version. The GSE-scale was initially developed for cross-cultural application and has since been translated into several languages and applied in a variety of cultural settings (Schwarzer, Bäßler, Kwiatek, Schröder and Zhang, 1997). As regards the construct validity of the scale, several studies have reported on how GSE relates to other relevant psychological states and traits (Schwarzer, 1993; Schwarzer *et al.*, 1997). It appears that two main conclusions can be drawn from this body of research. First, that self-efficacy seems to be negatively associated with psychological states and traits that are usually negatively valued such as loneliness, depression, anxiety, shyness, pessimism, low self-esteem and helplessness (Jerusalem and Schwarzer, 1992; Lennings, 1994; Schwarzer, 1993; Schwarzer *et al.*, 1997; Sherer *et al.*, 1982). Contrary, self-efficacy seems to be positively associated with characteristics which are usually positively valued such as self-esteem, achievement motivation, internal locus of control, self-control, optimism, internality, curiosity, satisfaction, improved adjustment capabilities, and the tendency to appraise a stressful situation more of as a challenge than a threat or loss (Jerusalem and Mittag, 1995; Jerusalem and Schwarzer, 1992; Lennings, 1994; Schwarzer, 1993; Schwarzer *et al.*, 1997; Sherer *et al.*, 1982).

However, when it comes to the sociodemographic correlates of GSE the existing research seems to be less conclusive. While some studies have reported no gender differences in GSE, others have demonstrated such differences and then typically with men

obtaining higher scores than women (for an overview, see Schwarzer, 1993; Schwarzer *et al.*, 1997). The inconclusiveness of the existing research has caused Schwarzer *et al.* to urge for research that may help to clarify why and when gender differences emerge. The situation seems to be equally unclear as far as the relationship between age and GSE is concerned. Thus, while Schwarzer (1993) concluded that there is no relationship between GSE and age, Hays and Buckle (1992) reported a positive correlation between GSE and age in a sample of psychiatric patients. In the educational domain self-efficacy have been found to affect students aspirations, level of interests and academic accomplishments (Bandura, 1995; Zimmerman, 1995). However the majority of research in this area has focused on domain or task-specific self-efficacy (such as academic or mathematics self-efficacy) (Bandura, 1995; Lent, Brown and Gore, 1997; Zimmerman, 1995). A few studies have examined the role of GSE on academic achievement but the results are not conclusive (Ferrari and Parker, 1992; Tuckman, 1991). Among adults, Sherer *et al.* (1982) reported on a positive relationship between educational level and GSE in a sample of military veterans.

The present article addresses empirically a number of general problems alluded to above. It reports data from two studies: a sample of 421 Norwegian daily smokers aged 16–79, and a sample of 1576 18-year-old Norwegians. The specific hypotheses of the studies are described in detail below, but in general terms the purpose of the present article was to study: (a) the test–retest and internal consistency reliability of the GSE scale; (b) the factorial structure and the construct validity of GSE; (c) the association between GSE and socio-demographic correlates; (d) the relationship between GSE, TSSE and intention; (e) how GSE and SSSE was related to the attribution of a previous smoking quit failure.

## STUDY 1

Study 1 reports descriptive statistics of the 10-item General Self-Efficacy Scale (GSE) (Jerusalem and Schwarzer, 1986; Schwarzer, 1993). Based on previous research we hypothesised the scale to be uni-dimensional (Schwarzer, 1993; Schwarzer *et al.*, 1997). Due to inconsistent findings in previous research no particular relationships were hypothesised between GSE and gender and age, respectively, while a positive association was expected between GSE and education. Further, the association between GSE and TSSE (represented by SSSE, i.e., efficacy expectations related to quit smoking) was addressed. We expected to observe a positive association between GSE and SSSE. Furthermore, a positive association between SSSE and intention to make a quit attempt was expected. However, due to lack of compatibility, only a weak (positive) association between GSE and intention was expected, and to the extent that GSE would predict intention, the effect was expected to be transmitted via SSSE. From previous research (Godin and Kok, 1996; Kok *et al.*, 1992), we expected that the predictive power of SSSE upon intention would approximate that of attitudes (outcome expectancies). In keeping with theoretical reasoning, but apparently in contrast to empirical findings (Sutton, Marsh and Matheson, 1987) the effects of outcome expectancies and SSSE were expected to combine multiplicatively to influence intention. Finally, we expected to observe an association between GSE and attribution of previous quit failure. Hence those who were comparatively low on GSE were expected to put more weight on a stable internal cause (willpower) when they attributed the cause of most recent quit failure, as compared to those comparatively high in GSE. Accordingly, those high in GSE were expected to put more weight on labile and controllable causes (effort and strategy), as

compared to those low in GSE. Finally, the tendency to attribute previous quit failure to willpower was hypothesised to be negatively associated with SSSE.

### *Subjects and Procedures*

Data were collected in relation to a cross-sectional survey directed by the Norwegian Council on Tobacco and Health in November 1995. The sample was selected according to Statistic Norway's standard sampling system designed to ensure a sample that is representative of the adult Norwegian population aged 16–79 years. Interviews were carried out with 1411 people yielding a response rate of 71%. Every respondent answered the question: Do you smoke? Their alternatives were "yes daily", "yes, occasionally" and "no". Four hundred and twenty-one respondents (49.4% males, 50.6% females) replied that they smoked daily and subsequently comprised the material for this study. Three hundred and forty-four daily smokers reported to have experienced at least one quit attempt and responded to questions pertaining to the last quit attempt (see also Kraft, Sutton and McCreath, 1999).

### *Measures*

General self-efficacy was measured by a Norwegian version of the General Self-efficacy Scale (GSE) (Jerusalem and Schwarzer, 1986; Schwarzer, 1993). The scale consists of ten items assessing the strength of an individual's belief in his/her ability to respond to novel or difficult situations and to deal with any associated obstacles or setbacks (e.g., "I can solve most problems if I invest the necessary effort") (the Norwegian version is given in Appendix I). Responses were reported on a four point scale ranging from (1) = Not at all true, to (4) = Exactly true. The scores for each item were summed to give a total GSE score (range 10–40).

Smoking specific self-efficacy (SSSE) was measured by a single-item question assessing the subjective probability of succeeding given that a quit attempt is made (Marsh and Matheson, 1983; Sutton *et al.*, 1987): (And) If you tried, how likely is it that you would succeed in giving up smoking? Responses were reported on a 7-point scale ranging from (1) I am sure I would fail if I tried, to (7) I am sure I would succeed if I tried (mean = 4.6, *SD* = 1.5).

Positive and negative outcome expectancies towards smoking were assessed by means of the Smoking Decisional Balance Scale (SDBS) (Velicer, DiClemente, Prochaska and Brandenburg, 1985). The pros of smoking reflect the pleasurable and anxiety-reducing effects of smoking, while the cons represent the possible adverse health consequences and the perceived social influence not to smoke (Sutton *et al.*, 1987; Velicer *et al.*, 1985). 7 items related to the pros and 7 items related to the cons of smoking, respectively, were included in the present study. Each item was rated on a 5-point scale which assessed the importance of that specific consequence for smoking or not-smoking. The relevant items were summed to give a summary score for pros (range = 7–35; mean = 20.9; *SD* = 4.3;  $\alpha$  = 0.61) and cons (range = 7–35; mean = 24.4; *SD* = 5.4;  $\alpha$  = 0.74), respectively.

Attribution of failure to stop smoking at the most recent quit attempt was assessed by three questions representing three types of attributions (a) internal, unstable; (b) external, unstable, and; (c) internal stable. Thus, on a 7-point scale ranging from (1) disagree completely to (7) agree completely, the respondents answered the following questions: Think about the last time you tried to quit smoking. To what extent do you agree with the following statements: (a) I didn't succeed because I didn't try hard enough; (b) I didn't succeed

because I used a wrong strategy, and (c) I didn't succeed because I am a person with a weak willpower. Intention to try to stop smoking was assessed by asking: How likely is it that you will try to give up smoking? Responses were reported on a 7-point scale ranging from (1) I will definitely not try to give up, to (7) I will definitely try to give up (mean = 4.7;  $SD = 1.7$ ) (for a discussion of assessing intention in this way see Kraft *et al.*, 1999; Morojele and Stephenson, 1994; Sutton *et al.*, 1987; Warshaw and Davis, 1984; 1985).

Demographic variables relevant for this study were; gender (208 males, 213 females), age (mean = 39.5,  $SD = 14.1$ ), and level of education: low = 9 years or less; 23.0%; medium = 10–12 years; 59.9%; high = 13 years or more; 12.1%, while 5% did not report their educational level.

### *Analysis*

Principal component analysis (PCA) was carried out on the ten GSE items in order to determine the number of factors to retain. The optimal number of factors was established by combining two criteria: (1) Kaisers eigenvalue rule which says that eigenvalues of the factors should be greater than 1 (Nunally, 1978) and (2) the scree test (Cattell and Vogelmann, 1977). Internal consistency of the factors was assessed by  $\alpha$  coefficients (Cronbach, 1951) and split-half reliability in which a random first half of the items is drawn to compare with another half of the items (in fact split-half reliability is a special case of coefficient  $\alpha$  in that the latter is the average of all possible split-halves (Cronbach, 1970; Nunally, 1978)). The factor structure obtained by the exploratory factor analysis was subjected to a constrained maximum likelihood confirmatory factor analysis of a pre-hypothesised factor structure applying LISREL 8 (Jöreskog and Sörbom, 1993). LISREL 8 provides several fit measures of the fit between a hypothesised model and the empirical data. The Goodness of Fit Index (GFI) which indicates the relative amount of variance and covariance accounted for by the model, should be at least 0.90; the Adjusted Goodness of Fit Index (AGFI) in which the degrees of freedom is adjusted for should be above 0.80 (Donovan, Jessor and Costa, 1993; Kline, 1991); a Root Mean Square Residual (RMR) below 0.10 should be observed (Kerlinger, 1986); and finally the Root Mean Square Error of Approximation (RMSEA) should preferably not exceed 0.08 (Browne and Cudeck, 1993; Jöreskog and Sörbom, 1993).

In addition to the above statistical techniques a number of descriptive statistics, product moment correlation, ANOVA and regression analysis were applied. LISREL 8 (Jöreskog and Sörbom, 1993) was applied for a formal path analytic test of the hypothesised associations between GSE, TSSE and intention.

## RESULTS

Mean scores for the ten GSE items ranged from 2.47 to 3.29 ( $SD$  ranged from 0.71 to 1.03) (Table 1). The Kaiser-Meyer-Olkin measure of sampling adequacy (0.86), and Bartlett's test of Sphericity ( $\chi^2 = 1172$ ,  $p < 0.000$ ), indicated that the correlation matrix was appropriate for factor analysis. Principal component analysis extracted two factors with Eigenvalues greater than 1.00, namely 3.99 and 1.07, but the scree test indicated that a one-factor solution was most appropriate. However, to test more formally whether a one factor or two-factor model fitted the data best a confirmatory factor analysis using LISREL 8 (Jöreskog and Sörbom, 1993) was performed. The results showed that there were no significant

**Table 1** Descriptive statistics of GSE items and results from principal component analysis

Item	Study 1					Study 2				
	mean	SD	Loading	$h^2$	C-ITC	mean	SD	Loading	$h^2$	C-ITC
1	3.28	0.78	0.62	0.38	0.51	2.67	0.82	0.67	0.46	0.59
2	2.47	1.03	0.32	0.10	0.25	2.48	0.82	0.65	0.42	0.56
3	2.86	0.90	0.51	0.26	0.41	2.29	0.83	0.60	0.37	0.51
4	2.96	0.87	0.68	0.47	0.55	2.31	0.82	0.75	0.56	0.66
5	2.86	0.84	0.72	0.52	0.59	2.19	0.82	0.73	0.53	0.64
6	3.20	0.76	0.74	0.55	0.63	2.84	0.83	0.71	0.50	0.62
7	2.88	0.90	0.71	0.50	0.59	2.20	0.87	0.75	0.56	0.66
8	2.97	0.82	0.50	0.25	0.39	2.34	0.80	0.62	0.38	0.52
9	3.29	0.71	0.66	0.43	0.54	2.71	0.75	0.68	0.47	0.59
10	2.86	0.86	0.72	0.52	0.61	2.31	0.86	0.70	0.49	0.61

Note:  $h^2$  = communality; C-ITC = Corrected item total correlation.

differences in fit statistics between the one- and two-factor models. Thus, due to the principle of parsimony, the scree test, and the fact that the scale has been reported to be unifactorial in previous studies (Schwarzer, 1993; Schwarzer *et al.*, 1997), we decided to proceed with the one-factor solution. That model accounted for 39.9% of the total item variance, and provided acceptable fit statistics (Table 2).

The corrected item total correlations ranged from 0.25 to 0.63 while the factor loadings ranged from 0.32 to 0.74 (Table 1). Internal consistency of GSE was satisfactory with  $\alpha=0.82$ , while the Guttman split-half reliability coefficient was 0.78. The GSE scale was constructed as a sum score index (range 10–40) by adding the responses to each of the ten items. The sample GSE mean was 29.6 ( $SD=5.2$ ). The tail of the distribution was towards smaller values and the distribution was thus slightly negatively skewed (skewness =  $-0.35$ ; kurtosis =  $0.17$ ; Kolmogorov Smirnov  $z$ -value =  $1.1$ ,  $p=0.17$ ).

No significant difference in GSE mean scores was observed between women (mean =  $29.2$ ,  $SD=5.4$ ), and men (mean =  $30.0$ ,  $SD=5.0$ ). Furthermore, we did not observe the expected positive relationship between GSE and education. Hence GSE mean levels were  $29.2$  ( $SD=5.8$ );  $29.6$ , ( $SD=4.9$ ) and  $30.1$  ( $SD=4.9$ ) in groups of persons with low, medium and high education, respectively. However by splitting by gender, a gender–education interaction effect was observed. Among women there was a marginally significant correlation between GSE and education ( $r=0.13$ ,  $p=0.06$ ) while this was not the case among men. Thus, a significant difference in mean GSE scores ( $t=2.00$ ,  $p<0.05$ ) was observed between men with the lowest level of education (mean =  $30.3$ ,  $SD=5.6$ ) and the corresponding group of women (mean =  $27.9$ ,  $SD=5.8$ ). In contrast, no gender differences in GSE mean scores were observed among those with medium and high levels of education, respectively.

There was no bivariate association between age and GSE. However, by breaking down by gender and education some interesting age differences occurred. First, a negative association was observed (in both sexes) between GSE and age ( $r=-0.21$ ,  $p<0.05$ ) among those with the lowest level of education. Secondly, no association between GSE and age was observed among those (both sexes) with medium level of education ( $r=0.05$ ,  $p<0.05$ ). Third, among males with the highest level of education a positive curv-linear relationship was observed between age and GSE ( $F(1, 21)=5.05$ ,  $p<0.05$ ). This curv-linear relationship was due to the fact that in this group of males GSE increased with age between ages 16 and 65 ( $r=0.62$ ,  $p<0.01$ ), whilst above the age of 65 there was a non-significant negative correlation.



**Table 2** Confirmatory factor analysis: Goodness of fit statistics

	<i>Study 1</i>	<i>Study 2</i>
Goodness of fit index (GFI)	0.93	0.94
Adjusted GFI (AGFI)	0.89	0.91
Root mean square residual (RMR)	0.055	0.043
Root Mean Square Error of Approximation (RMSEA)	0.093	0.089

The correlation between SSSE and intention to try to stop smoking was 0.41, while the associations between outcome expectancies and intention were 0.33 for the cons and  $-0.26$  for the pros of smoking, respectively (all correlations significant at  $p < 0.01$ ). When pros and cons were entered as independent variables into a regression analysis they explained 17% of the variance in intention. When SSSE was entered into the regression model, in a second step, the explained variance in intention increased to 27%. In the full regression model the  $\beta$  coefficients were 0.33 for SSSE, 0.28 for cons and  $-0.15$  for pros, respectively (all  $\beta$ 's significant at  $p < 0.001$ ). No significant interaction effects were observed between SSSE and outcome expectancies (PROS and CONS, respectively) in predicting intention to try to stop smoking. The hypothesised positive association between GSE and SSSE was empirically confirmed ( $r = 0.23$ ,  $p < 0.01$ ). Furthermore, as expected, only a weak (and non-significant) positive association was observed between GSE and intention. Thus, while GSE was significantly associated with SSSE ( $r = 0.23$ ), and SSSE was significantly associated with intention ( $r = 0.41$ ), no significant bivariate association between GSE and intention was observed ( $r = 0.090$  ( $0.23 \times 0.41$ )).

When the hypothesised relationships between GSE, TSSE and intention were subjected to a formal path analysis using LISREL 8, the expected findings were observed. The path analysis revealed a significant path from GSE upon TSSE ( $\beta = 0.28$ ), and from TSSE upon intention ( $\beta = 0.42$ ), while no significant direct path from GSE upon intention was observed. Satisfactory model fit statistics were obtained (GFI = 0.93; AGFI = 0.89; RMR = 0.053; RMSEA = 0.079).

Respondents who had experienced a quit attempt (and failed) tended to put more explanatory weight for their failure on effort (mean = 5.4;  $SD = 1.9$ ) than on the application of an inappropriate strategy (mean = 3.9;  $SD = 2.1$ ) or lack of willpower (mean = 3.7;  $SD = 2.3$ ). As hypothesised the tendency to attribute previous quit failure to an internal stable cause (willpower) was negatively associated with both GSE ( $r = -.12$ ,  $p < 0.05$ ) and SSSE ( $r = -0.14$ ,  $p < 0.01$ ). However, no associations were observed between self-efficacy beliefs (GSE and SSSE, respectively) and the tendency to attribute failure to unstable causes (strategy or effort).

## STUDY 2

The purpose of this study was to shed light on the factorial structure, reliability, and validity of GSE (Jerusalem and Schwarzer, 1986; Schwarzer, 1993). Reliability was assessed by internal consistency, split-half- and test-retest reliability. Construct validity was studied by how GSE correlated with several other psychological states and traits. We expected to observe positive associations between GSE and positive affect, satisfaction with life, sensation seeking, and internal health locus of control, respectively. In contrast, negative associations between GSE and negative affect and the "chance" and "others" subscales on the

health locus of control scale, were expected. Criterion validity was studied by how GSE related to educational aspiration. We expected to observe a positive association between GSE and TSSE as represented by a measure of injury risk related self-efficacy (IRSE). IRSE reflected the belief that one is capable of avoiding dangerous situations and adopt appropriate preventive measures. We expected a positive correlation between GSE and educational aspirations as GSE should be related to higher goal setting (Lennings, 1994; Schwarzer and Fuchs, 1996; Woodruff and Cashman, 1993). Finally, the relationship between GSE and gender was analysed.

