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Easychange

A description of the psychological basis

Pål Kraft
Professor, PhD
Department of Psychology,
University of Oslo

Jonas Linkas
Health Psychologist Changetech

Silje Aurora Fosheim
Health Psychologist Changetech

This document provides a description of the psychological basis for the construction of the educational content, dynamic exercises, diary, email, sms, etc. functions of Easychange.

Each intervent (intervention element) (i) is based on and reflects psychological theory and research; (ii) is constructed according to accepted principles in psychological therapy; (iii) reflects a specific predictor of successful change; (iv) is launched according to a reasoned chronology of the change process, and; (v) is distributed via carefully selected appropriate digital, interactive media.

Easychange has been built on and resembles the “generic” chronology and psychological processes of human change. Stated differently, Easychange reflects a model of the timeline, processes and predictors of individual change represented in terms of an environment that enables designing and developing psychological interventions delivered by means of digital communication tools.

A central premise for making Easychange has been the fact that individual change in different (behavioral) domains shares communalities. For example, different types of change seem to reflect a common chronology. Additionally, successful outcome of different change processes seem to be predicted by a set of common antecedents or predictors[1]. The generic chronology and common predictors of much individual change has been incorporated in Easychange. However, importantly, the specific set of predictors and the underlying processes of change in one specific (behavioral) domain are not totally identical with the predictors and change processes in a different domain. Consequently, every domain of individual change has a certain amount of uniqueness and a set of specific predictors of outcome that are not common or shared with other types of change[2].

The above reasoning supports the notion that intervention programs that are produced to help people change, can contain both a generic component and a domain specific component. Consequently, when applied within a specific domain of

[1] To mention but on be example, successful smoking cessation and weight control share some common predictors; e.g. a certain amount of self-control.
[2] It is obvious that stopping smoking and initiating weight control are different behavioural changes in many ways!

(behavioral) change, Easychange must be supplemented by the construction of domain specific elements. Stated differently, a domain specific application (a “skin”) must always be added (the “backbone” of the intervention) in order to represent a complete domain specific intervention.

The present document describes the psychological know-how on which Easychange is based. Broadly speaking, three “layers” of psychological insights are reflected. The first layer represents a selection of psychological theories and research, which identify and explain basic mechanisms involved in successful individual change. The second layer contains a selection of general psychological intervention techniques, practices and procedures, based on the more general theoretical insights. Finally, the third layer contains a set of specific processes and predictors. These processes and predictors are deducted from the two above described “layers”, and reflect factors that may promote or hinder successful individual change. Importantly, they are utilized for constructing specified and detailed intervention components, which are denoted intervents within the Easychange terminology.

Intervents

In Easychange, (a) psychological theory, (b) therapeutic principles and techniques, (c) specific predictors of successful change, and, (d) the digital, interactive communication tools used to deliver intervention components and contents, come together in what are denoted intervents.

To the end-user, an intervent appears to resemble a communication message. Importantly, however, each intervent is based on and reflect psychological theory and research; is constructed according to accepted principles in psychological cognitive-behavioral therapy; reflects a specific predictor of successful change; is delivered through interactive, digital media; at a carefully selected time-point of the change process, and; is individualised to the needs of the specific client going through the change process. In other words, an intervent is a unit of information that is communicated to the individual end-user on the basis of answers to the following questions: What is the reasoning behind the informational content of the message? How is the message communicated and why? In what channel is the message

communicated, and why? How and why could/should the message/medium create interactivity? What is the specific timing of the message and why? How and why does this message interact with other messages delivered as part of the programme? Easychange is based on a careful analysis of such issues. Hence, messages that are distributed to the end-users do not only carry information. Rather, they reflect theoretical reasoning, clinical expertise, the chronology of change, the characteristics of the digital channel through which the message is distributed, and is individualized to the specific needs of the end-user.

As alluded to above and outlined in more detail below, it is commonly shared knowledge that different types of individual change (to some extent) reflect a common underlying process and a common chronology. Stated differently, the occurrence, frequency and magnitude of different psychological processes and predictors of successful change, tend to reflect a certain “pattern” and “timeline” of the overall change process (e.g. initiation, implementation and maintenance). The psychological theories and principles on which Easychange has been constructed, makes it possible to model a generic logic and chronology of individual change. Again, this chronology outlines what is conceived of as the common structure of much individual change. Accordingly, predictors, processes, and timelines which are specific (or idiosyncratic) within specific change domain must be added.
One important reason why Easychange was constructed to reflect such a generic change process and chronology is that it makes it possible to capitalize on tunneling, which is a central characteristic of the use of computers (e.g. the Web and mobile phones) as change agents. Tunneling implies leading the end-user through a predetermined sequence of actions or events, step by step. Accordingly, appropriate therapies, materialized as intervents, are launched at what is assumed to be the right timing (and situation) of the change process; one of the most potent characteristics of the use of computers in individual change processes.

The purpose of the present document is to outline some of these prevailing theories and principles. In so doing we follow a certain logic. The psychology is organized in three layers. We start by describing the first layer, which contains the theories, which represent the basic theoretical platform of Easychange. Importantly, these theoretical perspectives can help us understand processes of change, predictors of successful

change, as well as identify broad strategies or principles in order to construct effective change interventions. The second, layer, which reflect and is based on the first layer of theories, contain broad areas of therapeutic perspectives and strategies that have been extensively used for the construction of Easychange. Finally, the third layer consists of a selection of more specific predictors of successful change that must be addressed by an effective change intervention, as well as a description of some of the change tactics that Easychange contains. Importantly, these predictors have been utilized for the construction of the *intervents* (see above); the specific messages/change ingredients that are delivered to the client by means of interactive, digital media.

Layer 1: The theoretical foundation of Easychange

At the most basic level the construction of the Easychange is based on a set of psychological theories and perspectives, which are considered particularly relevant for the initiation, and maintenance of individual change. These theories and perspectives are outlined in the following.

1. Goals, intentions, and successful change

Most theories of motivation and self-regulation converge on the idea that *setting a goal* is the key act of willing that promote goal attainment. In psychological terms, people often have the *intention* to change themselves (Fishbein & Ajzen, 1980). Intentions typically take the format of “I intend to stop smoking”, “I intend to lose weight”, “I intend to become happier”, “I intend to adhere to my medication scheme”. Intention comprises a person’s motivation towards a goal in terms of direction and intensity and they are a prerequisite for self-change (Sheeran, 2002). They are derived from beliefs about the feasibility and desirability of actions and end states. However, good intentions do not necessarily guarantee corresponding actions. On the contrary, intentions to change oneself or one’s lifestyle are seldom successful (Sutton, 1994). Hence, there is evidence that gives credence to the proverb that “the road to hell is paved with good intentions”. In fact, strength of intention typically explains only 20-35% of the variance in goal achievement (Sheeran, 2002). Thus,

there is a substantial “gap” between peoples’ goal intentions and their subsequent goal attainments.