### *Subjects and Procedures*

Data were collected as part of a study on injury related behaviours which was performed in two counties in Western Norway during December 1993 and January 1994. In one county, Sogn and Fjordane, the whole population of 18-year olds comprised the target sample, while in the second county, Møre and Romsdal, a target sample was drawn from the total population of 18-year-old persons. Data were collected by means of mailed questionnaires. The final material consisted of 1576 18-year-old adolescents (52.2% females and 47.8% males) (survey response rate 63%). Ninety-three randomly drawn respondents participated in a retest which was conducted seven weeks after the first data collection in order to examine the temporal stability of the measures (see also Røysamb, Rise and Kraft, 1997).

### *Measures*

General self-efficacy (GSE) was measured as in study 1. Injury risk related self-efficacy (IRSE) was measured by a two item scale responded to on a similar scale as the GSE items. The items assessed the respondents' perceived efficacy regarding avoiding dangerous situations and adopting injury preventive safety measures, respectively. Scores on each item were summed to give a sum score (range 2–8; mean = 5.6;  $SD = 1.4$ ;  $\alpha = 0.65$ ). Positive and negative affect was measured by the Positive Affect and Negative Affect Schedule (PANAS) (Watson, Clark and Tellegen, 1988) which comprises 10 positive affects (e.g., interested, excited) and 10 negative affects (e.g., nervous, upset). Respondents were instructed to report on their general degree of experiencing each affect on a five-point scale from (1) very slightly or not at all, to (5) extremely. Two scales were constructed: positive affect (range = 10–50; mean = 33.3;  $SD = 6.0$ ;  $\alpha = 0.77$ ) and negative affect (range = 10–50; mean = 19.8;  $SD = 6.2$ ;  $\alpha = 0.82$ ). Satisfaction with life was measured by Satisfaction With Life Scale (SWLS) (Diener, Emmons, Larsen and Griffin, 1985) comprising five items responded to on a seven point scale from (1) strongly disagree to (7) strongly agree (range = 5–35; mean = 22.8;  $SD = 6.0$ ;  $\alpha = 0.81$ ). Sensation Seeking was measured by applying 17 items from the Sensation Seeking Scale 18 (Pedersen, Clausen and Lavik, 1988). This is a Norwegian modified version of the Sensation Seeking Scale (Zuckerman, 1979). Responses to the items were added to give an overall SSS score (range = 0–17; mean = 9.3;  $SD = 3.0$ ;  $\alpha = 0.65$ ). The Multidimensional Health Locus of Control Scales (MHLC) (Wallston, Wallston and DeVellis, 1978) comprised 18 items considered to represent three sub-factors. Each of the scales included six items responded to on a six point scale from (1) strongly disagree to (6) strongly agree. Responses to the relevant items were added to comprise three indices: "internal" (range = 6–36; mean = 25.3;  $SD = 4.2$ ;  $\alpha = 0.64$ ); "others" (range = 6–36; mean = 16.7;  $SD = 4.9$ ;  $\alpha = 0.67$ ), and; "chance" (range = 6–36; mean = 18.5;  $SD = 4.5$ ;  $\alpha = 0.54$ ). Finally, respondents reported information pertaining to their educational

**Table 3** Correlations between GSE and relevant psychological measures (Pearson's  $r$ )

	1	2	3	4	5	6	7
1 GSE							
2 PANAS negative affect	-0.21						
3 PANAS positive affect	0.40	-					
4 Chance-HLOC	-	0.10	-0.11				
5 Internal-HLOC	0.23	-	0.14	-			
6 Powerful others-HLOC	-	-	-	0.24	0.07		
7 Sensation Seeking	0.23	-	0.15	-0.07	-	-0.19	
8 Satisfaction With Life (SWLS)	0.26	-0.28	0.35	-	0.11	-	-

Note: Only correlations with  $p < 0.01$  are reported.

aspirations. Five response options were offered from (1) no education after secondary school, to (5) more than four years in university.

### Analysis

See study 1.

### Results

Mean GSE scores for the single items ranged from 2.19 to 2.84 ( $SD$  ranged from 0.75 to 0.87) (Table 1). The Kaiser-Meyer-Olkin measure of sampling adequacy (0.91) and Bartlett's test of sphericity ( $\chi^2 = 5470.7$ ,  $p < 0.000$ ) showed that the item correlation matrix was appropriate for factor analysis. Principal component analysis extracted one factor with eigenvalue 4.73, which thus explained 47.3% of the total item variance. The scree test also indicated the adequacy of a one factor solution. The corrected item total correlations ranged from 0.51–0.66 while the factor loadings ranged from 0.60 to 0.75 (Table 1). The one-factor model was subjected to a confirmatory factor analysis and satisfactory fit statistics were obtained (Table 2). The internal consistency of the scale was excellent with  $\alpha = 0.88$ , while the Guttman split half reliability coefficient was 0.83. The test-retest reliability as expressed by the correlation (Pearson's  $r$ ) between GSE scores measured at the two measurement occasions (seven weeks apart) was 0.82.

The sample GSE mean was 24.3 ( $SD = 5.7$ ). The distribution was slightly positively skewed (skewness = 0.17; kurtosis = -0.16; Kolmogorov Smirnov  $z = 1.9$ ,  $p < 0.01$ ). The mean GSE score for girls (23.4,  $SD = 5.7$ ) was significantly lower than that for boys (25.4,  $SD = 5.5$ ) ( $t = 7.2$ ,  $p < 0.001$ ). In both sexes a weak (but significant) positive correlation was observed between GSE and educational aspirations ( $r = 0.12$ ,  $p < 0.01$  for girls and  $r = 0.08$ ,  $p < 0.05$  for boys). No difference in mean GSE was observed between adolescent smokers and non-smokers.

As hypothesised, a positive correlation was observed between GSE and IRSE ( $r = 0.29$ ;  $p < 0.01$ ). As expected GSE was positively correlated with positive affect ( $r = 0.40$ ), internal health locus of control ( $r = 0.23$ ), satisfaction with life ( $r = 0.26$ ) and sensation seeking ( $r = 0.23$ ) (all correlations  $p < 0.01$ ). Additionally, the expected negative association between GSE and negative affect was empirically observed ( $r = -0.21$ ;  $p < 0.01$ ). On the other hand, the expected negative associations between GSE and the "chance" and "other" scales, respectively, of MHLC were not observed (Table 3).

## DISCUSSION

*Psychometric Properties and Validity of GSE*

The present article reported data from a sample of Norwegian daily smokers and a sample of 18-year-old adolescents living in the Western part of Norway, respectively. The studies showed that GSE had acceptable test-retest, split-half and internal consistency reliability. When principal component analysis was applied and the resulting scree-plots and eigenvalues compared against accepted standards (Cattell, 1978; Kline, 1994), the appropriateness of a one-factor solution was clearly supported. When confirmatory factor analysis was applied the fit measures of the one-factor model were (in both studies) clearly acceptable when compared against suggested standards for adequate fit for models of this type (Bollen, 1989). The observation that the psychometric properties (factor loadings, explained inter-item variance, internal consistency and model fit measures) were slightly preferable in the adolescent sample as compared to the sample of smokers, was probably partly due to a higher degree of age homogeneity in that sample, which is a characteristic known to affect the results of factor analysis (Kline, 1994).

The present studies also supported the construct validity of GSE by observing the expected positive associations between GSE and positive affect, satisfaction with life, internal locus of control and sensation seeking. The observed negative correlation between GSE and negative affect support the notion that GSE is negatively associated with negative emotional states (Schwarzer, 1993). From a health behaviour perspective it was interesting to observe a positive correlation between GSE and the "internal" subscale of the multidimensional health locus of control inventory. This implies that people with high GSE tend to have a stronger belief in that they can influence their own health by personal action. On the other hand, no associations were observed between GSE and the "others" and "chance" subscales of the health locus of control inventory; i.e., the scales that represent external locus of control. Although this finding may seem a bit intriguing at first glance, it is important to remember that the belief that one can by personal action influence health need not necessarily contradict the belief that health is also influenced by other factors. A corresponding finding has been reported in attribution research in that little support has been found for an inverse relationship between personal and situational causality. In contrast, both positive and weak negative correlations have been observed between internal and external attribution when measured on separate scales, indicating that people often use a combination of external and internal explanations (Hewstone and Antaki, 1988). The expected positive correlation between GSE and educational aspirations was confirmed. This association can be understood with reference to the finding that self-efficacy should be related to higher goal setting (Lennings, 1994; Schwarzer and Fuchs, 1996; Woodruff and Cashman, 1993). Hence the observed positive relationship between GSE and educational aspiration also indicates criterion validity for the GSE scale. The relative weak relationship between GSE and educational aspirations may be due to lack of compatibility, hence GSE may be related to a number of potential goals in other domains than education. This point will be more fully discussed later.

In conclusion, the results of both studies reported in this article confirmed previous research in that general self-efficacy seems to represent a theoretically unique, uni-dimensional construct that can be reliably measured by the GSE inventory (Jerusalem and Schwarzer, 1986; Schwarzer, 1993; Schwarzer *et al.*, 1997).

*Socio-demographic Correlates*

The mean GSE score (29.6) observed among Norwegian daily smokers was close to the norm reported in German adults (29.3) (Schwarzer, 1993). In contrast, the mean GSE (24.3) in the sample of Norwegian adolescents was substantially lower, and substantially below levels that have been reported from studies of German and Costa Rican students (27.8 and 33.2, respectively) (Schwarzer *et al.*, 1997). However, the mean GSE level observed in the sample of Norwegian adolescents resembled GSE levels reported among Chinese students living in Hong Kong (24.6) (Schwarzer *et al.*, 1997). As one possible explanation for the comparatively low GSE mean level observed in the sample of Chinese students, Schwarzer *et al.* launched the hypothesis that Chinese students may possess lower levels of personal self-efficacy but higher levels of “collective efficacy”. Even though future research may provide empirical support for this explanation, it seems intuitively less relevant for the Norwegian setting. As we see it one is left with at least three explanations, not necessarily mutually exclusive, which may account for the differences in mean GSE observed in the above mentioned studies: (1) The observed differences in mean GSE levels between countries reflect “true” cross-cultural differences. If so, the “individualism–collectivism” dimension may be one, but probably not the only, underlying mechanism. (2) The GSE differences observed between countries reflect methodological differences between the studies. For one thing the sample of the Norwegian adolescents was drawn from the general population of adolescents in the two counties, and not restricted to the universe of students in these counties. Secondly, and relevant for the Schwarzer *et al.* study, the selection process of whom is becoming a student may vary considerably from one country to another. Hence, the student populations compared in that study may differ on many other relevant (socio-economic) characteristics than nationality (ethnicity). (3) The differences in mean GSE observed in the above studies are due to age differences between the study populations and reflect an age–GSE association. Thus while the mean ages of the Norwegian adolescents and the Chinese students were (approximately) 18 and 19.5 years, respectively, the mean ages of the samples of German and Costa Rican students were (approximately) 23.5 and 21 years, respectively. The possible existence of a positive age–GSE association may seem reasonable in the light of the fact that adolescence is a transitional period which requires mastering of many new skills (Bandura, 1986). Based on self-efficacy theory it would thus seem reasonable to expect that GSE will increase when adolescents move through adolescence and into adulthood and experience the mastery of new skills. However, data from longitudinal studies of adolescents are required to verify this hypothesis and, to the best of our knowledge, no such studies have been published.

Although the possible existence of an age–GSE relationship in adolescence is not sufficiently researched, a number of studies have addressed the age–GSE relationship in cross-sectional studies of adult populations. However, the empirical findings are not conclusive. While Schwarzer (1993) did not observe any relationship between age and GSE, Hays and Buckle (1992) have reported that GSE increase with increasing age. The studies reported in the present article do not help to resolve this uncertainty. In contrary, the findings may point to the existence of a complex interaction between gender, age and education. First, no gender difference in GSE was observed in the sample of smokers, while the mean GSE was higher in boys than in girls in the sample of adolescents. Thus, the present studies confirmed the inconclusiveness of previous research in that some studies have reported no gender differences while other studies have reported higher scores in men than in women (for overview, see Schwarzer, 1993; Schwarzer *et al.*, 1997). Among females a positive

bivariate correlation between education and GSE was observed, while no significant bivariate association between age and GSE was found. Among men, no significant overall bivariate associations were observed between GSE and age and education, respectively. However, an age–education interaction effect was detected for both sexes. Thus, in the low education group GSE tended to decrease with increasing age, in the medium education group no GSE–age association was observed, and in the high education group, GSE increased with age among men. In summary, the data imply that there is complex GSE–age–education relationship. Future research should strive in particular to (a) reveal the causal relationship between education and GSE in childhood, adolescence and early adulthood, and (b) disclose the role of education for changes in GSE throughout the lifecourse.

At this point we are tempted to suggest that there may exist a number of different and probably highly complex processes that involves the influence of both gender, age and education, in isolation and/or interaction, which influence an individual's self efficacy throughout the lifecourse. This assumption is based on two lines of reasoning; first a specific empirical observation from the present studies, and secondly from previous reasoning in self-efficacy research. The empirical observation was that among males with the highest level of education we observed a tendency that although the general picture was that GSE increased with age, the data suggested the existence of a curvilinear trend in that, in this group of males, GSE tended to decrease after the age of 65. Due to a low number of subjects in this group of males the curvilinear trend did not reach the level of significance and assuming such a pattern may thus seem speculative. If, however, confirmed in future research this finding may indicate that GSE is not stable in terms of more or less resembling a trait factor throughout the lifecourse. Consequently, self-efficacy perceptions may be related to, for example the occupation of certain role positions. If one assumes that older males with high education tend to occupy prestigious role positions their perceptions of self-efficacy may be related to that role position, and thus self-efficacy tends to drop when that role position is left. However, this drop in self-efficacy is not seen in males with lower levels of education, whom presumably occupy less prestigious role positions that are not an important part of their perceptions about the self. Bandura (1986) has suggested that the self-efficacy problem of the elderly may be a problem of reappraisal and re-canalising in that elderly will perceive a decline in self-efficacy if they compare their capacity with younger cohorts or what they themselves achieved as young, and this reasoning does not seem to contradict our own speculations. Thus we conclude that although much of the above reasoning is highly speculative and not fairly empirically grounded in the present studies, we think that these issues deserve the attention of future research.

The second line of reasoning that breeds the notion that highly complex and heterogeneous processes may influence GSE throughout the life-course is related to the fact that although mastery experiences in general is considered to be the most influential source of self-efficacy, the value attached to an experience also seems to be crucial for to what extent the specific experience and the relevant TSSE will influence GSE (Shelton, 1990). Which experiences are valued may vary between the sexes, between social groups, and vary with age. Hence GSE may be derived from TSSE related to different domains for different people or from different domains at different ages in one person. In our study of adolescents, the correlation between GSE and IRSE may thus indicate that GSE is influenced by IRSE (although it can not be ruled out that IRSE is a reflection of GSE). Further, Røysamb (1997) found that GSE was positively related to risk behaviour among adolescents. Accordingly mastering this type of behaviour may be one way for adolescents to raise their GSE. The negative relationship observed between age and GSE for men with lowest level

of education may be due to less value attached to the experiences on which their GSE was built as one grows older. It may also be due to failure to re-canalise self-efficacy to other domains during changing periods in life (Bandura, 1986). In line with the same reasoning education and mastering of academic tasks may not be salient when adolescents make self-efficacy judgements, hence it is not a major contributor to high GSE at young age. But as higher education is related to better social position, better personal development and mastery experiences, education might provide one with skills which are valued in adult life and give raise to GSE as reflected in the positive relationship between age and GSE for the group of highly educated men. The possibility that GSE may be related to different domains for different people has also been proposed by Woodruff and Cashman (1993) who argued that domain efficacy of some dimensions of life may exert stronger influence than others in determining general efficacy. However while Woodruff and Cashman argue that the magnitude given to each domain appears to be individually unique, we believe more research is needed to examine the role of sociodemographic variables.

Schwarzer *et al.* (1997) have underlined the need to clarify why and when gender differences in GSE emerge. We agree completely, but would like to add that the inconclusiveness of the existing empirical research and the apparently complex relationships that exist between gender, age and education on the one side and GSE on the other side, clearly support the urge for future longitudinal studies in which large groups of males and females are followed over many years. This may add important elements of knowledge to our rudimentary understanding of the causal relationship between socio-demographic variables and GSE.

#### *GSE, SSSE, Intention and Attribution*

The expected positive relationship between GSE and SSSE was confirmed in the present studies. Furthermore, and in accordance with our hypotheses, SSSE predicted the intention to stop smoking while GSE did not. Consistent with expectations the results showed that specific self-efficacy beliefs are equally important as outcome expectancies for the intention to change an unhealthy behaviour. Accordingly, raising self-efficacy is one way of increasing the chance that a person will try to change an unhealthy behaviour.

In this regard, however, one should take into account a possible limitation of the present study, which relates to how specific self-efficacy was operationalised and measured in the two studies. In both studies specific self-efficacy was operationalised as global measures (measured by one and two items, respectively), in that the subjects were expected to consider all possible factors that may enhance or diminish control over the relevant behaviours, and arrive at an overall assessment of the task specific self-efficacy. In addition, the smoking related self-efficacy question measured expectancy of success, rather than perception of control. This latter characteristic may not seem to represent a serious problem, since with regard to smoking cessation both expectancy of success and control beliefs seem to reflect the underlying belief that «one can change risky behaviours by personal actions» (Schwarzer and Fuchs, 1996). However, an alternative way to measure task specific self-efficacy would have been to apply a belief-based measure by means of a list of individual control beliefs that the sample considers salient, and subsequently combine them to an overall measure of specific self-efficacy. Schwarzer and Fuchs (1996) strongly recommend such a procedure, and also advice a specific wording of the items: «I am confident that I can (*perform something*), even if (*barrier*)». In our opinion one major benefit of such a measure is its potential usefulness for understanding particular control beliefs that makes up the task specific self-efficacy, which may provide important information when interventions

are designed. On the other hand, when the purpose is to predict intention and behaviour, a global measure of specific self-efficacy may seem to be adequate and even in some instances preferable. This speculation is based on a recent meta-analysis of the role of (the closely related construct) perceived behavioural control (PBC) in the theory of planned behaviour. In that study Notani, (1998) reported that a global measure of PBC (as compared to a belief based measure) appear to be a stronger predictor of behaviour, while no difference was observed for the prediction of intention. Some of the problems with belief based measures that have been experienced in previous research may relate to the identification of salient control beliefs and low internal consistency reliability of the PBC measure.

As expected and consistent with the findings of Schwarzer and Jerusalem (1989), GSE (and SSSE) was observed to be negatively correlated with the tendency to make internal attributions of failure. High self-efficacy (GSE and SSSE) was, however, not related to a tendency to put more weight on strategy and effort when explaining last quit attempt failure. These findings may relate to the hypothesis of Shelton (1990) in that low GSE may result from more blame to self for failure, while high GSE results from more credits to self for success. Jerusalem and Schwarzer (1992) suggested that high GSE is a "shelter" from all kinds of failure feedback. Accordingly one reason why high GSE is not associated with external attribution after failure may be that high GSE persons do not perceive failure at a task as threatening their GSE and self-esteem and hence make fewer attributions. In contrast, low GSE people may both blame themselves more for failure and be more prone to search for explanations.

The findings from this study add support to the model proposed by Shelton (1990) by showing (a) there is a substantial relationship between GSE and TSSE; (b) that failure at a task may influence on both TSSE and GSE through the attribution process, and (c) value seems to be important for understanding the relationship between GSE and TSSE. While Stanley and Murphy (1997) argued that since GSE is derived from TSSE the correlation between GSE and TSSE should be at least 0.5, it seems reasonable to expect that the magnitude of the correlation between GSE and TSSE will vary depending on the relevance of the specific task (or domain). Woodruff and Cashman (1993) proposed that efficacy exists at three levels; task-specific, domain and general. Hence when the interest is in a specific domain, a domain specific measure of self-efficacy may be more adequate as also proposed by Schwarzer *et al.* (1997). However, certain types of performance may be related to multiple aspects of self-efficacy, hence finding the optimal level of assessing self-efficacy is still a challenge (Lent *et al.*, 1997). Following Ajzen's (1988) argument that psychologists should study patterns of action, future research should be directed towards a better understanding of the relationship between different levels of self-efficacy and the role of potential goals and values in this process.

### *Note*

The English version of the GSE scale was translated to Norwegian by dr. Espen Røysamb applying the translation back-translation procedure.

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## APPENDIX I

*Skala for Opplevd Mestringsevne*

1. Jeg klarer alltid å løse vanskelige problemer dersom jeg forsøker hardt nok.
2. Dersom noen motarbeider meg, finner jeg måter for å få det som jeg vil.
3. Det er lett for meg å holde meg til mine planer og nå mine mål.
4. Jeg er sikker på at jeg kan mestre uventede hendelser.
5. Takket være mine ressurser, vet jeg hvordan jeg skal takle uforutsette situasjoner.
6. Jeg kan løse de fleste problem dersom jeg går inn for det.
7. Jeg er rolig når jeg møter vanskeligheter, fordi jeg stoler på min evne til å mestre dem.
8. Når jeg møter et problem, finner jeg vanligvis flere løsninger.
9. Dersom jeg er i knipe, finner jeg vanligvis en vei ut.
10. Samme hva some hender, er jeg som regel i stand til å takle det.

Respons alternativ:

1 = Ikke riktig      2 = Litt riktig      3 = Nokså riktig      4 = Helt riktig

## PAPER II

# Control Constructs: Do They Mediate the Relation between Educational Attainment and Health Behaviour?

ANETTE LEGANGER & PÅL KRAFT  
*Research Centre for Health Promotion, Faculty of  
Psychology, University of Bergen, Norway*

ANETTE LEGANGER is a doctoral candidate at the Research Centre for Health Promotion, Faculty of Psychology, University of Bergen. Her main research interests are in perceived control, self-efficacy theory and the relationship between SES and health behaviour.

PÅL KRAFT is professor in social psychology at the Institute of Psycho-Social Science, Faculty of Psychology, University of Bergen. His research interests include attitudes and behaviour, perceived control and persuasion.

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**ADDRESS.** Correspondence should be directed to:  
ANETTE LEGANGER, Research Centre for Health Promotion, Faculty of Psychology, University of Bergen, Christiesgt. 13, 5015 Bergen, Norway. [Tel. +47 55 58 98 94; Fax + 47 55 58 98 87; email: anette.leganger@psych.uib.no]

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## **Abstract**

Health promoting behaviours seem to be more prevalent among people with higher socio-economic status (SES). The main purpose of this article was to study (a) the relationship between education (as a dimension of SES) and intention and health behaviour (fruit/vegetable consumption), (b) the relationship between education and control conceptualizations (health locus of control (HLC), response-efficacy and self-efficacy) and (c) to what extent the relationship between education and intention/health behaviour (fruit/vegetable consumption) was mediated through different control beliefs. The results showed that women with higher education had higher intentions to consume fruit/vegetables and consumed fruit/vegetables more frequently. Higher education was associated with higher self-efficacy and response-efficacy beliefs and less belief in HLC-chance. These control beliefs partly mediated the education-intention/behaviour relationship.

## **Keywords**

*education, health-behaviour, intention, mediation, perceived control*

## Introduction

ALTHOUGH the social cognitive determinants of health behaviour have been extensively researched, the relationship between such determinants and dimensions of socio-economic status (SES) has received less attention. While it is assumed that social cognitive factors mediate the relationship between SES and health behaviour, few studies have addressed this issue empirically (Sheeran & Abraham, 1996). The main purpose of the present research was to study the relationship between educational attainment (as a dimension of SES) and fruit and vegetable consumption, the relationship between education and control beliefs and the extent to which different control beliefs mediate the relationship between education and intention/health behaviour (fruit/vegetable consumption).

### *SES and health behaviour*

In general, health promoting behaviours seem to be more prevalent among people with higher SES. Thus Pill, Peters and Robling (1995) reported that both women and men with higher SES had higher scores on seven health practices (e.g. never having smoked; no/moderate use of alcohol, eating breakfast regularly) as compared to those with lower SES. For women education was the most important SES factor (Pill et al., 1995). Of specific interest to the present study, is the observed SES gradient in the consumption of fruit and vegetables (F/V) (Dittus, Hillers, & Beerman, 1995; Hupkens, Knibbe, & Drop, 2000; Steptoe & Wardle, 1999). While the health authorities in many countries have made public recommendations for increased F/V consumption (such as 'five a day'), the diets of those with higher SES are more often in line with such dietary recommendations than that of people with lower SES (for an overview see Hupkens et al., 2000). For example, a study of British adults showed that while 49.7 percent of women in the higher occupational classes complied with a recommended F/V intake of 400g/day, this was the case for only 26.2 percent of the women in the lower occupational classes (Hunt, Nichols, & Pryer, 2000). Furthermore, Serdula, Coates, Byers, Simoes, Mokdad and Subar (1995) reported from a US study that while 17.4 percent of women with a level of education less

than high school reported to consume five F/V a day, the respective proportion was 27.8 percent in women holding a college graduate. Along the same line Steptoe and Wardle (1999) reported higher consumption of fruit, vegetables and fibre among those with higher education.

### *SES and perceived control*

Most (contemporary) health behaviour theories include some aspects of perceived control as determinants of health behaviour (Conner & Norman, 1996; Rutter & Quine, 1994). People who believe that they have 'control' over their lives are generally more likely to engage in health promoting behaviours and are less likely to engage in health-compromising behaviours (Norman, Bennett, Smith, & Murphy, 1998; Peterson & Stunkard, 1989). In this perspective it is interesting to note that a SES gradient in perceived control has been reported in several studies. For example, Cohen, Kaplan and Salonen (1999) reported that people with higher SES (income and education) reported higher perceived control over their lives, while Lachman and Weaver (1998) reported that people with higher income had higher mastery and lower perceived constraints. Sherer, Maddux, Mercandante, Prentice-Dunn, Jacobs and Rogers (1982) reported that men with higher SES (educational level, military rank) reported comparatively elevated self-efficacy beliefs while Leganger, Kraft and Røysamb (2000) reported on a weak positive relationship between education and self-efficacy, but only among women.

More generally, Clark (1996) has suggested that SES may influence both outcome and efficacy expectations. This is reflected by the fact that people with comparatively lower SES tend to ascribe more importance to 'external' factors such as faith, chance or powerful others as important determinants of their own health (Aarø, 1986; Chamberlain & O'Neill, 1998; Paxton & Sculthorpe, 1999; Wallston & Wallston, 1981). In this respect Marmot and Smith (1997) reported that a smaller proportion of people with low SES, as compared to those with high SES, believed that it was possible (by their own means) to reduce the risk of a heart attack. In another study Grembowski, Patrick, Diehr, Durham, Beresford, Kay and Hecht (1993) reported that people with lower SES showed

comparatively lower levels of both outcome and self-efficacy expectancies for health-related behaviours related to exercise, diet and weight. In conclusion it may seem plausible to expect that different control perceptions mediate the relationship between SES and health behaviour.

Adler, Boyce, Chesney, Cohen, Folkman, Kahn and Syme (1994) have suggested that different conceptualizations of control are needed in order to reveal in more detail the mechanisms through which perceived control influence upon health and health behaviour. In this respect Ellen Skinner (1996) has provided a useful categorization by suggesting that control constructs can be conceived of as representing three types of perceptions: agent-means, means-ends and agent-ends relations, respectively. In this perspective perceived control reflects an agent-ends relation involving the self as an agent, the self's behaviours as the means and the effected change as the outcome (Skinner, 1996).

### *Control as means-ends relations*

Although the terminology used varies considerably, most social cognition models of health behaviour include components representing means-ends relations. The object of control in this respect is the outcome or the reinforcement, and the notion of control has to do with an expected contingency between a health behaviour and health (consequences) as the outcome. This type of control does not imply that the actor actually perceives that she is able to perform a specific behaviour, but that she perceives that if the expected outcomes should be realized it would be as a consequence of personal behaviour. In social cognitive theory (SCT) this type of control is represented by outcome expectancies, i.e. 'a judgement of the likely consequences that performance will produce' (Bandura, 1997, p. 21), in protection motivation theory by response efficacy, i.e. the belief that a recommended response can remove a health threat (Boer & Seydel, 1996), and in the theory of planned behaviour outcome expectancies are represented in terms of behavioural beliefs linking (with specific probabilities) the behaviour to expected outcomes (Ajzen, 1988).

Health locus of control (HLC) may be conceived of as a more general or domain-specific reflection of means-ends beliefs. The multi-dimensional HLC-scales (MHLC)

measure health-specific locus of control along three dimensions: internal (individuals' beliefs in their ability to control their health); chance (the belief that chance or fate determines health outcomes); and powerful others (the belief that powerful others, for example health professionals, control one's health) (Norman & Bennett, 1996; Wallston & Wallston, 1981). Hence each HLC-dimension represents different types of means-ends relations; in internal the individual's behaviour represents the means, in the scales representing external locus of control, chance/fate and health professionals are seen as the means to health. The main prediction from HLC theory is that internals (those high on internal control) are more likely to engage in health promoting behaviours, while those with elevated HLC-chance beliefs are less likely to engage in health promoting behaviours (Norman & Bennett, 1996; Steptoe & Wardle, 2001). The specific role of powerful others seems to be less clear (Norman, Bennett, Smith, & Murphy, 1997). However, the HLC has not performed very well when it has been applied to predict specific health behaviours (Norman & Bennett, 1996; Norman et al., 1997; Wallston & Wallston, 1981). In the area of dieting HLC accounted for less than 5 percent of the variance in dietary choice. For consumption of fruit and vegetables chance emerged as the strongest predictor (Bennett, Moore, Smith, Murphy, & Smith, 1994). Norman et al. (1998) also found that the chance component was a more potent predictor of health behaviours (alcohol, smoking, exercise, diet), than was the internal component. However, in another study Norman (1995) reported that while behaviour-specific efficacy beliefs (outcome expectancies) predicted specific health behaviours, HLC-internal did not. This is not surprising since it is generally known that the more specific a construct is to a particular behaviour, the stronger the relationship between the belief and the behaviour would be expected to be (Ajzen & Fishbein, 1974; Steptoe & Wardle, 2001). While it might also be expected that those who believe that their health is determined by their own behaviour (HLC-internal) would have higher behaviour-specific efficacy beliefs, the relationship between HLC and behaviour-specific beliefs was not reported in this study (Norman, 1995).

Wallston (1991, 1992) has suggested that the role of HLC must be seen in relation to the value that people ascribe to the outcome (health). He has also strongly recommended combining HLC with other control expectancies, specifically self-efficacy. According to his modified social learning theory the probability for an individual to engage in health promotion behaviour is seen as a function of health value and perceived control. Thus locus of control is conceived of as only a part of the larger and more important construct of perceived control over health including both HLC and self-efficacy (Wallston, 1992; Wallston & Wallston, 1981; Wallston, Wallston, Smith, & Dobbins, 1987).

### *Control as agent-means and agent-ends relations*

Self-efficacy (SE) represents an agents-means relation, and the object of control is behaviour. It follows from social cognitive theory (Bandura, 1977, 1997) as well as from Wallston's modified social learning theory (Wallston, 1992) that although people may believe that outcomes (health) can be influenced by their own behaviour, they will not attempt to do this unless they also believe that they themselves can perform the behaviour successfully, i.e. that they have efficacy expectancies (Bandura, 1997). A large number of studies have confirmed the influential role that self-efficacy beliefs have upon intention and health behaviour (Conner & Norman, 1996; Schwarzer & Fuchs, 1995). In the area of fruit and vegetable consumption, for example Brug, Lechner and Devries (1995) found that self-efficacy emerged as the strongest predictor of intention to consume salads, boiled vegetables and fruit.

Like control over outcome/reinforcement control over behaviour (self-efficacy) can be conceptualized at different levels of generality (Leganger et al., 2000; Schwarzer, Bassler, Kwiatek, Schroder, & Zhang, 1997; Sherer et al., 1982; Woodruff & Cashman, 1993). While self-efficacy was first defined as a very specific construct 'the conviction that one can successfully execute the behavior required to produce the outcomes' (Bandura, 1977, p. 193), some authors have also conceptualized self-efficacy as a more general construct (Schwarzer, 1993; Shelton, 1990; Sherer et al., 1982); the belief of being able to master challenging demands by

means of adaptive action (Schroder, Schwarzer, & Konertz, 1998). As such general self-efficacy represents an agent-ends relation incorporating both competence and contingency, i.e. control over the behaviour and the outcome/reinforcement (that is caused by the behaviour). Within this perspective it is anticipated that people's appraisal of their efficacy in a specific domain is partly based on their judgements of their own general self-regulatory capabilities (Bandura, 1997). Consequently, some authors have argued that general beliefs of self-efficacy may be one source of information people use when judging their specific self-efficacy in relation to certain behaviour (Shelton, 1990; Watt & Martin, 1994). In line with this reasoning several studies have reported on a positive correlation between general and specific self-efficacy beliefs (although the magnitude of this relationship tends to vary considerably between studies) (Leganger et al., 2000; Røysamb, 1997; Schwarzer et al., 1997; Watt & Martin, 1994). Bandura, however, has strongly recommended that SE is measured specifically in relation to the behaviour of interest because SE is situation specific and tends to vary considerably across domains of functioning (Bandura, 1997).

### *Control constructs: do they mediate between SES and health behaviour?*

In a social cognitive perspective social psychological processes are seen as the means by which social inputs influence health outcomes (Brug et al., 1995; Conner & Norman, 1996; Rutter & Quine, 1994). However, while it appears that the social cognitive determinants of health behaviour have been extensively researched, the relationship between such determinants and SES has received less attention. While it is assumed that social cognitive factors mediate the relationship between SES and health behaviour, few studies have addressed this issue empirically (Sheeran & Abraham, 1996). As far as the whole 'causal' chain from SES, social cognitive mediators and health behaviour is concerned, this seems to have been the topic in only a very limited number of research articles. Hence Sheeran and Abraham (1996) have suggested that further research is needed to determine the impact of SES upon health beliefs and behaviour. The present study examined



these issues. The main purposes were: (a) to examine whether educational attainment (as a dimension of SES) is related to differences in intention and health behaviour (F/V-consumption); (b) to study how education was related to different control conceptualizations; (c) to study if these control beliefs mediated the relationship between education and intention/behaviour; and (d) to study if the relation between education and F/V-consumption was mediated by F/V-intention. The mediation hypothesis related to control would imply that the strength of the relation between education and F/V-intention would be significantly reduced when the control constructs were controlled for in the model. The mediation model thus suggests why and how certain effects will occur. It can be tested by means of a number of regression equations or as in the present study by means of model-fitting techniques (Baron & Kenny, 1986). The hypothesized model is shown in Fig. 1.

We expected a positive correlation between education and F/V consumption. Intention was expected to mediate the relationship between education and behaviour, while the control beliefs were expected to mediate the relationship between education and intention (Fig. 1). The relation between education and intention was expected to be significantly reduced when the general and specific control beliefs were introduced into the model (mediation hypothesis). The relation between education and F/V-consumption should be significantly

reduced when intention was introduced into the model.

**Participants**

From the population of 45-year-old women residing in the city of Bergen, Norway, 800 women were sampled at random from the official population registry by the Norwegian National Population Registry. Of these women 793 were available by mail and received a self-administered questionnaire together with a pre-addressed and stamped envelope in October 1999. The questionnaire included (among a number of issues) questions covering attitudes, perceived control and intentions to perform several health behaviours. One reminder was sent to non-responders. Four weeks later, the 793 women received a second questionnaire, mapping (among other issues) different health behaviours performed during the last four weeks. Again, one reminder was sent to non-responders. A total of 403 women responded to the first questionnaire (response rate 50.8 percent) and 329 (81.6 percent) of them (41.5 percent of the total sample) responded to the second questionnaire. These 329 women constitute the material for this study.

**Measures**

**Educational attainment** This is usually regarded as the most powerful SES predictor of health and health behaviour (Hupkens et al., 2000; Miech & Hauser, 2001; Pill et al., 1995; Steptoe & Wardle, 1999), and was thus chosen

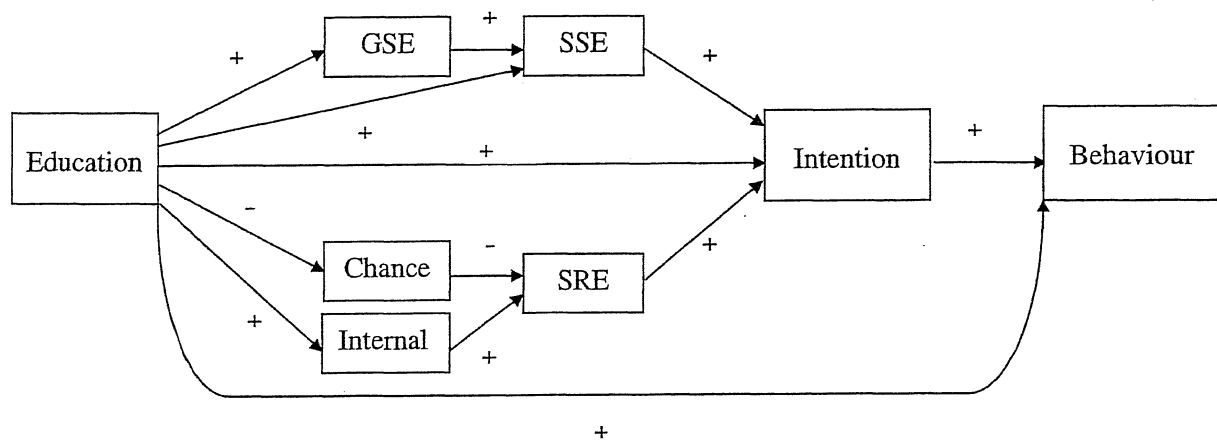


Figure 1. The hypothesized model.

GSE = general self-efficacy; Chance = chance health locus of control; Internal = internal health locus of control; SSE = specific self-efficacy; SRE = specific response efficacy

as an indicator of SES in the present study. Subjects reported their level of completed education on a five-point scale ranging from = < 9 years to = > 17 years: (1) = < 9 years (11.2%); (2) = 10–11 years (26.4%); (3) = 12 years (14.9%); (4) = 13–16 years (21.3%); (5) = > 17 years (25.2%); 0.9 percent (three subjects) did not report on their educational level.