Accordingly, setting a goal (having good intentions) is only just a first step towards goal realization. Additionally, successful goal attainment is dependent on solving a number of consecutive tasks. Goal setting is seen as merely the first of these tasks. Necessary additional tasks towards successful goal-pursuit includes for example planning how to achieve the goal, getting started, coping with risk situations and temptations, handling set-backs or relapses, and finally maintain the self-change (Gollwitzer, 1990).

Rothman (2000, 2004) has suggested that the decision criteria that lead people to initiate a change (in behavior) are different from those that cause them to maintain the change. Hence it seems justified to talk (at least) about two phases; a motivational, goal setting phase and a volitional, goal-pursuit-phase (Gollwitzer, 1990). These phases contain and reflect different psychological processes. In the motivational phase an intention to change oneself develops, which means that people “instruct themselves” to change (Triandis, 1980). Intention formation represents the culmination of such a decision making process (Sheeran, Milne, Webb & Gollwitzer, 2005) and is primarily the outcome of an analysis of expectations. First, expected outcomes in terms of future costs and benefits associated with different courses of action. If this judgmental process turns out favorably in the direction of changing oneself, efficacy expectations (self-efficacy) come into play. Efficacy expectations reflect the beliefs in one's **capability** to execute the courses of actions, which lead to the goal. These types of outcome and efficacy expectations broadly capture the essence of the most influential models used to predict people’s intentions - e.g. the theory of planned behavior (Ajzen, 1991), the social cognitive theory (Bandura, 1986, 1995, 1997), and the protection motivation theory (Maddux & Rogers, 1983). Broadly, these expectations stems from a great many internal and external sources of information which represent more distal determinants of intention formation, for example personal experiences; friends and family; campaigns and news media; advice from health-personnel, and more.

However, going from being motivated to actually change oneself represents that one enters a volitional phase in which the intended change must be planned, initiated and maintained. This is not straightforward. According to Sheeran et al. (2005), the intention-behavior discrepancy that is so often observed can be ascribed to several processes. First, intention viability, which involves that particular abilities, resources or opportunities, are necessary for intentions to be carried out in actions. Viability can for example be represented by being confident that one is able to change (having high self-efficacy). According to the leading behavior theories (e.g. theory of planned behavior) the fact that people are quite confident that they are able to change, probably fuels both motivation and initial behavior change. Another prerequisite if an intention to change shall be carried through is intention activation. This is related to the process of environmental activation of alternative goals that may change the salience, direction or intensity of the focal intention to make a change attempt. This may for example happen when the situation brings up more enjoyable or pressing alternatives (Sheeran et al., 2005). For example, a party or a holiday is coming up, the situation at work is particularly stressful, or one's personal life is in misery for one reason or another. Thus, you do not carry through the intention to change yourself. You are still motivated to change, but the timing just does not seem right.

The third and last prerequisite, if an intention to try to change is to be followed by an actual change attempt, is the formation of an action plan. This involves the process of linking goals (try to change) to environmental cues by specifying when, where and how the behavior is going to be performed/initiated (Gollwitzer, 1999). It has been shown in a number of areas (including several health behaviors) that people who make specific action plans are more likely to act in the intended way. This probably implies that more effective change interventions should comprise a component which stimulate the person to make a change plan (or the program itself represents such a plan[3]) which specifies the preparations needed to be done before the change actually takes place.

However, initiating change is only a first step. In most cases, successful changing involves the long-term maintenance of change. The question of which factors that

[3] Which is the case for Easychange, which leads the person through a tunneled chronology of change.

predict change maintenance is neither theoretically nor empirically (or methodologically for that matter), a trivial question. Although motivation (intention formation) and behavioral initiation (making a change attempt) is necessary for people to change, the theories and models which describe those processes are not equally helpful in providing an understanding of why people fail to maintain a change. While making a change attempt requires motivation – staying on track requires self-regulation, i.e. operations by the self to alter its own habitual or unwanted responses to achieve a conscious or non-conscious goal (Vohs & Schmeichel, 2003).

Easychange has been constructed in order to help people to both initiate and maintain change, i.e. to help people get out of the blocks and stay on the track of changing. That is to support self-regulatory tasks.

2. Self-determination theory

One important source of input for Easychange is self-determination theory (SDT). SDT is a theory of personality development and self-motivated behavior change. Fundamental to the theory is the principle that people have an innate organizational tendency toward growth, integration of the self, and the resolution of psychological inconsistency (Ryan, 1995; Ryan & Deci, 2000). Of particular interest in the theory is the question of how people internalize and integrate extrinsic motivations and come to self-regulate their behaviors in order to engage autonomously in actions in their daily life (Deci & Ryan, 1985; Ryan & Deci, 2000).

SDT proposes that all behaviors can be understood as lying along a continuum ranging from heteronomy, or external regulation, to autonomy, or true self-regulation. SDT hypotheses a variety of consequences associated with more controlled versus autonomous behavioral regulation, including effort, persistence, the quality of performance, and the quality of subjective experiences. Autonomous regulation of behavior is held to be both more stable and enduring, and to have more positive effects on human well-being than controlled regulation. SDT also specifies a number of factors that foster or undermine more autonomous styles of behavior regulation.

At the heteronomous and more controlled end of this continuum is behavior that is motivated by external regulations, such as the rewards and punishments that others

might control. Such external regulation may temporarily control behavior, but because the motivation is dependent on external controls, the person will be compliant only when the controls are in operation. Additionally, people who are externally regulated are likely to show minimal effort and poor performance quality, as they are not invested or caring about the behavior change per se.

Somewhat more autonomous is introjected regulation, when a person is motivated not by external controls but by internalized, self-esteem related contingencies. A person who is interojected concerning a behavior imposes pressure on themselves to act, feeling self-disparagement and shame when they fail at the behavior, and pride and self-approval when they succeed. Introjection reflects a partial internalization of the behavior's value, but it remains an ambivalent and unstable form of motivation. Such partially internalized regulation is considered more likely to lead to maintenance of a behavior than externally regulated actions (Deci & Ryan, 2000; Koestner, Losier, Vallerand & Carducci, 1996). However, introjected regulation is accompanied by a negative emotional tone, tension, and an inner conflict between the self-imposed demands to engage in the behavior and the failure to truly value it (Ryan & Connell, 1989; Ryan, Rigby & King, 1993).