**HLC** A short version of the health locus of control scales (Norman & Bennett, 1996; Normal et al., 1997) was applied (Norwegian version translated by Aarø, 1986). Hence, 'HLC-chance' and 'HLC-internal' were both measured by three items reported to on a six-point scale (anchored by strongly disagree and strongly agree). Because the 'powerful others' HLC-scale has been found to be less predictive of preventive behaviours (Wallston & Wallston, 1981; Wallston et al., 1987) it was not included in the present study.

**Specific response-efficacy (SRE)** Behaviour-specific means-ends beliefs were measured by three items: consuming fruit/vegetables at least three times a day will ... (a) increase my chances to stay healthy; (b) reduce my risk of getting cancer; and (c) improve my health. Responses were reported on five-point scales anchored by very unlikely and very likely.

**Generalized self-efficacy** The general self-efficacy scale (GSE) (Schwarzer, 1993) was applied (Norwegian version by Røysamb, Schwarzer, & Jerusalem, 1998). The scale consists of 10 items, assessing the strength of an individual's belief in his/her ability to respond to novel or difficult situations and/or to deal with any associated obstacles or setbacks (e.g. 'I can solve most problems if I invest the necessary effort'). Responses were reported on a four-point scale ranging from not at all true to exactly true.

**Specific self-efficacy expectancies (SSE)** Behaviour-specific agent-means beliefs (self-efficacy) were assessed in a similar way as described by Brug et al. (1995): I am confident that I can consume fruit/vegetables at least three times a day during the next four weeks even if ... (a) I want to consume something else; (b) it is difficult; and (c) I am busy. Responses were

reported on five-point scales anchored by disagree completely and agree completely.

**Intention** This was measured using three items: (a) I intend to consume fruit/vegetables at least three times a day during the next four weeks; (b) How likely is it that you will consume fruit/vegetables at least three times a day during the next four weeks? (c) I plan to consume fruit/vegetables three or more times a day during the next four weeks. Each item was rated on a five-point scale ranging from strongly agree/very likely to strongly disagree/very unlikely.

#### *F/V (fruit/vegetable) consumption (time 2)*

This was measured by one question: During the past four weeks, how often have you consumed fruit/vegetables? Responses were reported on a six-point scale: (1) = seldom/never; (2) = one–two times a week; (3) = three–six times a week; (4) = one–two times a day; (5) = three–four times a day; and (6) five or more times a day.

## Results

Descriptive statistics and bivariate correlations among constructs are presented in Table 1. As expected both intention ( $r = .25$ ;  $p < .001$ ) and F/V-consumption (T2) ( $r = .32$ ;  $p < .001$ ) was positively correlated with education.

There was a positive correlation between education and GSE ( $r = .21$ ;  $p < .001$ ), and a negative correlation between education and HLC-chance ( $r = -.25$ ;  $p < .001$ ). However no significant relationship was observed between education and HLC-internal. Education was positively correlated with SSE ( $r = .11$ ;  $p < .05$ ), and SRE ( $r = .15$ ;  $p < .01$ ).

The relations between the control constructs are reported in Table 1. As expected there was a positive correlation between GSE and SSE ( $r = .19$ ;  $p < .01$ ). The hypothesized positive correlation between HLC-internal and SRE was observed ( $r = .37$ ;  $p < .001$ ), as was the expected negative correlation between HLC-chance and SRE ( $r = -.15$ ;  $p < .01$ ).

In accordance with our expectations, both SSE ( $r = .32$ ;  $p < .001$ ) and SRE ( $r = .46$ ;  $p < .001$ ) were significantly related to F/V-intention. Furthermore, the expected relation between

Table 1. Descriptive statistics and Pearson's correlation (*r*) between variables

Variables	Descriptive statistics				Correlation coefficients							
	Range	Mean	SD	$\alpha$	1.	2.	3.	4.	5.	6.	7.	
1. Education	1-5	3.23	1.38									
2. F/V-consumption	1-6	3.96	0.99		.32***							
3. HLC-internal	1-6	4.60	0.85	0.69	.06	.09						
4. HLC-chance	1-6	3.09	1.14	0.58	-.25***	-.14**	.08					
5. GSE	1-4	2.68	0.61	0.91	.21***	.08	.22***	-.00				
6. Intention	1-5	3.63	1.30	0.96	.25***	.64***	.16**	-.11*	.13*			
7. SSE	1-5	3.37	1.34	0.88	.11*	.24***	.11	-.07	.19**	.32***		
8. SRE	1-5	4.07	0.93	0.92	.15**	.32***	.37***	-.15**	.09	.46***	.14*	

SD = Standard Deviation;  $\alpha$  = Cronbach alpha; \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

F/V-intention and F/V-consumption (time 2) was observed ( $r = .64; p < .001$ ).

**The mediation hypothesis**

In order to investigate the mediation hypothesis, path analysis was performed using AMOS 4.0 (Arbuckle & Wothke, 1995–99). Only subjects having no missing values were included in this analysis ( $n = 321$ ). Based on the hypotheses outlined in the introduction (Fig. 1) it was hypothesized that some of the effect of education on F/V-intention would be mediated through the control constructs. However in order for a variable to function as a mediator, there must be a strong relation between the predictor (education) and the mediating variable (control beliefs), and between the mediating variable and a criterion variable (intention and behaviour) (see Baron & Kenny, 1986). Since there was no significant relationship between education and HLC-internal, HLC-internal was not included in the path analysis.

The path from education to SSE was not significant and was removed from the model. The revised model (Fig. 2) provided excellent fit to the data as revealed by the fit indices: a non-significant  $\chi^2$  (11 d.f.); a normed fit index (NFI) of .97; a goodness of fit index (GFI) of .99; comparative fix index (CFI) of .99. The Root mean square error of approximation (RMSEA) was .019. The model explained 44 percent of the variance in T2 behaviour and 28 percent of the variance in intention (squared multiple correlations). The total effect of education upon behaviour was .32, the indirect effect was .15. The total

effect of education upon intention was .24, the indirect effect was .07. All the effect of the control constructs on behaviour was mediated through intention.

**Discussion**

The main purpose of the present research was to examine whether concepts related to perceived control mediate the relationship between education and intention/health behaviour.

As expected, the results showed a positive relationship between education (the predictor) and intention and behaviour (the outcomes). Overall education explained 6.3 percent of the variance in intention and 10.2 percent of the variance in fruit/vegetable consumption. The results confirmed previous research showing a social gradient in F/V-consumption, thus indicating that people with higher education consume more fruit/vegetables than those with lower education (Hunt et al., 2000; Hupkens et al., 2000).

**Education and perception of control**

Having confirmed the expected positive relationship between education and F/V-intention and consumption-behaviour, we next studied the relationship between education and perception of control as possible mediating variables. As expected there was a positive relationship between education and GSE indicating that there is a tendency that women with higher education have higher personal control

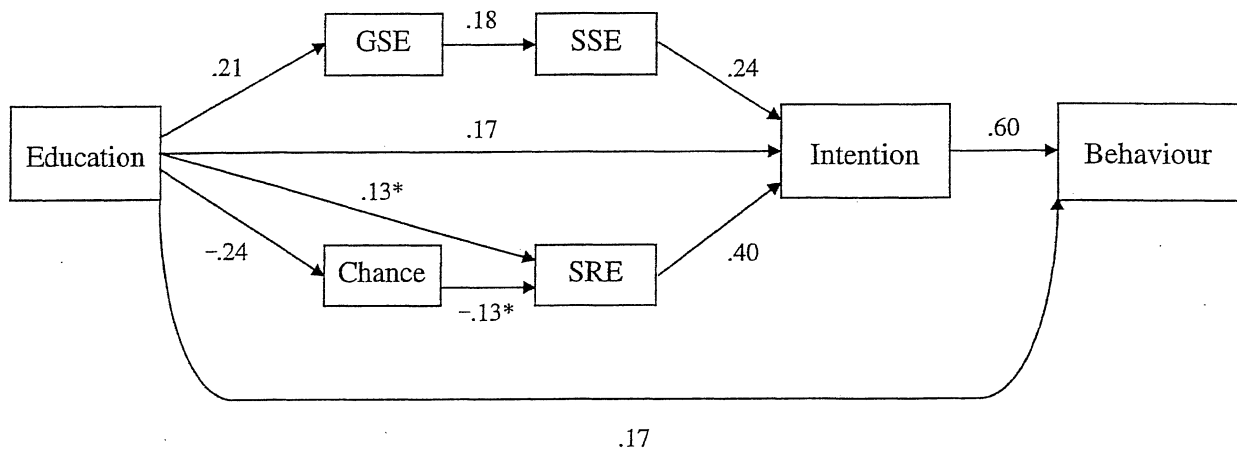


Figure 2. Path analysis of the mediated and direct effect of education upon fruit/vegetable consumption.

\* $p < 0.05$ , all other paths  $p < 0.01$

(agent-ends beliefs). Similar results have been reported for related concepts such as mastery (Bailis, Segall, Mahon, Chipperfield, & Dunn, 2001) and the perception of control over things that happen in one's life (Cohen et al., 1999). The positive relationship may reflect the fact that people from low vs. high SES have different opportunities and experiences in influencing events that affect their lives (Clark, 1996; Lachman & Weaver, 1998), resulting in different psychological styles (Cohen et al., 1999).

There was no association between education and HLC-internal. Hence in the domain of health the different educational groups did not differ in beliefs regarding whether their health was influenced by their own behaviour. However while acknowledging that health is influenced by what they themselves do, those with lower SES also have a more chance/fatalistic view on health and illness as indicated by the negative relationship between education and HLC-chance. Although this may seem a bit strange it is in accordance with previous empirical findings (Aarø, 1986; Paxton & Sculthorpe, 1999). The same pattern of results has been reported from qualitative studies as well and can be illustrated with a quotation from Chamberlain & O'Neill (1998): 'It's a lot of my responsibility. But when your number is dialled you have to answer the phone' (lower SES participant cited in Chamberlain & O'Neill, 1998, p. 1110).

### *Global and specific perceptions of control*

The results showed the existence of a relationship between general control beliefs, which are thought to be more stable across time and situations, and specific control beliefs. As expected there was a positive correlation between GSE and SSE which is also in accordance with previous studies (Leganger et al., 2000; Røysamb, 1997). This indicates that GSE exerts its influence upon specific intentions and behaviours via SSE (Leganger et al., 2000; Shelton, 1990; Watt & Martin, 1994). While personal experience with the behaviour is the most influential source of information people use when making an estimate of SSE, the way people interpret and integrate new information and experiences is influenced by their pre-existing self-schemata of personal efficacy. Hence people's efficacy appraisals for a given domain

may be partly based on judgement of their general self-regulatory capabilities (Bandura, 1997).

There was also a positive correlation between HLC-internal and SRE which both represents a means-end relation (with health behaviour as the means) and a negative correlation between HLC-chance and SRE. Hence those with high HLC-internal tended to believe more in the efficacy of F/V-consumption, while those who scored highly on HLC-chance believed less in the efficacy of F/V-consumption as a means to good health. A similar pattern of results has been reported for HLC and weight control (Paxton & Sculthorpe, 1999). The negative relationship between HLC-chance and fruit/vegetable-consumption, supports a strong role for HLC-chance in accordance with previous research (Norman et al., 1998; Paxton & Sculthorpe, 1999). Also Steptoe and Wardle (2001) reported that people with high beliefs in HLC-chance were less likely to consume fruit daily. Hence high beliefs in chance seems to be demotivating irrespective of beliefs regarding internal control (Paxton & Sculthorpe, 1999).

While global 'trait' measures (such as GSE, HLC) are most often weak predictors of specific intentions and behaviours (as opposed to behaviour specific control beliefs) the results from the present study supported the idea that a greater sense of control increases the likelihood of high outcome and efficacy expectations in specific situations (Clark, 1996). Hence while the effect on a single behaviour may be small the contribution across several domains and behaviours may be substantial (Leganger et al., 2000; Shelton, 1990; Steptoe & Wardle, 2001).

According to the social cognition models, intention is the most proximal determinant of behaviour. In the present study intention explained 40.9 percent of the variance in T2 behaviour. Povey, Conner, Sparks, James and Shepherd (2000) reported that intention to consume five portions of fruit and vegetables per day explained 32 percent of the variance in behaviour four weeks later while Brug et al. (1995) reported that intention explained between 7 percent and 27 percent of the variance of three dietary behaviours (salads, boiled vegetables and fruit). While the effect of other social cognitive variables e.g. attitudes, outcome-expectancies, response-efficacy should

be mediated through intention, self-efficacy may both have an indirect (through intention) and a direct effect upon behaviour. Our results showed that the effect of all the control variables were mediated through intention, which is similar to the Povey et al. study (2000). Both SRE and SSE predicted intention. While the total effect of SSE on intention was .24, the total effect of SRE was .40. Hence beliefs about the healthy consequences of the behaviour turned out to be more important than the belief that one can perform the behaviour successfully. This is apparently in contrast to other studies which have found self-efficacy to be the strongest predictor of fruit/vegetable consumption (Brug et al., 1995; Povey et al., 2000). Inconsistencies between studies may be due to differences in the way that self-efficacy is measured—both self-efficacy level and whether self-efficacy is measured as in the present study with three items or as a global measure. It is possible that using a single global assessment would make subjects arrive at an overall assessment of self-efficacy based on a consideration of all possible factors that may enhance or diminish control over the relevant behaviours.

### Mediation

As HLC-internal was not related to education this type of control did not function as a mediator between education and health behaviour in the present study. However GSE, SSE, HLC-chance and SRE partly mediated the relationship between education and intention, the two latter being most important. While relatively little of the effect of education upon F/V-consumption was mediated through control beliefs, Baron and Kenny (1986) have argued that partial mediation is acceptable and more realistic in social psychology. Similar results have been reported for other behaviours as well, thus Bailis et al. (2001) reported that perceived control partly mediated the relationship between SES and physical activity. Further, Janssen, De Wit, Stroebe and van Griensven (2000) reported that perceived behavioural control partly mediated the relationship between education and sexual behaviour. For fruit and vegetable consumption other factors such as price and familiarity have been shown to be related to both SES and behaviour and thus might also serve as mediators (Dittus et al.,

1995; Steptoe & Wardle, 1999). In conclusion we can only support the statement from Sheeran and Abraham (1996) that there is still need for further research to study the effects of cognitions and of non-psychological factors on social differences in health behaviour.

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## PAPER III

COPING WITH HEALTH RELATED MESSAGES: THE ROLE OF EDUCATIONAL  
LEVEL AND HEALTH CONSCIOUSNESS

Anette Christine Iversen

Pål Kraft<sup>1</sup>

Research Centre for Health Promotion, Faculty of Psychology, University of Bergen

<sup>1</sup>, Department of Psycho-Social Science, Faculty of Psychology, University of Bergen. Pål

Kraft is now at the Faculty of Psychology, University of Oslo

Running title: Coping with health messages

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Christine Iversen (former Leganger). The author thanks Maurice Mittelmark for comments on  
an earlier draft of this article. Correspondence concerning this article should be addressed to  
Anette Christine Iversen, Research Centre for Health Promotion, University of Bergen,  
Christiesgt. 13, 5015 Bergen, Norway. Phone: + 47 55 58 98 94 Fax: + 47 55 58 98 87.  
E-mail: [anette.iversen@psyhp.uib.no](mailto:anette.iversen@psyhp.uib.no)

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## Abstract

A sample of 45-year old women were asked how they usually react (cope) when exposed to health messages focusing on the relationship between health behaviours and health, especially the risk for developing cancer. The possible impact of women's education level and health consciousness on coping was studied and also motivational and emotional consequences of coping responses. Overall women reported more use of adaptive than non-adaptive coping. Educational level was significant negatively related to non-adaptive coping, while health consciousness was positively related to adaptive coping. Adaptive coping was positively, while non-adaptive was negatively related to intentions and subsequent behaviours (exercise and fruit and vegetable consumption). Women with lower education level tend to respond more non-adaptively to health messages, which have negative motivational and emotional consequences.

keywords:

Media, health behaviour, coping, education, health consciousness, intention

## INTRODUCTION

During the recent decades, the general population has been exposed to ever increasing amounts of health related information through the media (Pini, 1995; Russell, 1993). The mass media, newspapers and magazines in particular often include health issues among their focuses. People are often informed about various risk factors and encouraged by diverse information sources to adopt healthier lifestyles, such as increasing fruits and vegetable consumption and performing regular exercise (Atkin & Atkin, 1990; Bandura, 1997; Russell, 1993; Thompson, Margetts, Speller, & McVey, 1999). The potential of such behaviours in preventing future life threatening diseases such as cancer and heart attack is often emphasised.

However, the substantial amount of information provided by the media may possibly by some people be perceived as confusing and sometimes even contradictory (Gabhainn et al., 1999; Russell, 1993). This possibility has nourished a growing concern for a potentially negative impact of mass mediated health related information on parts of the population (Bandura, 1997; Pini, 1995; Russell, 1993). In this study a sample of 45-year old women were exposed to print media messages (selected from Norwegian newspapers) which focused on the relationship between the performance of certain health behaviours (consumption of fruits and vegetables, and exercise) and health, especially the risk for developing cancer. The respondents were asked to read the newspaper articles carefully. Subsequently, having these particular newspaper articles in mind, they were asked how they react (cope) when they are exposed to such health messages. The possible impact of the women's educational level and health consciousness on coping was studied along with motivational and emotional consequences of the coping responses. Subsequent health behaviour was assessed four weeks later.

*Coping with health related messages – emotional and motivational consequences*

The exposure to information that describes the relationship between health behaviour and health is probably often assumed to create a state of self-focused attention making people attend to or focus on their own health and health behaviours. Being in a state of self-focused attention, the individual is seen to generate self-relevant information, become aware of behavioural standards and aspirations, and make a comparison between «is and «ought» regarding salient self-aspects (Brown, 1998; Filipp, Aymanns, & Braukmann, 1986). If people perceive a discrepancy between their present behaviour and a recommended standard, they may experience a feeling of discomfort which they will be motivated to remove or reduce (Brown, 1998).

The feeling of discomfort that is possibly created when people are exposed to health messages may be reduced by the activation of certain coping responses. More generally, coping consist of cognitive and behavioural efforts to manage psychological stress(Lazarus, 1993). Coping is usually divided into two broad categories. A number of different labels have been used to name these coping categories, such as for example problem versus emotion-focused coping, approach versus avoidance, and active versus passive coping (De Ridder, 1997). While there may be no universally good or bad coping, it seems to be the case that some strategies seem to work better than others (Carver & Scheier, 1994; Lazarus, 1993).

One way to cope with the aversive feelings caused by thinking about the discrepancy between “is” and “ought”, is to shift ones attention away and try to avoid thinking about the subject matter (Brown, 1998). This strategy would be part of an emotion-focused, avoidant or passive coping response. A major problem, however, related to such avoidant coping strategies in terms of denial, self-distraction and mental disengagement, is that such coping

strategies seems to be related to negative emotions and poorer health outcomes (Penley, Tomaka, & Wiebe, 2002). Consequently these coping strategies have been classified as dysfunctional coping (Carver & Scheier, 1994). Within a health promotion perspective coping which do not directly manage the threat or deal with the reality of the situation, has been classified as maladaptive (Ripptoe & Rogers, 1987; Rogers & Prentice-Dunn, 1997; Self & Rogers, 1990). More precisely, this coping response to health messages would be maladaptive in two ways. First, because it may influence negatively the motivation to perform the behaviours recommended in the health message, i.e. to close the gap between “is” and “ought”. Secondly, although it is possible that avoidance coping may lead to a temporarily decrease in feelings of fear (Ripptoe & Rogers, 1987), it is likely that when the stressor/threat is a reoccurring phenomena such strategies will lead to an increase in the amount of negative emotions experienced. Consequently, when the women were exposed to the health messages we expected to observe empirically that increased levels of maladaptive coping was negatively related to future intentions to exercise and eat fruits and vegetables, but positively related to the levels of negative emotions that was experienced.

An alternative coping strategy when exposed to such health messages would be to try actively to close the gap between «is and «ought», in other words to (try to) change the relevant health behaviour so that it is in line with the recommended standard in the health message. From a health promotion perspective this option has been classified as an adaptive way of coping (Ripptoe & Rogers, 1987; Rogers & Prentice-Dunn, 1997). The reason is that this coping strategy has motivational consequences in terms of relating positively to future intentions and behaviours that are congruent with the recommendations given in the health message.

Additionally, by actually closing or reducing the gap between “is” and “ought”, the cause of the originally experienced discomfort will be removed (or reduced in strength). Hence, we

expected to observe that increased levels of adaptive coping was positively related to future intentions to exercise and eat fruits and vegetables, and negatively related to the levels of experienced negative emotions.

*Antecedents of coping - the role of educational level and health consciousness*

To cope with a perceived health threat involves the behaviours, cognitions, and perceptions in which people engage in to minimize the impact of the threat (Pearlin & Schooler, 1978; Schafer, Schafer, Bultena, & Hoiberg, 1993). Parrott (1995) have even suggested that people may seem to develop habitual or automatic ways of dealing with health related messages. Consequently Thompson, Margetts, Speller & McVey (1999) have suggested that there may be individual differences in the way that people respond to health messages. More generally, the way that people cope with a situation seems to be influenced by both characteristics of the person and the situation (Carver, Scheier, & Weintraub, 1989; De Ridder, 1997; Lazarus, 1993; Taylor & Seeman, 1999). McCrae (1984) reported that overall 2-16% of the variance in coping mechanisms could be accounted for by the type of stressor. Hence different categories of stressors, such as health related information might be associated with particular patterns of coping. Additionally, certain characteristics of the person seem to influence both appraisal of the situation and the coping strategies applied by the individual. Thus, psychological resources such as self-esteem, mastery and control, seem to be positively related to active problem solving coping and negatively related to avoidant coping strategies such as denial, behavioural and mental disengagement (Ben-Zur, 2002; Carver et al., 1989; Pearlin & Schooler, 1978).

While one must assume that the population in general has been exposed to and aware of health related information carried by the media, it may seem like people with higher levels of

education tend to follow recommendations for health related behaviours more often than those with lower levels of education. For example, Serdula et al.(1995) reported that while only 17.4% of women with less than high school education consumed five fruits/vegetables a day, 27.8% of women with college graduate did. Hence while the health authorities in many countries have made public recommendations such as “five fruits and vegetables a day”, the diet of those with higher levels of education is more often in line with these recommendations, as compared to those with lower levels of education (Hupkens, Knibbe, & Drop, 2000; Thompson et al., 1999). Several studies have also shown that physical inactivity is more prevalent among people with lower education (Cohen, Kaplan, & Salonen, 1999; Droomers, Schrijvers, Van de Mheen, & Mackenbach, 1998; Sjøgaard, Bøe, Klungland, & Jacobsen, 2000; Vaage, 1999). In Norway, Vaage (1999) reported that the proportion of physically inactive was 40% among those with the lowest level of education, compared to 20% among those with higher levels of education. People with higher educational level also tend to have more favourable health practises in general (e.g. never having smoked; no/moderate use of alcohol, eating breakfast regularly) than those with lower education (Pill, Peters, & Robling, 1995). In conclusion, it seems like people with higher educational level more often comply with recommendations for health related behaviours, as compared to those with lower levels of education. In this respect Ribisl, Winkleby, Fortmann, & Flora (1998) reported that higher educated men reported increased levels of consumption of health-related print media messages, and also that they engaged themselves more in interpersonal communication about cardiovascular disease and risk factors such as nutrition, exercise and smoking, as compared to men with lower levels of education. This may indicate that higher educated men respond more actively to health related media messages.



One explanation that may possibly partly contribute to this finding is that there is a relationship between educational level and the adoption of different coping strategies. More specifically, several authors have suggested the possible existence of a negative relationship between education and the use of maladaptive coping strategies (Taylor & Seeman, 1999). However, only a few studies have examined this relationship empirically, and the findings seem to be inconclusive (Taylor & Seeman, 1999). A study by Pearlin and Schooler (1978) showed that men and well educated people tended to use more efficacious coping strategies in general. While Ben-Zu (2002) reported that level of education was positively correlated with problem-focused coping and negative correlated with avoidance coping. Of particular interest to the present study was a study performed by Schafer, Schafer, Bultena, & Hoiberg (1993) concerning coping with the threat of unsafe food (e.g. bacteria/viruses, chemical residues etc). They reported that there was no relationship between coping and education, and the authors suggested that “personal” variables might seem to be more important than socio-demographic variables in explaining individual differences in coping.

One such individual factor would possibly be the extent to which people who attend to health messages find them to be personally relevant. When people perceive an issue as personally relevant they pay more attention, weigh the arguments presented and generate their own thoughts on the material (Parrott, 1995; Rosen, 2000). In this respect, it has been suggested that health consciousness (HC), the tendency to focus attention to one’s health should be related to health messages attention (Gould, 1990; Kaskutas & Greenfield, 1997). Research has indicated that people high in HC tend to have a healthier lifestyle. Hence Gould (1990) reported that HC was positively related to taking vitamins and avoid high calorie foods (but unrelated to exercise and jogging). Additionally, Jayanti and Burns (1998) reported on a positive relationship between health consciousness and the tendency to engage in number of

preventive health behaviours. Gould (1990) reported that people high in HC talked more about health and read health magazines and ingredient labels to a greater extent than those low in HC. However, they also tended to worry more about health and more often imagined that they had a dread disease. Another interesting finding reported from that study was that HC was not related to educational level or income. In apparent contrast to Gould (1990), Kaskutas and Greenfield (1997) did not find a relationship between HC and the recall of health messages, indicating that health messages also reach people who are less health conscious (it should however be noticed that their study was limited to messages and labels concerning alcohol). More interesting to the present research, Schafer et al (1993) reported on a positive relationship between HC and problem-focused coping with the threat of unsafe food.

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Insert figure 1 about here

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To sum up, we asked a sample of women to read carefully a selection of print media articles that described the relationship between certain health behaviours and the risk for developing cancer. Subsequently, we asked them about their (coping) reactions when exposed to such health messages. We expected to find that the use of adaptive coping strategies increased with increased levels of education and health consciousness, and that the use of non-adaptive coping strategies decreased with increased level of education. Furthermore, the motivational and emotional consequences of the different coping responses were studied. In this respect, we expected that adaptive coping would be positively associated with intentions and negatively associated with negative emotions, while non-adaptive coping would be negatively

related to intentions and positively related to negative emotions (Figure 1 sum up the hypothesised relationships).

## METHOD

### *Subjects and procedures*

From the population of 45-year-old women residing in the city of Bergen, Norway, 800 women were sampled at random from the official population registry by the Norwegian National Population Registry. 793 of these women were available by mail and received a self-administered questionnaire together with a pre-addressed and stamped envelope. One reminder was sent to non-responders. The questionnaire included (amongst a number of issues) two pages with copies of health related messages obtained from Norwegian newspaper articles. The messages covered issues such as the risk factors for cancer, possible health problems related to physical inactivity, and the benefits of increasing the consumption of fruits and vegetables. Subjects were asked to read carefully through the newspaper articles, and subsequently answered questions regarding coping, emotional reactions and intentions for future behaviours.

Four weeks later, the 793 women received a follow-up questionnaire mapping (amongst other issues) the frequency of exercise and fruit/vegetable consumption during the past four weeks. Again, one reminder was sent to non-responders. A total of 403 women responded to the first questionnaire (response rate 50.8 %), and 329 (81.6 %) of them (41.5 % of the total sample) responded to the second questionnaire. All 403 women were included in the analyses of data from the first round of data collection, while all analyses including behaviour were based on data from the 329 women who responded to the follow-up questionnaire.

### *Measures*

Subjects were asked to read the newspaper articles carefully. Subsequently, they reported how they usually reacted when they are confronted with mass media messages describing the relationship between health behaviours and the risk for developing cancer. Responses were measured by applying 16 items from the COPE instrument (Carver et al., 1989) (Norwegian version have been translated by Vollrath, Torgersen, & Alnaes, 1998). For the purpose of the present study, we included the active and planning subscales from COPE, as representing adaptive/functional coping, while items from the denial, mental and behavioural disengagement scales were included to represent non-adaptive/dysfunctional coping. Some of the items were slightly re-worded in order to tap more precisely coping reactions related to health related messages specifically (exact wording is reported in table 1). Responses were reported on a four-point scale ranging from “never” to “a lot”.

Education was measured by having subjects reporting their highest level of completed education: (1) = < 9 years (12.2%); (2) = 10-11 years (26.3%); (3) = 12 years (15.6%); (4) = 13-16 years (20.6%); (5) => 17 years (24.6%). Three subjects did not report their educational level.

Health consciousness was measured by applying a scale developed by Gould et al. (1990). The scale comprises 9-items, such as for example “I’m alert to changes in my health” and “I reflect about my health a lot”. The items were responded to on a 5-point scale anchored by “not at all typical” to “very typical”.

The intention to consume fruits/vegetables was measured by using three items: (a) “I intend to consume fruits/vegetables at least three times a day during the next four weeks”; (b) “How

likely is it that you will consume fruits/vegetables at least three times a day during the next four weeks?”, and; (c) “I plan to consume fruits/vegetables three or more times a day during the next four weeks”. Each item was rated on a 5-point scale ranging from “very unlikely” to “very likely”. The intention to exercise was measured by three items in a similar way.

After having read the health messages, the respondents were asked to report their experience of negative emotions. Negative emotions were measured by six items (distressed, scared, irritable, ashamed, nervous, afraid) from the Negative Affect Schedule (Watson, Clark, & Tellegen, 1988). Responses were reported on a five-point scale ranging from (1) “very slightly or not at all”, to (5) “extremely”.

#### *Behaviour (measured at follow-up)*

A follow-up questionnaire was mailed to the respondents about four weeks after the first questionnaire. The follow-up questionnaire included questions assessing relevant behaviours. Fruits/vegetables consumption was measured by one question: “During the past four weeks, how often have you consumed fruits/vegetables?” Responses were reported on a six point scale: (1) = “seldom/never”; (2) = “1-2 times a week”; (3) = “3-6 times a week”; (4) = “1-2 times a day”; (5) = “3-4 times a day”, and; (6) = “5 or more times a day”.

In a similar way exercise behaviour was measured by one question: “During the past four weeks, how often have you performed physical exercise?” Responses were reported on a five-point scale: (1) = “have not exercised”; (2) = “1-3 times the last four weeks”; (3) = “1 time a week”; (4) = “2 times a week”; (5) = “3 or more times a week”.

## RESULTS

The 16 coping items were subjected to a principal component analysis. Two factors with eigenvalues greater than 1.0 (4.6 and 3.1, respectively) were extracted, which explained 48.3 % of the total item variance. The scree- test also indicated that a two-factor solution was appropriate. All items from the original “active” and “planning” subscales loaded on the first factor, while items from the original “denial”, “mental disengagement” and “behavioural disengagement” subscales, loaded on the second factor (table 1). The finding that the items measuring “active” and “planning” loaded on a common factor is consistent with previous research on the original scale, while the three “dysfunctional scales” have in previous research been reported to load both on three separate factors, as well as on a common second order factor (Carver et al., 1989) . Hence, Carver has suggested that the dysfunctional scales can be used either separately or as broader dimensions, depending on the focus of the study. Based on this recommendation, results from previous research and the results of the factor analysis, two sum-score indices were constructed representing adaptive versus non-adaptive coping. There was no significant correlation between the two coping styles, indicating that they represent separate psychological phenomena. Overall subject reported more use of adaptive coping (mean = 2.31; SD = 0.61) than non-adaptive coping (mean = 1.50; SD=0.42).

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 Insert table 1 about here  
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Descriptive statistics and bivariate correlations among constructs are presented in Table 2. Education and health consciousness were positively correlated with intentions to consume F/V and exercise. Behavioural intentions were substantially and significantly correlated with

subsequent behaviours. Education was negatively correlated with non-adaptive coping. Hence, women with higher education were less likely to engage in non-adaptive coping when confronted with health related messages, while those with lower levels of education had an increased tendency to engage in non-adaptive coping. Education was also negatively correlated with negative emotions, indicating that those with lower levels of education experienced negative emotions more than those with higher levels of education. HC was positively correlated with adaptive coping, while there was no relationship between HC and non-adaptive coping. Additionally, there was no relationship between HC and negative emotions.

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Insert table 2 about here  
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As hypothesised adaptive coping was positively correlated with intentions to consume F/V and to exercise, while non-adaptive coping was negatively correlated with both intentions. In addition non-adaptive coping was positively correlated with negative emotions, while no relationship was observed between adaptive coping and negative emotions.

The hypothesised relationships that were supported by the correlation analysis were modelled in a path diagram, taking into account the finding from the factor analysis showing that adaptive and non-adaptive coping should be conceived of as separate constructs (Figure 2). To test the path diagram against the empirical data, we applied structural equation modelling (SEM), by means of AMOS 4.0 (Arbuckle & Wothke, 1995-99), based on the observed variance-covariance matrices. This approach integrate confirmatory factor analysis, multiple

regression and path analysis into one comprehensive framework, thereby comprising several advantages as compared to more traditional multivariate analysis (Kline, 1998). Specifically by modelling latent factors the importance of random measurement errors involved in ordinary sum-scores are reduced. SEM yields total fit measures indicating to what extent a hypothesised model is able to reproduce the observed empirical data (Kline, 1998; Schumacker & Lomax, 1996)

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Insert figure 2 about here  
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The path coefficients are comparable to standardised regression (Kline, 1998) coefficients (betas). The analysis showed that adaptive coping was predicted by HC (beta =.37), while non-adaptive coping was predicted by education (beta = -.33). Non-adaptive coping predicted negative emotions (beta=.42) and intentions (betas -.29 and -.30, respectively), while adaptive coping predicted intentions (betas .32 and .30, respectively). The total model provided excellent fit to the data, as indicated by the fit statistics which were calculated using an unconstrained independence model:  $\chi^2 = 246,13$ ;  $df = 146$ ,  $p < 0.001$ , a normed fit index (NFI) of 0.95 and a comparative fit index (CFI) of 0.98. The root mean square error of approximation (RMSEA) was 0.04. The model explained 18 % of the variance in intention to exercise and 18.5% of the variance in intention to consume F/V, while 42,9 % and 43,5 % of the variance of the two behaviours, respectively, was explained by the model.

We also tested a full model allowing for direct effects from HC to intentions and behaviours and from education to intentions, behaviour and negative emotions. Except for two significant



paths from education to F/V intention and behaviour, all other paths were non-significant. By including these two significant paths another 1% of the variance in intention and 2.2% of the variance in F/V consumption, was explained. The fit statistics of the model was slightly improved by adding these two paths ( $\Delta \chi^2 = 26,38$  ;  $df = 2$   $p < 0.001$ ).

## DISCUSSION

Overall the women in the present study reported more use of adaptive than non-adaptive coping strategies when they were exposed to mass mediated health messages. This was in accordance with previous research on how people cope with other types of stressors (Ben-Zur, 2002; Carver & Scheier, 1994; Carver et al., 1989). The actual levels of adaptive versus non-adaptive coping that were observed in the present study were also compatible with those reported in earlier studies. For example Carver & Scheier (1994) reported on mean values between 2.7 and 3.0 for adaptive coping and between 1.07 and 1.70 for non-adaptive coping regarding coping with an upcoming exam. Although an important exam might represent a stronger stressor than being exposed to mass mediated health messages, the results of the present study may seem to indicate that health messages comprise a stressor for adult/middle aged women. This was not totally surprising since health has been reported to represent an important part of the self domain in middle-age (Black, Stein, & Loveland-Cherry, 2001; Hooker & Kaus, 1994), while concerns with health seem to be more psychologically remote for younger people (Hooker & Kaus, 1994; Ripptoe & Rogers, 1987).

We observed that the two coping processes were unrelated, and they thus seem to represent distinct psychological processes. This is in keeping with previous research. Hence researchers have reported the two coping processes to be unrelated, to be weakly negatively related, or in

some cases to be weakly positively correlated (Ben-Zur, 2002; Carver et al., 1989; Jex, Bliese, Buzzell, & Primeau, 2001). The implication of these findings seem to be that people may use a wide range of coping strategies (simultaneously) (Carver et al., 1989; Lazarus, 1993). In the case of being exposed to health messages people may hence both start to think about the behaviours that would be congruent with the recommendations given in the health message, as well as start coping with the (expected) negative emotions following the exposure to such messages.

### *Education and coping*

While there was no relationship between education and adaptive coping, education was negatively correlated with non-adaptive coping. Negative relationship between education and non-adaptive coping has been reported in previous research addressing coping responses to other types of stressors. For example Pearlin & Schooler (1978) reported on a negative relationship between education and selective ignoring (an avoidant type of coping), while Ben-Zur (2002) reported on a (weak) negative correlation between education and avoidant coping. Since education is often used as an indication of socio-economic status (SES) (Droomers et al., 1998; Hupkens et al., 2000), the results of the present study seem to support the idea that there is a negative relationship between SES and non-adaptive coping (Taylor & Seeman, 1999).

The existence of a negative relationship between education and the use of non-adaptive coping strategies, adds to a more general picture of the existence of differences in psychosocial resources between people with different levels of education (and SES).