Identification is a much more self-determined form of regulation. It involves a conscious acceptance of the behavior as being important in order to achieve personally valued outcomes. The valued outcomes provide a strong incentive that can override difficulties in maintaining the behavior. Hence, identified regulation is more likely to be more relevant than intrinsic motivation to the maintenance of behaviors that are not inherently interesting or enjoyable. Studies indicate that identification is a stable and persistent form of motivation, and when acting in accord with identifications individuals report effort, commitment, and positive experiences (e.g. Ryan & Connell, 1989).

The most autonomous form of external regulation is integrated regulation. Here the person not only identifies with the regulation but also has coordinated that identification with their other core values and beliefs. Integrated regulation is thus stable and persistent, being a fully self-endorsed basis for action/change. Finally, SDT argues that some behaviors are intrinsically motivated and these are behaviors

that are interesting and exciting in their own right. However, oftentimes this is unfortunately not the case for most change processes.

SDT specifies the conditions that foster or maintain more autonomous forms of motivations, and those that undermine autonomy and self-regulation. SDT posits the existence of three fundamental psychological needs as the basis for self-motivation and personality integration (Ryan & Deci, 2000). The first of these is the need for competence. This concerns the psychological need to experience confidence in one's abilities and the capacity to affect outcomes. The need to feel autonomous in one's actions rather than feeling controlled or compelled to act is the second basic need. The third need is the need to feel related. This involves the need to experience connectedness with others and to have satisfying and supportive social relationships.

According to SDT, the process of integrating new regulations over behavior can be facilitated by the social environment, a counselor or a change program (such as Easychange). To the extent that the change program provides for the nurturance of perceptions of competence, autonomy, and relatedness, the person will move toward integration and a unified sense of self, and develop the personal resources for engaging in adaptive and autonomous self-regulation of behavior (Deci & Ryan, 1991).

SDT research has examined three dimensions of the social environment that can promote satisfaction of the psychological needs for competence, autonomy, and relatedness: structure, autonomy support, and involvement (Deci & Ryan, 1991; Ryan, Plant & O'Malley, 1995). With regard to the structural dimension, competence is facilitated when individuals are helped to develop clear and realistic expectations about what the behavior change could do for them, they are helped to formulate realistically achievable goals, they are encouraged to believe that they are capable of engaging in the appropriate behaviors, and positive feedback regarding progress is provided[4]. According to SDT, however, simply feeling competent to engage in a behavior is not enough to provide optimal motivation (Deci & Ryan, 2000; Markland, 1999; Ryan, 1995). One can feel competent about performing a behavior while still

[4] Easychange is constructed on all these principles.

not feeling inclined to do so. An increase in perceived competence will only lead to optimal motivation to act when it takes place within a context of some degree of self-determination (Deci & Ryan, 1985). Thus, a motivationally supportive environment (which may be represented by a change agent or program such as Easychange) will provide support for autonomy as well as for competence.

Autonomy support is concerned with helping the client recognize that he/she can exercise choice regarding his/her behavior. The specific behaviors that are associated with autonomy support are: (a) developing a rationale for engaging in the behavior, (b) minimizing external controls such as contingent rewards and punishments, (c) providing opportunities for participation and choice, and (d) acknowledging negative feelings associated with engaging in difficult tasks (Deci & Ryan, 1985; Reeve, 1998, 2002). In autonomy, supporting contexts pressure to engage in specific behaviors is minimized, and individuals are encouraged to initiate actions themselves and base their actions on their own reasons and values. Thus, autonomy for behavior is facilitated when the actor is helped to be clear about their own reasons for changing, and does not feel pressured or manipulated toward certain outcomes. In fact the more the person “owns” the reasons for changing, the more autonomous and therefore more likely to succeed is the behavior change[5].

Finally, the involvement dimension of the supportive environment is primarily concerned with the quality of the relationship between the client and the helper/change agent/change program (Reeve, 2002). Involvement describes the extent to which the client perceive that the change agent is genuinely invested in them and their well-being, understand the difficulties they are facing, and can be trusted to dedicate psychological and emotional resources that the individuals can draw on for support (Connell & Wellborn, 1991; Deci & Ryan, 1991; Grolnick & Ryan, 1987)[6].

[5] Much emphasis is put on this in Easychange.
[6] Easychange includes the use of several communication channels (e.g. Web, SMS,) in order to increase involvement in the change attempt. Also, much effort is invested in terms of demonstrating empathy with the client (more on this later).

3. Self-efficacy theory

Self-efficacy is a core construct in social cognitive theory (Bandura, 1986) and represents an “I can do it” 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, invest more effort, and are more persistent when facing difficulties (Schwartzer & Fuchs, 1996). In contrast, those who doubt their capacities 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. Hence, optimal functioning requires skills as well as efficacy beliefs 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). In fact, 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 behaviors include health related practices such as diet and exercise, as well as the establishment of a social network and social support (Aspinwall & Taylor, 1997).

Self-efficacy (SE) can be acquired or influenced by four main sources: personal experience, verbal persuasion, vicarious learning, and physiological feedback (Bandura, 1995)[7]. The strongest influence on SE beliefs is personal experience of success at a task[8]. SE can also be influenced by verbal persuasion, meaning that people can convince you that “you can do it”[9]. Vicarious learning implies that seeing

[7] In Easychange self-efficacy is primarily being influenced by the first two processes.
[8] Which is why Easychange incorporates a high number of experience tasks.
[9] Easychange contains much of this type of information.

others perform a specific behavior successfully strengthens SE beliefs. The influence is stronger if the other person is viewed as similar. Finally, people's judgment of their SE may be influenced by their physiological condition. Therefore, if people are anxious, tired or depressed, they may underestimate their SE (Bandura, 1997)[10].

It is, however, important to bear in mind that none of these sources automatically affect SE 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 SE 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 oneself 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 SE beliefs or not depend on how the person attributes the cause of a success or failure. Only when people attribute the cause to themselves does success/failure influence SE 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 SE 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 SE beliefs. This tendency to interpret information in a way that is consistent with pre-existing beliefs and expectations does not imply that SE beliefs cannot be influenced; rather it means that the same experience may have different effects on people with high versus low SE. Consequently, people with low SE beliefs may need stronger influences to increase their SE than people with higher SE[11].

[10] Which is one reason (amongst a number) why Easychange contains a positive psychology/emotion regulation intervention component.
[11] Much emphasis is invested in Easychange to have people make "appropriate" attributions of success and failure, i.e. attributions which fuel and do not deplete their motivation for future effort. Also, much emphasis is put on the attribution of slips or relapses.

SE relates 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 behavior and by influencing how people confront stress in their lives. In this respect, SE is related to the tendency to view stressful situations as more challenging than threatening and to use more active than passive coping strategies (Jerusalem & Schwarzer, 1992). Further, a high number of studies have found SE to play a central role in predicting (health-related) behavior (Conner & Norman, 1996). Thus, SE has been incorporated in most health behavior theories (Bandura, 1997; Conner & Norman, 1996). SE is considered an important determinant of behavioral change because of its influence of the initial decision to engage in a behavior (intention), the efforts expended, and the persistence experienced when facing difficulties (Bandura, 1995, 1997)[12].

4. Self-regulation: from change initiation to change maintenance.

As we have indicate above, the question of which factors that predict change maintenance is not a trivial one (see for example Piasecki, Fiore, McCarthy & Baker, 2002; Rothman, Baldwin & Hertel, 2004). Although motivation (intention formation) and behavioral initiation (making a change attempt) is necessary for people to initiate change, the theories and models which describe those processes are not equally helpful in providing an understanding of why people fail to maintain a behavior change. While making a change attempt requires motivation – change maintenance requires self-regulation, defined as “operations performed by the self to alter its own habitual or unwanted responses to achieve a conscious or non-conscious goal” (Vohs & Schmeichel, 2003). Hence while expectations of future outcomes and the creation of implementation intentions are important for the motivation and initial behavior changes, continued response and maintenance of change is probably more influenced by the experiences people have with their new behavior.

This experience includes their thoughts, feelings and the behavioral consequences, which follows the new behavior. Handling these consequences involves efforts to avoid spontaneous learned, habitual, or innate responses to situational or

[12] Importantly, however, different types of self-efficacy beliefs are important throughout the chronology of a change attempt. Easychange makes the distinction between these types of self-efficacy beliefs.

physiological cues, and to act in an intentional way. In other words, maintaining the new behavior involves self-regulation. The inability to maintain the new behavior most often represents a self-regulation failure, i.e. an inability to exert self-control and thus acting out an impulse that runs counter to the person's values or long-terms goals (Baumeister & Heatherton, 1996). In other words, self-control allows us to override undesirable thoughts, feelings, and responses, and to avoid temptation (Webb & Sheeran, 2003).

Generally, successful self-regulation is a multifaceted process. Hence, many factors can contribute to a failure in self-regulation (for overview see Baumeister & Heatherton, 1996). One major account of self-regulation failure is the depletion of self-regulatory resources. According to this model, a person at any time has limited amounts of generalized self-regulatory resources (Baumeister & Heatherton, 1996). Hence, people can be temporarily depleted or fatigued of self-regulatory resources, for example, when they try to resist their temptations or control their emotions (Vohs & Heatherton, 2000).

The idea of the resource-depletion model of self-regulation is that an initial act, which requires self-regulatory resources, is followed by a period when the self-regulatory resources remain depleted. If one, in this period, is exposed to a situation that requires effective self-regulation, then a failure in self-regulation is likely to happen (for overview see Vohs & Schmeichel, 2003). For example, if you in a middle of a change attempt experience stress or negative affect, you may need to use self-regulatory resources to cope with the experience of stress or negative affect. If you simultaneously or short after, are exposed to a temptation (for example to have a cigarette if you have stopped smoking or eat a chocolate if you are on a diet), then you are probably at this very moment at risk to (re)lapse, because your self-regulatory capacities are temporarily depleted. Alternatively, a simultaneous exposure to both negative affect or stress and a temptation, may represent a too heavy burden for the self-regulatory resources.

In order to understand the process of relapse[13] there seems to be a need for identifying the chronology of relapse risk forces, i.e. how the strength of the various relapse forces wax and vane throughout a change attempt. On the basis of much existing research (described in more detail below) it is likely that relapse proneness is both multi-faceted and follows a certain chronology. Hence, behavioral change interventions should be designed accordingly[14]. More specifically, we know from certain areas that some relapse forces and risk factors may manifest themselves in slow oscillations in "relapse proneness" over time (see Piasecki et al., 2002). Still, it appears important to take into consideration that profiles of relapse proneness often vary considerably across time, situations and persons (see for example Piasecki, Fiore & Baker, 1998). Actually, focusing the dynamics and consequences of “sudden spikes” in symptomatology and relapse proneness may appear to contribute more to our understanding of relapse than ratings from a number of respondents which are averaged (or even ratings from a single individual averaged over time) (see for example Piasecki, Fiore & Baker, 1998). Although most of the above research was related to smoking, it seems reasonable to apply a parallel model for many other behavior change domains. The obvious consequence for interventions is that they should be able to prevent both slow oscillations as well as sudden spikes in relapse proneness[15].

Accordingly, an important characteristic of an effective intervention program would be the ability to prevent ego depletion and/or to offset ego depletion when it occurs. Webb & Sheeran (2003) have shown that the formation of implementation intentions may help serve both needs. Implementation intentions (Gollwitzer, 1993, 1996, 1999) are sub-ordinate to goal intentions. Thus, while a goal intention may be that “I will stop gambling” an implementation intention is a staement of the form: “As soon as situation *y* occurs, I will initiate goal-directed behavior *x*”. By specifying the coping response (goal directed behavior), before the situation arises, one passes control of behavior to specified cues (feeling an urge to gamble), which probably implies that

[13] A relapse can occur in any form of change domain; it just means that you fall back into your old habit, way of thinking, etc.; that the change attempt fail.
[14] Which is of course the case for Easychange.
[15] Different digital channels can be applied for this purpose. For example, the web may provide information that may help prevent slow oscillations, while the mobile phone may provide ”on demand” therapy and support whenever and wherever it is needed. Easychange incorporates both types of systems.

the need for cognitive control is circumvented, a process called “strategic automatization” (Gollwitzer & Schaal, 1998, p.124; Webb & Sheeran, 2003).

Usually, implementation intentions are more effective if they relate specifically to when, where, and how one will act (Gollwitzer, 1993, 1996, 1999). However, an impulse to relapse may occur in many different physical and psychological situations; at home, at work, when attending a party, when being frustrated, grumpy, or stressed, etc. Hence, it appears to be difficult for the client to make specific implementation intentions regarding how to act in all combinations of locations, situations and moods. Thus, it seems more appropriate that the client has formed one implementation intention to cover all situations and moods, such as “use the instant help function”, if such one is incorporated in the change program. However, the assistance or therapy provided by the instant-help-function should be specifically related to the circumstances (psychological situation) that the person experiences (more about this later).