Accordingly, Cohen, Kaplan, & Salonen (1999) have suggested that people with different levels of socio-economic status develop different “psychological styles”. This seem to include

that people with lower SES have lower levels of self-esteem, mastery and control, which again relate negatively to the use of non-adaptive coping strategies (Ben-Zur, 2002; Carver et al., 1989; Pearlin & Schooler, 1978; Taylor & Seeman, 1999). Self-efficacy (Bandura, 1997) is one such psychological resource variable that in much research seems to be positively related to education (and SES) (Grembowski et al., 1993; Leganger & Kraft, 2003; Sherer et al., 1982) and which is usually reported to be negatively related to non-adaptive coping (Carver & Scheier, 1994; Jex et al., 2001; Ripptoe & Rogers, 1987; Schröder, Schwarzer, & Konertz, 1998). In an earlier study we reported that women with lower levels of education tend to have lower levels of both self- and response-efficacy for a number of health related behaviours (Leganger & Kraft, 2003). This may have serious consequences since high threat in combination with low self- and response-efficacy seem to be related to the use of maladaptive coping strategies (Ripptoe & Rogers, 1987; Rogers & Prentice-Dunn, 1997). Hence, if people think there is nothing to be done or that they will not be able to do what is necessary, they will tend to use non-adaptive coping responses when faced with a threat or challenge.

While a comparative lack of psychological resources may be one explanation for why those with lower levels of education engage in more non-adaptive coping, it is also possible that they perceive the health messages to be more threatening, than do those with higher levels of education. The substantial amount and often contradictory health messages that people are exposed to may turn out to be more confusing for those with lower levels of education. While those with higher education may be more able to critically evaluate this type of information and thus perceive health related messages as less threatening. Another explanation for lower threat among those with higher education may be that they already perform more health promoting behaviours (Leganger & Kraft, 2003; Pill et al., 1995; Serdula et al., 1995; Vaage,

1999), a finding which was confirmed in the present study. Hence, they may perceive less discrepancy between their present behaviour and the recommended standard outlined in the health messages. Consequently, they experience less discomfort and hence engage less in non-adaptive coping processes, as compared to women with lower levels of education. Additionally, when exposed to the health messages women with higher levels of education may more often feel that there is little need for them to cope adaptively (although they would probably have been able to if there was a need). This may explain why education was unrelated to adaptive coping. Still, with respect to health messages this finding may appear to be a bit odd taking into account previous research which has reported that people with higher as compared to lower education, tend to seek out more information and engage themselves more in interpersonal communication about health related issues (Gabhainn et al., 1999; Ribisl et al., 1998).

#### *Health consciousness*

HC was positively associated with fruit/vegetable consumption, but was unrelated with exercise behaviour. Similar results was reported by Gould (1990) who found that HC was positively related to taking vitamins and to avoid high calorie foods, but unrelated to exercise. Hence, it may seem that people who are high in HC are especially concerned with dietary behaviours. It was interesting to note that HC was unrelated to education, although a similar finding has been reported by (Gould, 1990). Hence, HC does not seem to mediate the (positive) relationship between educational level and the performance of certain health behaviours.

The hypothesised positive relationship between HC and adaptive coping was empirically confirmed and was in accordance with findings reported by Schafer et al.(1993). One possible explanation may be that health messages induce different cognitive responses in people with higher levels of HC. Hence they may find such messages to be more personally relevant, attend more to them, and think more (systematically) about the arguments and recommendations included in the health messages (Rosen, 2000). These results seem to be in agreement with the elaboration likelihood model (ELM) suggesting that people are more likely to process information thoughtfully when an issue is personally relevant (Petty & Cacioppo, 1990). In the present study, this seems to be the case even though people who are high (as compared to low) in HC already tend to perform more health promoting behaviours. The finding that HC was unrelated to non-adaptive coping and the experience of negative emotions, may on the other hand indicate that HC is different from health-anxiety which is often characterised by dysfunctional beliefs and fear and worry of illness and death (Lucock & Morley, 1996). On the contrary, HC seems to be functional in a health promoting perspective as it relates positively to adaptive coping and future intentions.

#### *Behavioural and emotional correlates of coping*

As expected, increased levels of non-adaptive coping was related to decreased levels of intentions to perform the health behaviours in the future and increased levels of experienced negative emotions, while adaptive coping was related to increased levels of intentions to perform health behaviours. This was in accordance with previous research. Hence, Droomers et al. (1998) reported that active problem solving coping was positively related to physical activity, while Ripptoe & Rogers (1987) reported on a negative relationship between avoidant coping and behavioural intention to perform breast self-examination. Additionally, a positive

correlation between avoidance coping and negative affect has also been reported by Ben-Zur (2002), while a recent meta-analysis by Penley, Tomaka & Wiebe (2002) showed that avoidance and wishful thinking was negatively correlated with health outcome. A long related, but different line of research Self & Rogers (1990) showed that if people believe that they cannot cope with a threat, increasing the level of threat may have a boomerang effect and actually decrease the intention to perform the health behaviour in the future. The present study indicates that increased levels of what we have denoted non-adaptive coping strategies both seem to increase the amount of negative emotions experienced, as well as influence negatively the motivation to perform the behaviours recommended in the health message, i.e. to close the gap between “is” and “ought”. Consequently, it seems to be adequate also in the field of health behaviour research to classify these coping strategies as dysfunctional or non-adaptive, and Carver & Scheier (1994p. 184) argue that “these avoidance types of coping typically work against people rather than to their advantage”. In contrast and as expected, adaptive coping related positively to future intentions. This option has been classified as an adaptive way of coping (Rogers & Prentice-Dunn, 1997) (Rippoe & Rogers, 1987), since it represents a coping strategy which implies that people will actively try to close the gap between «is and «ought», in other words to (try to) change the relevant health behaviour so that it is in line with the recommended standard in the health message.

Summing up, the results from the present study indicate that health related information might be perceived as stressful for middle-aged women. The way people respond seems to be influenced by both level of education and health consciousness. With respect to concern about increasing social inequalities in health behaviour, the tendency for women with lower education to respond to health messages with non-adaptive coping should be paid attention to, as this type of coping seems to have both negative emotional and behavioural consequences.

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Table 1

Descriptive statistics and factor loadings of coping items (rotated solution).

“Indicate what you usually do when you are exposed to information about health habits and cancer...”

Wording of item and original scale location	Factor loading	
	Mean	SD
I concentrate on work or other activities to take my mind away from my health habits	MD 1.69	.80
I concentrate my efforts on doing something with my health habits	A 2.42	.80
I say to myself this isn't true	D 1.35	.61
I admit to myself that I can't deal with it, and give up	BD 1.42	.63
I think about something else	MD 1.96	.80
I make a plan of action to improve my health habits	P 2.23	.83
I just give up trying to improve my health habits	BD 1.49	.63
I take additional action to do something with my health habits	A 2.45	.81
I refuse to believe in it	D 1.28	.56
I try to come up with a strategy about what to do	P 2.29	.86
I think about how I might best improve my health habits	P 2.54	.79

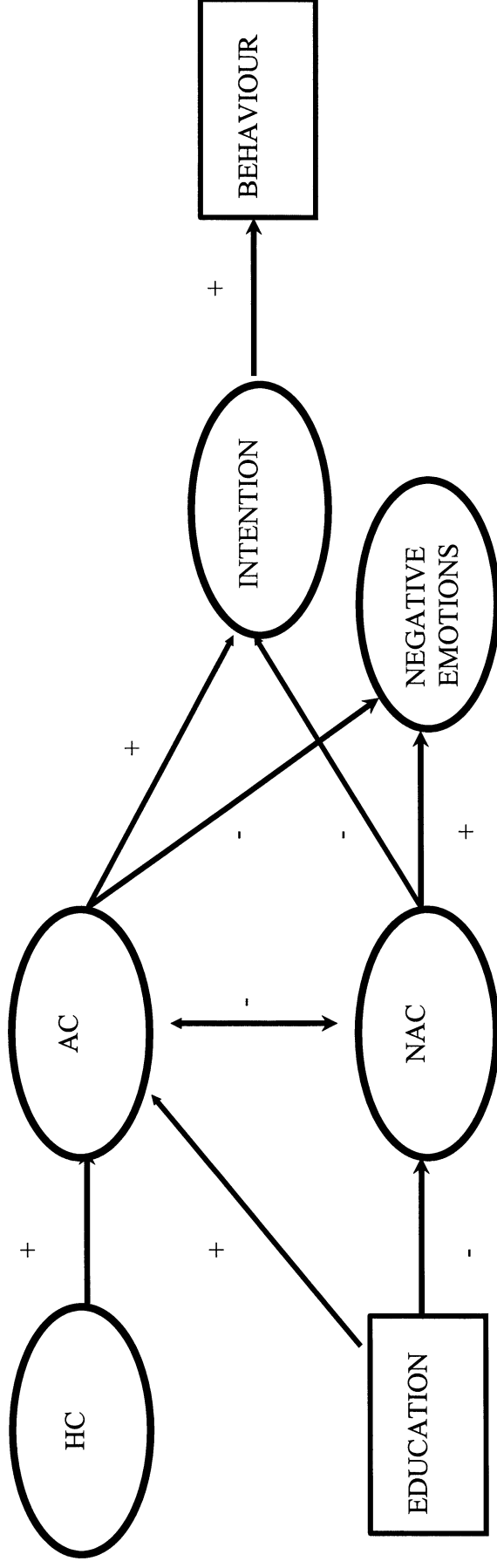
I take direct action to improve my health habits	A	2.07	.86	.78
I reduce the amount of effort I'm putting into improving my health habits	BD	1.47	.69	.55
I think hard about what steps to take	P	1.93	.82	.69
I pretend that I have never heard about it	D	1.21	.52	-.67
I do what has to be done, one step at a time	A	2.42	.81	.64
				-

MD = Mental Disengagement; BD = Behavioural Disengagement; D = Denial; A = Active Coping; P = Planning

Only loadings above .30 are reported in the table.

Figure 1

The hypothesised model



HC: Health consciousness

Intention: Intention to eat fruits/vegetables, exercise

Education: Educational level

Negative emotions: The experience of negative emotions when exposed to health messages

AC: Adaptive coping

Behaviour: Consumption of fruits/vegetables, exercise behaviour

NAC: Non-adaptive coping

Table 2

## Descriptive statistics and correlations between measures

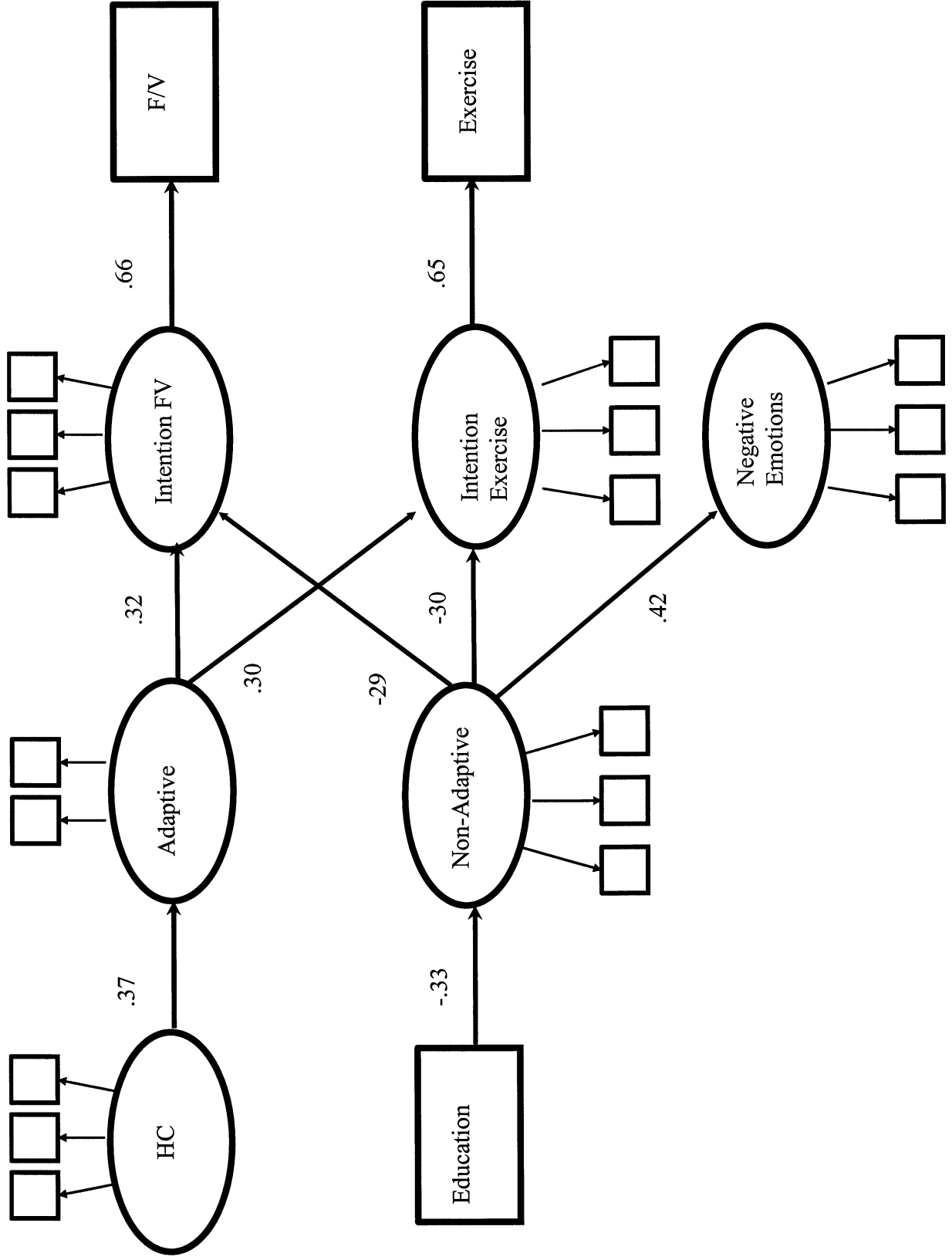
Variables	Mean	SD	$\alpha$	1	2	3	4	5	6	7	8
1.Adaptive coping	2.31	0.61	0.89								
2.Non-adaptive coping	1.50	0.42	0.76	.01							
3.Education	3.19	1.39		.03	-.25**						
4.Health consciousness	2.99	0.84	0.92	.32***	-.01	-.06					
5. F/V intention	3.57	1.31	0.96	.27***	-.23***	.24***	.18***				
6. Exercise intention	3.80	1.37	0.97	.26***	-.25***	.13*	.18***	.26***			
7.Negative emotions	1.48	0.58	0.77	.05	.31***	-.16**	.08	-.04	-.12*		
8.F/V-behaviour	3.96	0.99		.24***	-.23***	.32***	.15**	.64***	.29***	-.09	
9.Exercise behaviour	3.49	1.35		.14*	-.18**	.07	.07	.22***	.64***	-.09	.26***

$\alpha$  = Chronbach's alpha

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$



Figure 2: SEM model for the relationship between education, health consciousness, coping, emotions and behaviour



## Appendix

Questionnaire 1999



# UNIVERSITETET I BERGEN

HEMIL-senteret

*Senter for forskning om helsefremmende arbeid, miljø og livsstil*

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## Til kvinner i Bergen som fyller 45 år i 1999

Jeg er doktorgradsstipendiat ved HEMIL-senteret, Universitetet i Bergen. Jeg arbeider nå med et prosjekt hvor vi ønsker å forstå hvordan kvinner reagerer på informasjon og reportasjer om sammenheng mellom våre helsevaner (som f.eks trening og kosthold) og kreft.

Fra Folkeregisteret har vi fått trukket et tilfeldig utvalg av kvinner bosatt i Bergen kommune og du er altså en av dem. Vi håper du vil være villig å til å fylle ut dette spørreskjemaet og på den måten bidra til at vi får økt vår kunnskap og forståelse om dette viktige emnet.

Det er viktig at du prøver å svare på alle spørsmålene, selv om en del kan virke svært like. Spørreskjemaet vil bli lest maskinelt, sett derfor tydelig kryss i ruten for det svaret som passer best for deg, bruk svart eller blå penn.

Deltagelse i undersøkelsen er frivillig og du kan trekke deg når du vil. Vi har ingen kjennskap til den enkeltes helsestatus. Dersom du er i en situasjon som gjør at temaet er spesielt vanskelig for deg, beklager vi dette og ber deg se bort fra denne henvendelsen.

Om ca. en måned kommer vi til å sende deg et nytt spørreskjema med kun noen få spørsmål. For at vi skal kunne sammenholde svarene på de to skjemaene er det nødvendig at du merker skjemaene med en personlig kode. Denne koden er det bare du som kjenner, og besvarelsene dine er derfor anonyme.

Når du har fylt ut skjemaet, ber vi om at du postlegger det så snart som mulig, helst innen en uke etter at du mottok det. Du kan bruke den ferdig frankerte svarkonvolutten.

**De som besvarer begge skjema vil være med i trekningen om en gavesjekk på 3000 kroner.** Vinnerens kode vil bli kunngjort i Bergens Tidende 1. desember. Dersom du har spørsmål eller kommentarer kan du ringe Anette Leganger på tlf. 55 58 98 94.

Lykke til og på forhånd takk for innsatsen.

Vennlig hilsen

Anette Leganger  
Stipendiat

Pål Kraft  
Professor



1. **Skriv inn din personlige kode på følgende måte:**

- a) Skriv ned de to første bokstavene i ditt fornavn
- b) Skriv ned de to siste tallene i ditt telefonnummer.

Eks. Hvis du heter Anne og ditt private telefonnummer er 55 169990, blir din kode AN90

PERSONLIG KODE:

T

2. **Hva slags utdanning har du fullført?**

- 9-årig grunnskole eller kortere
- 1-2 år på videregående skole
- 3 år på videregående skole
- Høgskole eller universitet, mindre enn 4 år
- Høgskole eller universitet, mer enn 4 år

3. **Hva er din ekteskapelige status?**

- Ugift
- Gift
- Samboer
- Enke
- Separert/skilt

4. **Hva er for tiden husholdningens årsinntekt før skatt?**

- 100- 49.900 kr.
- 50.000- 99.900 kr.
- 100.000- 149.900 kr.
- 150.000- 199.900 kr.
- 200.000- 299.900 kr.
- 300.000- 399.900 kr.
- 400.000- 499.900 kr.
- 500.000 eller mer

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5. **Har du fulltids- eller deltidsjobb utenfor hjemmet?**

- Fulltidsjobb
- Deltidsjobb
- Arbeider ikke utenfor hjemmet

T

6. **Hvor mange barn har du ?**

(skriv tallet inni ruten)

 barn

7. **Hvor mange personer er der i husholdningen?**

(skriv tallet inni ruten)

 personer

8. **Stort sett vil du si at din helse er:**

- Utmerket
- Meget god
- God
- Nokså god
- Dårlig

T

9. **I løpet av den siste måneden hvor ofte har du spist frukt/grønnsaker?**

- Sjelden eller aldri
- 1-2 ganger i uken
- 3-6 ganger i uken
- 1-2 ganger om dagen
- 3-4 ganger om dagen
- minst 5 ganger om dagen

10. **I løpet av det siste halve året hvor ofte har du gjennomført selvundersøkelse av brystene ?**

- Aldri
- 1-2 ganger i løpet av siste halve året
- 3-4 ganger i løpet av siste halve året
- En gang i måneden
- Oftere enn en gang i måneden

11. **I løpet av den siste måneden hvor ofte har du trent/mosjonert ?**

- Har ikke trent/mosjonert
- 1-3 ganger løpet av siste måneden
- 1 gang i uken
- 2 ganger i uken
- 3 eller flere ganger i uken

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12. **Har du gjennomført selvundersøkelse av brystene i løpet av den siste måneden ?**

- Ja
- Nei

HVOR KARAKTERISTISKE ER DISSE UTSAGNENE FOR DEG?