Most psychologically oriented change interventions appear to be based on a psycho-educational approach. This implies that they try to educate people who change about what to expect and how to handle difficult times. For example, you “learn” from for example self-help books how you shall intervene on your thoughts, feelings and behavior, if and when a situation arises. However, the peaks in relapse proneness are difficult to predict, they may occur suddenly and in many cases they disappear after a relatively short period of time. Hence coping with them cannot wait until you have gotten home and have consulted your self-help material (or until next week when you have your next group counselling). The peak in symptoms is a “close call situation” that must be dealt with as soon as possible; i.e. help and support should be available whenever and wherever you need it. Thus, more effective behavior change interventions are likely to offer support or therapy, which is available just before and during the peak in relapse proneness, is experienced by the person undergoing change[16].

[16] Which is exactly what Easychange does in terms of instant help; More on this later.

The next question that arises is then of course what kind of treatment that should be available at the “close call” situation. Generally, it seems reasonable that the content of the treatment should reflect what the client experience psychologically during a peak in relapse proneness. In this respect it seems relevant to point to the fact that a considerable amount of research has testified to the important role that negative affect seem to play in relapses (for research on smoking and dieting see for example Kenford, Wetter, Jorenby, Fiore, Smith & Baker, 2002; Shiffman & Waters, 2004). It seems reasonable to expect this to be the case in other behavioral a number of different behavioral domains, hence negative affect seems to play an important role for relapse.

As a corollary, it seems pertinent to consider negative affect to be both a proximal predictor of relapse and a mediator and/or index of the processes that yield relapse vulnerability (see for example Kenford , Wetter, Jorenby, Fiore, Smith & Baker, 2002; Piasecki et al., 2002). Thus, in addition to its own unique contribution, negative affect seem to mediate and moderate the impact of a number of both pharmacological and non-pharmacological events and processes upon relapse proneness.

A number of explanations which may possibly account for the causal mechanisms which may underlie the relationship between negative affect and relapse proneness have been offered (for overview see Shiffman & Waters, 2004). Although further research into these mechanisms is welcomed, we know enough to suggest that effective behavioral change interventions probably should include some elements that can effectively help individuals tackle the experience of negative affect – whenever and wherever negative affect is experienced simultaneously with an urge to relapse[17].

Additionally, when the client experiences temptations, i.e. close call situations in which the client is brought to the brink of relapse, the occurrence of relapse seem to be influenced by the clients coping responses. In this respect, the use of both cognitive and behavioral coping strategies seem to effectively prevent relapse in such situations (for overview see Shiffman et al., 1996), which is why behavior change

[17] Meaning that the intervention programme (and in particular the) instant help must contain treatment elements that may relieve the client from the experience of negative affect.

programs typically aim to prepare people by improving their coping resources (see for example Lichtenstein & Glasgow, 1992). It seems reasonable to expect that although interventions, which improve the clients coping resources in general (pre- and post-change self-efficacy), may be justified, intervention elements that support adequate coping in close call situations would seem particularly promising[18].

Summing up this part, Easychange has been constructed on the basis of our most recent knowledge of the processes leading up to a relapse. First, by the fact that the chronology of the change attempt has been modelled, and the fact that the specific psychological processes, obstacles, etc. are addressed according to a predetermined timeline. Second, slow oscillations in relapse proneness are dealt with in terms of the regular program content delivered as part of the psychoeducational component of the program. Third, the user is offered instant help at "close call situations" by having the opportunity to access instant help at any time and from any place. Instant help offers support and therapy for the acute problem (classified as for example negative affect, stress or lack of motivation) that the client experiences (more on this system later).

5. Positive psychology

A change process is often motivated by long-term goals that we have. People want to control their blood pressure, lose weight, drink less alcohol, stop smoking, get better grades, have a better marriage, etc. Alternatively, they have been advised by their physician to change their lifestyle, reduce their blood pressure or cholesterol level, etc. In many cases, the achievement of such long-term goals involves that we must abandon choices and behaviors that normally give us pleasure and positive affect on a short-term basis (having a drink, having a cigarette, eating a chocolate, etc.). Hence, in many situations effective change involves the behaviors that lead to the attainment of long-term goals (reduce your cholesterol level) override behaviors that relates to short-term goals (enjoying a fatty meal).

Often, the attainment of long-term goals are based on cognitions about "what is good for me", while the attainment of short-term goals are more often based on affections

[18] Easychange thus contain instant treatments (provided by the mobile phone) for negative affect, stress and lack of motivation which may be the main psychological problems that the client struggles with in close call situations.

about “what is good”. Accordingly, to be able to change successfully in the long run, we must regulate ourselves in the service of our long-term goals. As described above, this often involves effort, self-monitoring and vigilance. In particular, in order to resist temptations, impulses or particularly demanding situations. Thus, in the middle of a change attempt, we may feel “drained of change energy”, or ego depleted. In such a situation, the “change muscle” may have become tired or exhausted, and the change attempt is at risk for a breakdown.

Importantly, ego depletion, and a breakdown in self-regulation, often occurs in combination with negative emotions. Hence, negative emotions may cause, contribute to or be an effect of self-regulation breakdown. Often, negative emotions are also caused by the fact that behaviors that we have valued cannot longer be performed (having a drink, having a cigarette, having a cake, etc.).

Consequently, the client would benefit from not only having a behavior change intervention, and support to self-regulate successfully, but also interventions that may help him/her to feel better, be more happy, and value life positively even after the behavior change has been initiated[19]. The theoretical basis for such interventions can be found in the field of positive psychology. Positive psychology is an umbrella term for the study of positive emotions, positive character traits, and enabling institutions (Snyder & Lopez, 2002). Research findings from positive psychology are intended to supplement, not to replace, what is known about human suffering, weakness, and disorder (some of which is described above). The intent is to have a more complete and balanced scientific understanding of the human experience – the peaks, the valleys, and everything in between. A complete science and practice of psychology thus includes an understanding of suffering and happiness, as well as their interaction, and validated interventions should aim at both relief suffering and problems – and increase happiness and positive affect.

The term “affect” refers to the feeling tone a person is experiencing at any particular point in time. Such feeling tones vary primarily in terms of hedonic valence, but they can also differ in terms of felt energy or arousal. If the feeling tone is strong, has a

[19] Which is why Easychange contains such an intervention component.

relatively clear cause, and is the focus of conscious awareness, then we use the term "emotion" or "affect" to refer to those feelings. However, if the feeling tone is mild, does not have a clear cause or referent, and is in the background of awareness, then we use the term "mood".