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	T	Svært lite typisk					Svært typisk
		1	2	3	4	5	
13. Jeg prøver alltid å forstå meg selv.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
14. Stort sett er jeg ikke særlig oppmerksom på meg selv.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
15. Jeg reflekterer mye over meg selv.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
16. Fantasiene mine handler ofte om meg selv.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
17. Jeg gransker aldri meg selv.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
18. Jeg er stort sett oppmerksom på mine innerste følelser.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
19. Jeg undersøker hele tiden hvorfor jeg gjør ting.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
20. Noen ganger føler jeg at jeg ser meg selv utenfra.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
21. Jeg legger merke til forandringer i humøret mitt.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
22. Jeg er bevisst på hvordan jeg tenker når jeg løser et problem.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
23. Jeg tenker mye på helsen min.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
24. Jeg er veldig bevisst på helsen min.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
25. Jeg er stort sett oppmerksom på mine innerste følelser om helsen.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
26. Jeg undersøker hele tiden min egen helse.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
27. Jeg legger merke til forandringer i helsen min.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
28. Jeg er vanligvis oppmerksom på helsen min.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
29. Jeg er oppmerksom på helsetilstanden min gjennom en dag.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
30. Jeg legger merke til hvordan jeg føler meg fysisk i løpet av dagen.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
31. Jeg er veldig opptatt av helsen min.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

UNDER ER TI UTSAGN OM HVORDAN DU OPPFATTER DEG SELV. SETT KRYSS I DEN RUTEN SOM BEST BESKRIVER HVORDAN DU OPPFATTER DEG SELV. Sett kryss i boksen for veldig enig hvis du er helt enig med utsagnet. Sett kryss i boksen for enig , hvis du er enig men ikke helt. Sett kryss for uenig hvis du er uenig , men ikke helt. Sett kryss for veldig uenig hvis du tror utsagnet absolutt ikke beskriver måten du oppfatter deg selv.

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	T	Svært lite typisk				Svært typisk
		Veldig enig	Enig	Uenig	Veldig uenig	
32. I det store og hele er jeg fornøyd med meg selv.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
33. Av og til synes jeg at jeg ikke er noe tess i det hele tatt.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
34. Jeg synes jeg har mange gode kvaliteter.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
35. Jeg synes ikke jeg har mye å være stolt av.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
36. Jeg kan utføre ting like bra som andre folk.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
37. Av og til føler jeg meg virkelig unyttig.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
38. Jeg mener at jeg er verd noe, i alle fall like bra som andre.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
39. Jeg skulle ønske jeg hadde selvrespekt.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
40. Jeg tenker positivt om meg selv.	T	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
41. Stort sett har jeg en tendens til å føle at jeg er mislykket.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

HVOR RIKTIG ER DISSE PÅSTANDENE FOR DEG ?

		Ikke riktig	Litt riktig	Nokså riktig	Helt riktig
42.	Jeg klarer alltid å løse vanskelige problemer dersom jeg forsøker hardt nok.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43.	Dersom noen motarbeider meg, finner jeg måter for å få det som jeg vil.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44.	Det er lett for meg å holde meg til mine planer og nå mine mål	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45.	Jeg er sikker på at jeg kan mestre uventede hendelser.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
46.	Takket være mine ressurser, vet jeg hvordan jeg skal takle uforutsette situasjoner.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47.	Jeg kan løse de fleste problem dersom jeg går inn for det.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
48.	Jeg er rolig når jeg møter vanskeligheter, fordi jeg stoler på min evne til å mestre dem.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
49.	Når jeg møter et problem, finner jeg vanligvis flere løsninger.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50.	Dersom jeg er i knipe, finner jeg vanligvis en vei ut.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51.	Samme hva som hender, er jeg som regel i stand til å takle det.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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FOLK ER FORSKJELLIG NÅR DET GJELDER Å TA AVGJØRELSE, FOR HVERT UTSAGN VIL VI AT DU SKAL SETTE ET KRYSS I DEN RUTEN SOM BEST BESKRIVER HVORDAN DU ER NÅR DET GJELDER Å TA AVGJØRELSE

	Stemmer ikke	Stemmer som regel ikke	Stemmer noen ganger	Stemmer ofte	Stemmer helt
52.	Jeg kaster bort mye tid på trivielle ting før jeg foretar en endelig avgjørelse.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
53.	Selv etter jeg har tatt en avgjørelse venter jeg med å handle.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
54.	Jeg foretar ikke avgjørelser uten at jeg er nødt til det.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
55.	Jeg utsetter å ta avgjørelser til det er for sent.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
56.	Jeg viker unna å ta avgjørelser.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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NÅ KOMMER NOEN SPØRSMÅL SOM HAR MED HVORDAN DU SER DEG SELV I FRAMTIDEN. Noen ganger kan vi ha forestillinger/bilder av oss selv i framtiden. Noen kan være positive, det er den personen vi vil bli, andre kan være negative og være slike som vi frykter og ønsker å unngå.

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57. Hvor ofte forestiller du deg selv i framtiden som:

	Aldri	Sjelden	Av og til	Ganske ofte	Svært ofte
a) Aktiv	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Dårlig fysisk form	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Sunn og frisk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Dårlig helse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e) Stryk/vital	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
T f) Kreftsyk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

TA STILLING TIL DISSE PÅSTANDENE:

	T	Helt uenig	Nokså uenig	Litt uenig	Litt enig	Nokså enig	Helt enig
58.	Hvis det er slik at jeg skal bli syk, blir jeg det uansett hva jeg foretar meg.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
59.	Regelmessig kontakt med legen er den beste måten for meg å unngå sykdom på.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
60.	Når jeg ikke føler meg bra, bør jeg snakke med lege eller andre fagfolk på helsespørsmål.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
61.	Det som først og fremst virker inn på min helse, er det jeg gjør selv.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
62.	Min gode helse er stort sett et spørsmål om at jeg har lykken med meg.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
63.	Leger og andre fagfolk på helsespørsmål har kontrollen med min helse.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
64.	Hvis jeg tar vare på meg selv, kan jeg unngå sykdom.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
65.	Hvis jeg tar de riktige forholdsreglene, kan jeg holde meg frisk.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
66.	Hvis det nå engang er meningen at jeg skal være frisk, så vil jeg holde meg frisk.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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NÅ KOMMER NOEN UTKLIPP MED EKSEMPLER PÅ INFORMASJON OM HELSEVANER OG KREFT, LES GJENNOM DETTE FØR DU FYLLER UT RESTEN AV SPØRRESKJEMAET

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## Lite mosjon like farlig som å røyke

**Forskere ved idrettshøgskolen slår alarm: Mangel på mosjon er like skadelig for helsa som røyking, overvekt, høyt kolesterol og høyt blodtrykk - og nordmenn trener alt for lite.**

At hver tredje nordmann sjelden eller aldri mosjonerer, bekymrer. Det reduserte aktivitetsnivået i den norske befolkningen vil føre til en dårligere folkehelse, økt sykefravær og økte helseutgifter, spår fagpersoner ved Idrettshøgskolen. (NTB)

*Å bruke kroppen i arbeid eller fritid forebygger kreft. Fysisk aktivitet beskytter mot flere kreftformer hos både kvinner og menn. Over 40 studier viser at med økende fysisk aktivitet reduseres risikoen for å få tykktarmskreft med 30 – 40 prosent. Fysisk aktivitet ser også ut til å beskytte mot brystkreft. Studier fra flere land viser at brystkreftrisikoen reduseres med økende fysisk aktivitet i arbeid eller fritid.*

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## Du kan selv redusere kreftfaren

**Røyking og usunt kosthold er verst**

**Usunt kosthold. Mangel på vitaminer og mineraler i moderne mat. Lite fysisk aktivitet. Røyking. Ekspertene strides om hva som er verst i forhold til kreftrisiko. Ett effektivt råd er alle enige om: Stump røyken.**



Vitaminer og mineraler forlenger livet ditt. FOTO: Dagbladet

# Slik forebygger du kreft

Ny forskerrapport:

Verdens fremste krefteksperter har levert en rapport som viser at risikoen for alle typer kreft kan reduseres med opptil 40 prosent. Hemmeligheten er å bruke kosthold, kroppsvekt og trim som våpen. Ved å øke nordmenns inntak av frukt og grønnsaker med 65 prosent kan krefthyppigheten i Norge reduseres med 4000 tilfeller i året.

## 800 dør av brystkreft hvert år

Brystkreft tar årlig nesten 800 kvinneliv i Norge. Det er den viktigste dødsårsaken blant kvinner - den rager høyere enn både hjertesykdom og ulykker på statistikken.

Av TOVE KOLSET

Mandag 22. februar 1999 7:26

Jobb nummer én er landsdekkende masseundersøkelse med mammografi, mener brystkreftlege Bjørn Erikstein på Radiumhospitalet. 1 av 11 norske kvinner vil i løpet av livet få diagnosen brystkreft. Sykdommen er vår vanligste kvinnekreft, og rammer nå nesten 2500 kvinner hvert år.



**BRYSTOPERERT:** [redacted] får nytt bryst i på 50-årsdagen. Kari lever fem år etter at hun fikk brystkreft.

Foto: ARNE V. HOEM

Brystkreft har forholdsvis gode behandlingsutsikter når den oppdages tidlig. Det er derfor viktig at kvinner undersøker brystene sine hver måned, både ved å kjenne etter kuler og se etter andre forandringer.

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## Kreft i Norge

Hvert år får cirka 20000 norske menn og kvinner en kreftsykdom. Noe flere menn enn kvinner rammes, fordi flere menn får kreftformer som skyldes røyking.

Slik fordeler kreftformene seg i prosent på kvinner og menn:

### Kvinner

- Bryst: 23 %
- Tykk- og endetarm: 15%
- Lymfe- og blodkreft: 6%
- Lunge: 6%
- Eggstokk: 5%
- Malignt melanom: 5%
- Livmorlegeme: 5%
- Livmorhals: 4%
- Andre kreftformer: 31%

## Dette bør du gjøre

Direktør i Statens ernæringsråd, Gunn-Elin Aa. Bjørneboe, hevder at 30-40 prosent av all kreft kan forebygges ved hjelp av mosjon og kosthold.

Av GUNNAR HAGEN

Mandag 30. november 1998 6:43

Her er noen av Bjørneboes råd :

**SPIS FRUKT OG GRØNT:** Hovedprinsippet er å spise mye mer av alle typer frukt og grønt. Vi bør doble dosen. - Spis frukt og grønt fem ganger daglig. Du kan ikke få nok, sier Bjørneboe. **ANNEN MAT:** - Spis langt flere kornprodukter. Kvantumet kan med fordel også økes. Fisk er kjempebra, det samme er poteter. **DRIKKE:** - Drikk skummet melk. **MOSJON:** Vær i fysisk aktivitet mellom en halvtime og en time hver dag. Gå på jobb, sykle på jobb, ta deg en svømmetur om sommeren eller en skitur om vinteren. Ta trappa i stedet for heisen. En- to ganger i uka bør man trimme litt ekstra.

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FOLK REAGERER GJERNE FORSKJELLIG NÅR DE MØTER INFORMASJON OM HELSEVANER OG KREFT, VI ER INTERESSERT I DIN REAKSJON. Eksempel på slik informasjon er vist på de to foregående sidene og du bør ha lest dette før du fyller ut resten av spørreskjemaet.

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67. I hvilken grad opplever du informasjon om helsevaner og kreft som:

	I liten grad				I høy grad
	1	2	3	4	5
Truende	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Skremmende	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Utfordrende	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Irrelevant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Viktig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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68. Nedenfor kommer en rekke ord som beskriver ulike følelser. Les hvert ord og kryss av i den ruten som best passer for deg. Merk av i hvilken grad du føler slik nå, dvs i dette øyeblikk.

	Svært lite/ ikke i det hele tatt	Litt	Middels	En del	Mye
Interessert	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nedtrykt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sterk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Skremt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Irritabel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Årvåken	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Skamfull	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Inspirert	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nervøs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bestemt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Oppmerksom/konsentrert	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ukomfortabel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Anspent	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Engstelig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Kvalm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Redd	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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69. Sammenlignet med andre kvinner på din alder, hvor stor sjanse tror du det er for at du noen gang i livet får kreft? (sett kun ett kryss)

Mye høyere	Høyere	Noe høyere	Omtrent den samme	Noe lavere	Lavere	Mye lavere
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

ANGI HVA DU VANLIGVIS GJØR NÅR DU MØTER INFORMASJON OM HELSEVANER OG KREFT. SVAR PÅ HVERT AV UTSAGNENE VED Å SETTE ET KRYSS VED DET SVARET SOM PASSER FOR DEG. PRØV Å SVARE PÅ HVERT ENKELT UTSAGN UAVHENGIG AV ANDRE UTSAGN.

		Aldri	Litt	Noe	Mye
70.	Jeg konsentrerer meg om arbeid eller andre aktiviteter for å la være å tenke på helsevanene mine.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
71.	Jeg blir irritert og lar følelsene få fritt utløp.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
72.	Jeg samler mine krefter om å gjøre noe med helsevanene mine.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
73.	Jeg sier til meg selv at dette ikke er sant.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
74.	Jeg innrømmer ovenfor meg selv at jeg ikke kan hanskkes med det hele, og gir opp.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
75.	Jeg prøver å unngå å bli distraheret av andre tanker eller aktiviteter.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
76.	Jeg tenker på noe annet.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
77.	Jeg blir opphisset, noe jeg er helt klar over.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
78.	Jeg lager en plan for hvordan jeg skal forbedre mine helsevaner.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
79.	Jeg bare gir opp å prøve å forbedre helsevanene mine.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
80.	Jeg gjør nye anstrengelser for å prøve å bedre mine helsevaner.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
81.	Jeg nekter å tro på det.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
82.	Jeg prøver å se det hele i et nytt lys for å få det til å virke mer positivt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
83.	Jeg prøver å komme fram til en strategi når det gjelder hva jeg skal gjøre.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
84.	Jeg konsentrerer meg om å takle helsevanene mine og lar om nødvendig andre ting vente.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
85.	Jeg søker å se noe bra i det jeg leser om helsevaner og kreft.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
86.	Jeg tenker på hvordan jeg best skal takle å forbedre mine helsevaner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
87.	Jeg anstrenger meg for å hindre andre ting å komme i veien for min innsats for å bedre mine helsevaner.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
88.	Jeg opplever masse følelsesmessig ubehag, og disse følelsene uttrykker jeg i høy grad.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
89.	Jeg går rett på sak for å bedre mine helsevaner.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
90.	Jeg reduserer mine anstrengelser for å forbedre helsevanene mine.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
91.	Jeg skyver til side andre aktiviteter for å konsentrere meg om å forbedre mine helsevaner.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
92.	Jeg tenker hardt på hvilken skritt jeg skal ta.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
93.	Jeg later som jeg aldri har hørt om det.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
94.	Jeg gjør det som må gjøres, skritt for skritt.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
95.	Jeg lærer noe av det jeg leser om helsevaner og kreft.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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96. Sammenlignet med andre kvinner på din alder, hvor stor sjanse tror du det er for at du noen gang i livet får brystkreft? (sett kun ett kryss)

T	Mye høyere	Høyere	Noe høyere	Omtrent den samme	Noe lavere	Lavere	Mye lavere
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

TA STILLING TIL DISSE PÅSTANDENE/SPØRSMÅLENE OM SELVUNDERSØKELSE AV BRYSTENE:  
(sett ett kryss for hvert utsagn på en skala fra 1= svært usannsynlig til 5=svært sannsynlig)

		Svært usannsynlig					Svært sannsynlig
T		1	2	3	4	5	
97.	Jeg har til hensikt å gjennomføre selvundersøkelse av brystene i løpet av de neste fire ukene.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
98.	Hvor sannsynlig er det at du vil gjennomføre selvundersøkelse av brystene i løpet av de neste fire ukene?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
99.	Jeg planlegger å gjennomføre selvundersøkelse av brystene i løpet av de neste fire ukene.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
100.	Å gjennomføre selvundersøkelse av brystene i løpet av de neste fire ukene vil gjøre meg beroliget.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
101.	Å gjennomføre selvundersøkelse av brystene i løpet av de neste fire ukene vil gjøre at jeg tidlig kan oppdage om noe er galt, og dermed øke sjansene for å bli helbredet.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
102.	Å gjennomføre selvundersøkelse av brystene i løpet av de neste fire ukene vil gi meg trygghet om min helsetilstand.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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103. Å gjennomføre regelmessig selvundersøkelse av brystene i løpet av de neste fire ukene vil for meg være: (sett ett kryss for hver linje)

	1	2	3	4	5	6	7	
Dumt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Klokt
Skadelig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Verdifullt
Unyttig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Nyttig
Brysomt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lettvint
Problematisk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Uproblematisk

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I HVILKEN GRAD ER DU ENIG ELLER UENIG I DISSE PÅSTANDENE ?

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		Helt uenig					Helt enig
		1	2	3	4	5	
104.	Jeg er sikker på at jeg kan gjennomføre selvundersøkelse av brystene i løpet av de neste fire ukene.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
105.	Jeg er sikker på at jeg kan få en fast rutine på regelmessig selvundersøkelse av brystene.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
106.	Jeg er sikker på at jeg kan gjennomføre selvundersøkelse av brystene i løpet av de neste fire ukene selv om:						
	a) jeg ikke er sikker på hvordan jeg gjør det riktig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	b) jeg ikke synes det er nødvendig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	c) jeg ikke har lyst å bekymre meg	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

TA STILLING TIL DISSE PÅSTANDENE/SPØRSMÅLENE OM FRUKT OG GRØNNSAKER:

	svært usannsynlig				svært sannsynlig
	1	2	3	4	5
107. Jeg har til hensikt å spise frukt/grønnsaker minst tre ganger om dagen de neste fire ukene.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
108. Hvor sannsynlig er det at du vil spise frukt/grønnsaker minst tre ganger om dagen de neste fire ukene?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
109. Jeg planlegger å spise frukt/grønnsaker minst tre ganger om dagen de neste fire ukene.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
110. Å spise frukt/grønnsaker minst tre ganger om dagen vil øke mine sjanser for å holde meg frisk.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
111. Å spise frukt/grønnsaker minst tre ganger om dagen vil redusere risikoen for kreft.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
112. Å spise frukt/grønnsaker minst tre ganger om dagen vil gi meg bedre helse.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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113. Å spise frukt/grønnsaker minst tre ganger om dagen de neste fire ukene, vil for meg være:  
(sett ett kryss for hver linje)

T

	1	2	3	4	5	6	7	
Dumt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Klokt
Skadelig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Verdifullt
Unyttig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Nyttig
Brysomt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lettvint
Problematisk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Uproblematisk

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I HVILKEN GRAD ER DU ENIG ELLER UENIG I DISSE PÅSTANDENE ?

	Helt uenig				Helt enig
	1	2	3	4	5
114. Jeg er sikker på at jeg kan spise frukt/grønnsaker minst tre ganger om dagen de neste fire ukene.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
115. Jeg er sikker på at jeg kan få en fast rutine på å spise frukt/grønnsaker minst tre ganger om dagen.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
116. Jeg er sikker på at jeg kan spise frukt/grønnsaker minst tre ganger om dagen de neste fire ukene selv om:					
a) jeg har mer lyst på annen mat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) det er vanskelig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) jeg har det travelt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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TA STILLING TIL DISSE PÅSTANDENE/SPØRSMÅLENE OM REGELMESSIG TRENING/MOSJON:

		svært usannsynlig				svært sannsynlig
	T	1	2	3	4	5
117.	Jeg har til hensikt å trene/ mosjonere to ganger i uken i løpet av de neste fire ukene.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
118.	Hvor sannsynlig er det at du vil trene/mosjonere to ganger i uken de neste fire ukene ?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
119.	Jeg planlegger å trene/mosjonere to ganger i uken de neste fire ukene.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
120.	Å trene/mosjonere to ganger i uken vil øke mine sjanser for å holde meg frisk.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
121.	Å trene/mosjonere to ganger i uken vil redusere risikoen for kreft.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
122.	Å trene/mosjonere to ganger i uken vil gi meg bedre helse.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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123. Å trene/mosjonere to ganger i uken de neste fire ukene, vil for meg være:

	1	2	3	4	5	6	7	
Dumt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Klokt
Skadelig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Verdifullt
Unyttig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Nyttig
Brysomt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lettvint
Problematisk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Uproblematisk

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I HVILKEN GRAD ER DU ENIG ELLER UENIG I DISSE PÅSTANDENE ?

	Helt uenig				Helt enig	
	1	2	3	4	5	
124.	Jeg er sikker på at jeg kan jeg kan trene/ mosjonere to ganger i uken de neste fire ukene.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
125.	Jeg er sikker på at jeg kan få en fast rutine på å trene/mosjonere to ganger i uken.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
126.	Jeg er sikker på at jeg kan trene/mosjonere to ganger i uken de neste fire ukene selv om:					
	a) det er noe bra på TV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	b) jeg føler meg trett	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	c) jeg har dårlig tid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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Når du nå er ferdig, ber vi deg legge skjemaet i den ferdig frankerte svarconvolutten og postlegge det med en gang. Om ca. en måned sender vi deg det andre spørreskjemaet, det består kun av en side.

Tusen takk for hjelpen!

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**Doctoral Theses at The Faculty of Psychology,**  
**University of Bergen**

1979-1980	Allen, H.M., Dr. philos.	Parent-offspring interactions in willow grouse ( <i>Lagopus L. Lagopus</i> ).
1981-1982	Myhrer, T., Dr. philos.	Behavioral Studies after selective disruption of hippocampal inputs in albino rats.
1982-1983	Svebak, S., Dr. philos.	The significance of motivation for task-induced tonic physiological changes.
	Myhre, G., Dr. philos.	The Biopsychology of behavior in captive Willow ptarmigan.
	Eide, R., Dr. philos.	PSYCHOSOCIAL FACTORS AND INDICES OF HEALTH RISKS. The relationship of psychosocial conditions to subjective complaints, arterial blood pressure, serum cholesterol, serum triglycerides and urinary catecholamines in middle aged populations in Western Norway.
	Værnes, R.J., Dr. philos.	Neuropsychological Effects of Diving.
1983-1984	Kolstad, A., Dr. philos.	Til diskusjonen om sammenhengen mellom sosiale forhold og psykiske strukturer. En epidemiologisk undersøkelse blant barn og unge.
1984-1985	Løberg, T., Dr. philos.	Neuropsychological assessment in alcohol dependence.
1985-1986	Hellesnes, T., Dr. philos.	Læring og problemløsning. En studie av den perseptuelle analysens betydning for verbal læring.
	Håland, W., Dr. philos.	Psykoterapi: relasjon, utviklingsprosess og effekt.
	Hagtvet, K.A., Dr. philos.	The construct of Test Anxiety: Conceptual and Methodological Issues.
1986-1987	Jellestad, F.K., Dr. philos.	Effects of neuron specific amygdala lesions on fear-motivated behavior in rats.
	Aarø, L.E., Dr. philos.	Health Behaviour and Socioeconomic Status. A Survey among the adult population in Norway.
	Underlid, K., Dr. philos.	Arbeidsløse i psykososialt perspektiv.
	Laberg, J.C., Dr. philos.	Expectancy and classical conditioning in alcoholics' craving.

1987-1988	Vollmer, F.C., Dr. philos.	Essays on explanation in psychology.
	Ellertsen, B., Dr. philos.	Migraine and Tension Headache: Psychophysiology, Personality and Therapy.
	Kaufmann, A., Dr. philos.	Antisosial atferd hos ungdom. En studie av psykologiske determinanter.
	Mykletun, R.J., Dr. philos.	Teacher Stress.
1988-1989	Havik, O.E., Dr. philos.	After the myocardial infarction: A medical and psychological study with special emphasis on perceived illness.
1989-1990	Bråten, S., Dr. philos.	Menneskedyaden. En teoretisk tese om sinnets dialogiske natur med informasjons- og utviklingspsykologiske implikasjoner sammenholdt med utvalgte spedbarnsstudier.
	Wold, B., Dr. psychol.	Lifestyles and physical activity. A theoretical and empirical analysis of socialization among children and adolescents.
1990-1991	Flaten, M.A., Dr. psychol.	The role of habituation and learning in reflex modification.
	Alsaker, F.D., Dr. philos.	Global negative self-evaluations in early adolescence.
	Kraft, P., Dr. philos.	AIDS prevention in Norway. Empirical studies on diffusion of knowledge, public opinion, and sexual behaviour.
1991-1992	Endresen, I.M., Dr. philos.	Psychoimmunological stress markers in working life.
	Faleide, A.O., Dr. philos.	Asthma and Allergy in Childhood. Psychosocial and Psychotherapeutic Problems.
	Dalen, K., Dr. philos.	Hemispheric Asymmetry and the Dual-Task Paradigm: An Experimental Approach.
	Bø, I.B., Dr. philos.	Ungdoms sosiale økologi. En undersøkelse av 14-16 åringers sosiale nettverk.
	Nivison, M.E., Dr. philos.	The Relationship between Noise as an Experimental and Environmental Stressor, Physiological Changes and Psychological Factors.
1992-1993	Torgersen, A.M., Dr. philos.	Genetic and environmental influence on temperamental behaviour. A longitudinal study of twins from infancy to adolescence.
	Larsen, S., Dr. philos.	Cultural background and problem drinking.

	Nordhus, I.H., Dr. philos.	Family caregiving. A community psychological study with special emphasis on clinical interventions.
1993-1994	Thuen, F., Dr. psychol.	Accident-related behaviour among children and young adolescents: Prediction and prevention.
	Solheim, R., Dr. philos.	Spesifikke lærevansker. Diskrepanskriteriet anvendt i seleksjonsmetodikk.
	Johnsen, B.H., Dr. psychol.	Brain assymetry and facial emotional expressions: Conditioning experiments.
	Tønnessen, F.E., Dr. philos.	The etiology of Dyslexia.
	Kvale, G., Dr. psychol.	Psychological factors in anticipatory nausea and vomiting in cancer chemotherapy.
	Asbjørnsen, A.E., Dr. psychol.	Structural and dynamic factors in dichotic listening: An interactional model.
1994-1995	Bru, E., Dr. philos.	The role of psychological factors in neck, shoulder and low back pain among female hospitale staff.
	Braathen, E.T., Dr. psychol.	Prediction of excellence and discontinuation in different types of sport: The significance of motivation and EMG.
	Johannessen, B.F., Dr. philos.	Det flytende kjønnet. Om lederskap, politikk og identitet.
	Sam, D.L., Dr. psychol.	Acculturation of young immigrants in Norway: A psychological and socio-cultural adaptation.
	Bjaalid, I.-K., Dr. philos	Component processes in word recognition.
	Martinsen, Ø., Dr. philos.	Cognitive Style and Insight.
	Nordby, H., Dr. philos.	Processing of auditory deviant events: Mismatch negativity of event-related brain potentials.
	Raaheim, A., Dr. philos.	Health perception and health behaviour, theoretical considerations, empirical studies, and practical implications.
	Seltzer, W.J., Dr.philos.	Studies of Psychocultural Approach to Families in Therapy.
Brun, W., Dr.philos.	Subjective conceptions of uncertainty and risk.	
1995-1996	Anderssen, N., Dr. psychol.	Physical activity of young people in a health perspective: Stability, change and social influences.
	Bjørkly, S., Dr. psychol.	Diagnosis and Prediction of Intra-institutional Aggressive Behaviour in Psychotic Patients
	Aas, H.N., Dr. psychol.	Alcohol Expectancies and Socialization: Adolescents learning to drink.



	Sandal, Gro Mjeldheim, Dr.psychol.	Coping in Extreme Environments: The Role of Personality
	Strumse, Einar, Dr. philos.	The psychology of aesthetics: explaining visual preferences for agrarian landscapes in Western Norway.
	Hestad, Knut, Dr. philos.	Neuropsychological deficits in HIV-1 infection.
1996-1997	Lugoe, L.Wycliffe, Dr. philos.	Prediction of Tanzanian Students' HIV Risk and Preventive Behaviours
	Sandvik, B. Gunnhild, Dr. philos.	Fra distriktsjordmor til institusjonsjordmor. Fremveksten av en profesjon og en profesjonsutdanning
	Lie, Gro Therese, Dr. psychol.	The Disease that Dares Not Speak its Name: Studies on Factors of Importance for Coping with HIV/AIDS in Northern Tanzania
	Øygard, Lisbet, Dr. philos.	Health behaviors among young adults. A psychological and sociological approach
	Stormark, Kjell Morten, Dr. psychol.	Emotional Modulation of Selective Attention: Experimental and Clinical Evidence.
	Einarsen, Ståle, Dr. psychol.	Bullying and harassment at work: epidemiological and psychosocial aspects.
	Knivsberg, Ann-Mari, Dr.philos.	Behavioural abnormalities and childhood psychopathology: Urinary peptide patterns as a potential tool in diagnosis and remediation.
	Eide, Arne H., Dr.philos	Adolescent drug use in Zimbabwe. Cultural orientation in a global-local perspective and use of psychoactive substances among secondary school students.
	Sørensen, Marit, Dr.philos	The psychology of initiating and maintaining exercise and diet behaviour.
	Skjæveland, Oddvar, Dr.psychol.	Relationships between spatial-physical neighborhood attributes and social relations among neighbors.
	Zewdie, Teka, Dr.philos	Mother-child relational patterns in Ethiopia. Issues of developmental theories and intervention programs.
	Wilhelmsen, Britt Unni, Dr.philos	Development and evaluation of two educational programmes designed to prevent alcohol use among adolescents.
1997/1998	Manger, Terje, Dr.philos	Gender differences in mathematical achievement among Norwegian elementary school students.
	Lindstrøm, Torill Christine, Dr.philos	«Good Grief»: Adapting to Bereavement.
	Skogstad, Anders, Dr.philos	Effects of leadership behaviour on job satisfaction, health and efficiency
	Haldorsen, Ellen M. Håland, Dr.psychol	Return to work in low back pain patients

	Besemer, Susan P. Dr.philos	Creative Product Analysis: The Search for a Valid Model for Understanding Creativity in Products.
1998/1999	Winje, Dagfinn, Dr.psychol	Psychological adjustment after severe trauma. A longitudinal study of adults' and children's posttraumatic reactions and coping after the bus accident in Måbødalen, Norway 1988.
	Vosburg, Suzanne K., Dr.philos	The effects of mood on creative problem solving
	Eriksen, Hege R., Dr.philos	Stress and coping: Does it really matter for subjective health complaints?
	Jakobsen, Reidar, Dr.psychol -	Empiriske studier av kunnskap og holdninger om hiv/aids og den normative seksuelle utvikling i ungdomsårene.
	Mikkelsen, Aslaug, Dr.philos	Effects of learning opportunities and learning climate on occupational health.
	Samdal, Oddrun, Dr.philos	The school environment as a risk or resource for students' health-related behaviours and subjective well-being.
	Friestad, Christine, Dr.philos	Social psychological approaches to smoking.
	Ekeland, Tor-Johan, Dr.philos	Meining som medisin. Ein analyse av placebofenomenet og implikasjoner for terapi og terapeutiske teoriar.
1999/2000	Saban, Sara, Dr.psychol	Brain Asymmetry and Attention: Classical Conditioning Experiments.
	Carlsten, Carl Thomas, Dr.philos	God lesing – God læring. En aksjonsrettet studie av undervisning i fagtekstlesing.
	Dundas, Ingrid, Dr.psychol	Functional and dysfunctional closeness. Family interaction and children's adjustment.
	Engen, Liv, Dr.philos -	Kartlegging av leseferdighet på småskoletrinnet og vurdering av faktorer som kan være av betydning for optimal leseutvikling.
	Hovland, Ole Johan, Dr.philos	Transforming a self-preserving "alarm" reaction into a self-defeating emotional response: Toward an integrative approach to anxiety as a human phenomenon.
	Lillejord, Sølvi, Dr.philos	Handlingsrasjonalitet og spesialundervisning. En analyse av aktørperspektiver.
	Sandell, Ove, Dr.philos	Den varme kunnskapen.
	Oftedal, Marit Petersen, Dr. philos	Diagnostisering av ordavkodingsvansker: En prosessanalytisk tilnæringsmåte.

2000/2001	Sandbak, Tone, Dr.psychol	Alcohol Consumption and Preference in the Rat: The Significance of Individual Differences and Relationships to Stress Pathology
	Eid, Jarle, Dr.psychol	Early Predictors of PTSD Symptom Reporting; The significance of contextual and individual factors
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	Skinstad, Anne Helene, Dr.philos	Substance Dependence and Borderline Personality Disorders
	Binder, Per-Einar, Dr.psychol	Individet og den meningsbærende andre. En teoretisk undersøkelse av de mellommenneskelige forutsetningene for psykisk liv og utvikling med utgangspunkt i Donald Winnicotts teori
	Roald, Ingvild K., Dr.philos	Building of Concepts. A Study of Physics concepts of Norwegian Deaf students
2001/2002	Fekadu, Zelalem W., Dr.philos	Predicting contraceptive use and intention among a sample of adolescent girls. An application of the theory of planned behaviour in Ethiopian context
	Melesse, Fantu, Dr.philos	The more intelligent and sensitive child (MISC) mediational intervention in an Ethiopian context: An evaluation study
	Råheim, Målfrid, Dr.philos	Kvinnerns kroppserfaring og livssammenheng. En fenomenologisk – hermeneutisk studie av friske kvinner og kvinner med kroniske muskelsmerter
	Engelsen, Birthe Kari, Dr.psychol	Measurement of the eating problem construct
	Lau, Bjørn, Dr.philos	Weight and Eating Concerns in Adolescence
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	Ihlebak, Camilla, Dr.philos	Epidemiological Studies of Subjective Health Complaints
	Rosén, Gunnar O. R., Dr.philos	The phantom limb experience. Models for understanding and treatment of pain with hypnosis
	Høines, Marit Johnsen, Dr.philos	Fleksible språkrom. Matematikklæring som tekstutvikling
	Anthun, Roald Andor, Dr.philos	School psychology service quality. Consumer appraisal, quality dimensions, and collaborative improvement potential
	Pallesen, Ståle, Dr.psychol	Insomnia in the elderly. Epidemiology, psychological characteristics and treatment
	Midthassel, Unni Vere, Dr.philos	Teacher involvement in school development activity. A study of teachers in Norwegian compulsory schools
	Kallestad, Jan Helge, Dr.philos	Teachers, schools and implementation of the Olweus Bullying Prevention Program
2002-2003	Ofte, Sonja Helgesen, Dr.psychol	Right-left discrimination in adults and children
	Netland, Marit, Dr.psychol	Exposure to political violence. The need to estimate our estimations

	Diseth, Åge, Dr.psychol	Approaches to learning: Validity and prediction of academic performance
	Bjuland, Raymond, Dr.philos	Problem solving in geometry. Reasoning processes of student teachers working in small groups: A dialogical approach
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	Arefjord, Kjersti, Dr.psychol	After the myocardial infarction – the wives' view. Short- and long-term adjustment in wives of myocardial infarction patients
	Ingjaldsson, Jón Þorvaldur, Dr.psychol	Unconscious Processes and Vagal Activity in Alcohol Dependency
	Holden, Børge, Dr.philos	Følger av atferdsanalytiske forklaringer for atferdsanalysens tilnærming til utforming av behandling
	Holsen, Ingrid, Dr.philos	Depressed mood from adolescence to 'emerging adulthood'. Course and longitudinal influences of body image and parent-adolescent relationship
	Hammar, Åsa Karin, Dr.psychol	Major depression and cognitive dysfunction- An experimental study of the cognitive effort hypothesis
	Sprugevica, Ieva, Dr.philos	The impact of enabling skills on early reading acquisition
	Gabrielsen, Egil, Dr.philos	LESE FOR LIVET. Lesekompetansen i den norske voksenbefolkningen sett i lys av visjonen om en enhetsskole
2003/2004	Hansen, Anita Lill, Dr.psychol	The influence of heart rate variability in the regulation of attentional and memory processes
	Dyregrov, Kari, Dr.philos	The loss of child by suicide, SIDS, and accidents: Consequences, needs and provisions of help
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	Torsheim, Torbjørn, Dr.psychol	Student role strain and subjective health complaints: Individual, contextual, and longitudinal perspectives
	Haugland, Bente Storm Mowatt Dr.psychol	Parental alcohol abuse. Family functioning and child adjustment
	Milde, Anne Marita, Dr.psychol	Ulcerative colitis and the role of stress. Animal studies of psychobiological factors in relationship to experimentally induced colitis
	Stornes, Tor, Dr.philos	Socio-moral behaviour in sport. An investigation of perceptions of sportpersonship in handball related to important factors of socio-moral influence
	Mæhle, Magne, Dr.philos	Re-inventing the child in family therapy: An investigation of the relevance and applicability of theory and research in child development for family therapy involving children
	Kobbeltvedt, Therese, Dr.psychol	Risk and feelings: A field approach
2004/2005	Thomsen, Tormod, Dr. psychol	Localization of attention in the brain

Løberg, Else-Marie, Dr.psychol	Functional laterality and attention modulation in schizophrenia: Effects of clinical variables
Kyrkjebø, Jane Mikkelsen, Dr.philos	Learning to improve: Integrating continuous quality improvement learning into nursing education
Laumann, Karin, Dr.psychol	Restorative and Stress-reducing Effects of Natural Environments: Experiential, Behavioural and Cardiovascular Indices
Hølgersen, Helge, PhD	Mellom oss - Essay i relasjonell psykoanalyse
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Hetland, Hilde, Dr.psychol	Leading to the extraordinary? Antecedents and outcomes of transformational leadership