There is good reason to expect that people, who are striving to change important aspects of their lives, will benefit from effective affect regulation. It is likely that interventions that install positive affect will both increase the likelihood that the change attempt itself will be successful and give the client a better life during the change process. In Easychange, we capitalize on what we know about "affect regulation" and we use the term to subsume the management of subjective feeling states in general. Thus, we use "affect regulation" where others have used terms like "emotion regulation" or "mood regulation". By using the term affect regulation we are concerned with effortful or controlled affect regulation rather than automatic processes[20].

Why does Easychange contain an affect regulation component? The reason is that affective states influence subsequent behavior, experience, and cognition (e.g. Bless & Forgas, 2000). Thus, one function of affect regulation is to limit the residual impact of lingering emotions and moods on subsequent behavior and experience. Certainly, feelings provide important information to a person and serve to direct subsequent thought and behavior in mostly adaptive ways. Hence, the goal of affect regulation is not to prevent or short-term circuit all affect. Rather, this goal of effective affect regulation is akin to hanging up the phone after receiving a message. For example, if a woman is angry with her spouse because he did not listen to her side in an argument, then that experience of anger should tell her that this issue is important to her. Effective anger regulation would allow her to have the information that her angry feelings convey, yet also use these feelings to energize an effective response. In this way, the residual maladaptive interpersonal or personal effects (like having a chocolate if you are on a diet) are limited.

[20] More details about how Easychange use affect regulation is provided below.

It follows that within this perspective, affect regulation refers primarily to the modulation of feeling states, mostly in terms of the valence of those states, although people seek to regulate energy level as well (Thayer, 2001). Researchers in the stress and coping tradition have primarily emphasized the down-regulation of negative affect (e.g. Bushman, 2002; Tamres, Janici & Helgeson, 2002). Other researchers, however, have focused the up-regulation of positive affect (Davidson, 2000; Fredrickson, 2000; Lucas, Diener & Larsen, 2003)[21].

Affect regulation influences the residual or downstream consequences of feeling states, help people adapt to daily life, and influences health in a positive way. Additionally, people regulate their affect level in order to achieve another superordinate goal: to maintain a global sense of subjective well-being (SWB). SWB has two affective components at its core, both of which are considered as aggregates or averages over relatively long time periods (Diener & Seligman, 2002). These two components are average levels of positive affect (PA) and negative affect (NA). Consequently, people may influence their SWB by regulating the two major affective states, PA and NA. Interventions, like Easychange, thus have to aim at helping people to minimize NA and/or maximize PA. This can be done in two ways. The intensity of the affective state may be influenced (downward for NA and upward for PA), and/or the duration of the affective state may be influenced (increased for PA and decreased for NA).

Easychange includes intervention elements that are based on a number of affect regulation strategies. These specific strategies reflect one of four general classes of affect regulatory strategies: those strategies that are either behavioral or cognitive, and are focused on changing the situation or the emotion (Larsen (2000). Easychange aims to influence both NA and PA. However, negative life events have a stronger impact on subjective feelings than do positive events (Baumeister, Bratslavsky, Finkenauer & Vohs, 2001) and NA is two to three times stronger than PA (Larsen, 2002). Additionally, change reactions and consequences (e.g. ego depletion and relapse) are often paired with the experience of NA. Still, the increase

[21] Since negative affect seem to play a crucial role for self-regulation failure Easychange focus more on the down-regulation of negative affect than on the up-regulation of positive affect.

in PA is also an important goal of Easychange, since people in their daily lives often try to induce or maintain PA (Larsen, 2002)[22].

6. The chronology of change

As described above, recent years have seen an enormous interest in the chronology of change processes. Much of the theoretical reasoning and empirical research in this area has materialized in the various stage models that have been launched. Easychange has for the main part been constructed on the basis of two of these stage models: the precaution adoption process model (PAPM) (Weinstein & Sandman, 1992, 2002a, 2002b) and (variations of) the Rubicon model or model of action phases (Heckhausen, 1991; Gollwitzer, 1996) which is a four-stage model that forms the theoretical background to the work on implementation intentions as well as Rothman's (Rothman, 2000) distinction between behavior initiation versus maintenance.

A key assumption of all stage theories is that the relative importance of different factors (processes, predictors, obstacles, etc.) vary across different stages. Hence, for example, a specific set of factors may influence the transition from intention to behavior initiation, while a different set of factors may influence the transition from behavioral initiation to maintenance. This allows for the creation of intervention components specifically aimed at these processes/factors. Equally important, it allows for the modelling of a "tunnel of the chronology of change", i.e. a description of the step-by-step process that the client must follow on the path to successful change. Moreover, it (the chronological model and the tunnel) informs us about the "which, why and how" regarding the launching of different "treatment" intervention components throughout the timeline of the change attempt[23].

As alluded to above, Rothman (2000, 2004) has suggested that the decision criteria that lead people to initiate a change in behavior are different from those that cause them to maintain the new behavior. Hence it seems justified to talk about two phases;

[22] More details on the specific affect regulation strategies applied in Easychange are given later in this document.
[23] This is an important characteristic of Easychange.

a motivational, goal setting phase and a volitional, goal-pursuit-phase (Heckhausen, 1991; Schwartzer, 1993). These phases reflect different psychological processes. In the motivational phase an intention to change develops, which means that people “instruct themselves” to change (Triandis, 1980). Intention formation represents the culmination of a decision making process (Sheeran, Milne, Webb & Gollwitzer, 2005) and is primarily the outcome of an analysis of expectations. First, expected outcomes in terms of future costs and benefits associated with different courses of action. For many behaviors, some level of personal risk awareness is often involved at this stage; for example for hypertension the concerns about having a brain stroke may be present. If this judgmental process turns out favorably in the direction of changing (taking diet, become more physically active, take medication, etc.), efficacy expectations (self-efficacy) come into play. As described above, efficacy expectations reflect the beliefs in one's capability to execute the courses of actions that lead to the goal.

The Precaution adoption process model (PAPM) (Weinstein & Sandman, 1992, 2002a, 2002b) specifies seven discrete stages in the process of precaution adoption. In the first stage, people are unaware of the problem or situation (e.g. health issue) they actually experience. People in stage two are aware of the issue, but they have never thought about adopting any kind of precaution (or initiate change); i.e. they are not personally engaged in the issue. People, who reach stage three, are aware and have given it some consideration, but are still undecided about whether or not to initiate change. If they decide against changing, they move into stage four, i.e. a decision not to act. If they decide in favor of changing, they move into stage five (decided to initiate change). Having reached stage five, people who act on their decision move into stage six, which is acting. Finally, for many behaviors, a seventh stage representing the maintenance of change is appropriate.

As alluded to above, different factors seem to be of different importance at different stages in the change process. For example, a change in motivation (i.e. the weighting of pros and cons of change) is important in terms of moving people from stage one to stage two in the PAPM. These types of messages typically contain information about (important and likely) consequences of changing versus not changing (e.g. about the hazard and the precaution). In order to move people from stage two to stage three,

however, communications from significant others (physician, family, friends, etc.) or personal experience with the hazard (or consequences of the hazard) seem to be more important. To move people from stage three to stages four and/or five, personal beliefs about hazard likelihood and severity, personal susceptibility, precaution effectiveness and difficulty (self-efficacy), behaviors and recommendations from others, as well as fear and worry, are considered to be important factors[24]. In terms of moving people from intention to action, however, that is from stage five to stage six, considerations of time, effort, and resources needed to act, seem to be more important. Furthermore, for this stage transition to occur, people need detailed "how-to" information. They would also benefit from reminders and other cues to action, as well as detailed assistance in carrying out action[25]. Finally, moving people from action to maintenance implies the prevention of relapse (see above). In this phase, both information (e.g. to prevent slow oscillations in relapse proneness and on how to attribute lapses/slips), as well as reminders (e.g. about coping strategies at "close call" situations) will be useful to the client.

Layer 2: Basic therapeutic principles in Easychange

The major components of the theoretical platform of Easychange were briefly described above. We now turn to the question of how these theoretical insights (supported by much empirical research) has been utilized for the construction of practical intervention components in Easychange, that is in terms of therapeutic ingredients, modes of communication, tasks, messages, information content, and the like.

We conceive that the five major theoretical perspectives described to be the basic background of Easychange, have their counterparts in therapeutic techniques and practical applications that are widely used in modern psychology. More specifically, we for example consider (a) self-determination and self-efficacy theory to be the theoretical basis for motivational interviewing; (b) self-regulation and self-efficacy theory to be the theoretical basis for cognitive behavioral therapy, and; (c) positive

[24] Channels that convey information (for example web sites) are particularly useful for these types of stage transitions.
[25] To support these types of stage transitions information channels like the web, as well as tools like SMS(can help you where and when you need it) are expected to be particularly useful.

psychology to be the theoretical backbone for practical interventions and applications in the area of affect regulation. Additionally, our conception that many individual change processes occur in stages, seem to have inspired most, if not all, of these areas of practical applications. We now turn to a brief description of some of the most important therapeutic ingredients and practical applications incorporated in Easychange.

1. Motivational interviewing

Motivational interviewing (Miller, 1983) has become widely adopted as a counseling style for facilitating behavior change. This clinical practice is based on the principles of experimental social psychology, drawing on the concepts of self-determination, causal attributions, cognitive dissonance, and self-efficacy (Miller, 1983). Motivational interviewing has also been closely aligned with the transtheoretical model of behavior change and the concept of readiness for change.

Motivational interviewing (MI) is defined as a client-centered, directive, method for enhancing intrinsic motivation to change by exploring and resolving ambivalence (Miller & Rolnick, 2002). Accordingly, the recognition of client ambivalence plays a central role in MI. It is assumed that most clients seeking counseling or support for change will hold conflicting motivations. Often this ambivalence will be upheld throughout the change process. On the one hand, the person may have good reasons to change their current behaviors, but on the other hand, he/she is aware that there are benefits and costs associated with both changing and staying the same. This decisional conflict can result in the client being stuck in a state in which they are unable to change (or maintain a change) despite there being incentives to do so, or to alternate between engaging in a new behavior pattern and relapsing to old behaviors.

It is claimed that attempting to directly persuade a client to change or upheld change will be ineffective because it entails taking one side of the conflict that the client is already experiencing. The result is that the client may adopt the opposite stance, arguing against the need or appropriateness for change, thereby resulting in increased resistance and a reduction in the likelihood of starting or upholding change (Miller & Rolnick, 1991; Rollnick & Miller, 1995). Instead, MI allows the client to

overtly express their ambivalence in order to guide them to a satisfactory resolution of their own conflicting motivations with the aim of triggering appropriate behavioral changes (Rollnick & Miller, 1995).

A key assumption of MI is that it is not the counselor's function to directly persuade or coerce the client to initiate or uphold change. Rather it is the client's responsibility to decide for themselves whether to change and how best to go about it. The counselor's role in the process is to help the client locate and clarify their motivation for change, providing information and support, and offering alternative perspectives of the problem behavior and potential ways of changing (Miller, 1983). It follows that MI is a client-centered style of counseling. Still, the aim of MI is to guide the client toward a resolution of ambivalence and inconsistencies in their behaviors in order to build motivation for change, usually in a particular direction.

Generally, there are four principles of MI that underpin its specific techniques and strategies: the expression of empathy, the development of discrepancy, rolling with resistance, and support for self-efficacy (Miller & Rollnick, 2002).

Although by no means exclusive to MI, an emphasis on the importance of the expression of empathy by the counselor is a fundamental and defining feature of MI (Miller & Rollnick, 1991, 2002)[26]. Extensive research shows that therapist empathy is predictive of treatment success. Hence, MI is centered on the position that behavior change is only possible when the client feels personally accepted and valued. Therefore, counselor empathy is seen as crucial in providing the conditions necessary for successful exploration and maintenance of change.

The directiveness of MI is evident in its second principle, the development of discrepancy. This involves exploring the pros and cons of the client's current behaviors and of change to current behaviors (or of upholding a behavior change) within a supportive and accepting atmosphere, in order to generate or intensify an awareness of the discrepancy between the client's current or previous behaviors and his/her broader goals and values. It is assumed that developing this discrepancy

[26] Empathy is often considered to be particularly important to establish an alliance between the client and the counselor, i.e. early in the process of change.

elicits movement toward consistency between the client's behavior and his/her core values (Miller, 1994)[27]. Hence, discrepancy development is seen as an aspect of a more general strategy of aiding the client in clarifying conflicts concerning change and his/her potential choices.

While MI is directive, in the sense that it aims to help the client become aware of the discrepancies inherent in their current behaviors and to lead them toward considering and maintaining change, the avoidance of arguing for change is seen as critical in successful counseling or guiding (Miller & Rollnick, 1991). This practice is denoted as rolling with resistance (Miller & Rollnick, 1991, 2002). It is based on the assumption that direct arguments for change will provoke reactance in the client and a tendency to exhibit greater resistance, which will reduce the likelihood of change. Instead, ambivalence and resistance are accepted as normal and respected by the change agent or counselor. Rather than imposing goals and strategies, the counselor encourages the client to consider alternative perspectives on the problems. The intention is to transfer the responsibility for arguing for change to the client by eliciting what is termed "change talk". These are overt declarations from the client that demonstrate recognition of the need for change, concern for their current situation, intention to (maintain) change, or believe that change is possible (self-efficacy).

Hence, the final general principle of MI, is the need to support self-efficacy for change. It is recognized that even if the client is motivated to modify his/her behavior, change will not occur unless the client believes that he/she has the resources and capabilities which are necessary to overcome barriers, obstacles and set-backs, and successfully implement and maintain new ways of thinking or behaving.

2. Cognitive behavioral therapy

Cognitive therapy (we use the terms cognitive therapy and cognitive behavioral therapy interchangeably, since it is usual for "cognitive therapy" to incorporate behavioral techniques as well) arose from Beck's (1976) cognitive behavioral hypothesis of emotion. This hypothesis states that emotions arise not because of

[27] For example from "what is good" to "what is good for me".

events but from how they are appraised or interpreted, which is influenced by underlying cognitive structures that cause faulty or biased interpretations of events.

Cognitive therapy was first described in terms of the cognitive theory of depression (Beck, Rush, Shaw & Emery, 1979), which sees early life experiences as influencing the development of core beliefs ("schema" or "schemata"). Core beliefs are held to be at a level of unconsciousness such that an individual is not fully aware of their significance and influence on current cognitions, emotions and behaviors, until their attention is drawn to this by means of therapy. Considered stable personality traits, core beliefs are global, rigid and absolute statements that organize information and allow individuals to interpret experiences and information in personally meaningful ways. They are seen to relate to oneself ("I am worthless"), the world ("The world is a competitive place") and the future ("Things will never get better") (Beck, 1983). Core beliefs lead to the development of dysfunctional assumptions. These are conditional statements in the form of "If...then....", for example, "If I do X, then Y will occur" (Beck, 1987). Dysfunctional assumptions can be conceptualized as "rules for living" in that they guide how experiences are interpreted and acted upon. They are considered dysfunctional because they affect the interpretation of situations in a biased or exaggerated way. They, in turn, influence the content of the most conscious representation of these underlying cognitive structures, automatic thoughts. These thoughts are described as automatic since they appear to come "out of the blue" and to be uncontrollable, characteristics that are particularly important in the treatment of mental health difficulties as they give the impression that the thoughts are facts and thus resistant to change. They are usually negative in content and are considered to play a role in the development and maintenance of mental health problems. Thus, cognitive theory is formulated in terms of cognitive structures as different levels of conscious awareness influencing observable behavior.

Cognitive behavioral therapy (CBT) was developed from cognitive theory. It works to modify biased and dysfunctional cognitive processing. Initially, CBT aims to educate patients about the reciprocal relationship between thoughts, feelings and behaviors, and to increase awareness of the automatic thoughts that occur in response to situations, events and interactions. The accuracy of these thoughts is then evaluated by assessing the available evidence supporting or refuting them, and considering

their utility in allowing someone to function adaptively in everyday life. They are then modified accordingly. Clients are encouraged to test out and experience new ways of thinking and behaving through the application of out-of-session homework "experiments" to see if their existing thoughts and beliefs are manifest in reality and whether the feared outcomes do occur[28]. Changes in behavior are promoted as different ways of interpreting situations and events are encouraged, and alternative outcomes are experienced. Thus, working at the level of conscious mediating cognitions (automatic thoughts) is the first line of approach in CBT. For cases of more long-term and enduring difficulties, a greater emphasis is placed on the role of the core beliefs. These are challenged and restructured using the same techniques as are applied to automatic thoughts, although it is considered that working at this level of cognitive structure takes much longer given their perceived rigid and inflexible nature[29].

The framework of cognitive structures which determine how incoming information is processed, consists of underlying core beliefs and assumptions and more conscious automatic thoughts, is deemed to apply to everyone, not only just those with psychological difficulties (Clark, & Beck, 1999). However, in most cases, cognitions do not cause distress. Indeed, it is considered that the negative cognitions and biased forms of cognitive processing characteristics of psychological difficulties reflect an exaggerated and persistent form of those seen in normal emotional functioning (Beck, 1991). For example, core beliefs are seen as having positive/negative polarity so that those without psychological difficulties will possess positive core beliefs (Clark & Beck, 1999), for example "I am a worthwhile person". Therefore, in reaction to stimuli, appropriate functional and adaptive beliefs are applied to incoming data, which elicit an appropriate response in terms of behavior, emotion or motivation (Clark & Beck, 1999). Thus, underlying beliefs about the outcomes of behaviors will be reflected in people's actions, including health-related ones. For example, someone may hold the core belief "I am a health conscious person" and the associated rule for living "If I take care of my health now, then this

[28] For example, Easychange expose the client to many behavioural, real world experiments. Also, a "therapy diary" help the client becoming aware of the relationship between cognitions on the one hand, and emotions and behaviours on the other hand.

[29] Easychange does not attempt to change core beliefs underlying mental problems. Rather, we believe that a long-term, highly individualized, client-counselor relationship is more appropriate to achieve such changes.

will benefit me in the future". It follows that their other thoughts and actions will then be in accordance with this belief. This suggests that techniques used in CBT to identify thoughts and beliefs are as applicable to those without mental health concerns as those with.

CBT has been demonstrated to be applicable to health and health related behaviors, in people with chronic illness and physical health problems, as well as in broader-based health promotion initiatives. In the former interventions, CBT works with illness-specific beliefs and cognitions that may be distorted or unrealistic and aims to help the client re-conceptualize their beliefs in a more functional, adaptive or coping-oriented fashion. From this, it is assumed that more adaptive behaviors in relation to their health status will be adopted. Examples of the application of CBT in chronic illness include diabetes (Henry, Wilson, Bruce, Chrisholm & Rawling, 1997), obesity (Braet, Van-Winckel & Van-Leeuwen, 1997; Liao, 2000), and myocardial infarction (Cowan, Pike & Budzynski, 2001), all of which require alteration of current lifestyle to improve health outcomes. For example, cognitive behavioral strategies have been shown to be helpful in supporting increases in physical activity in angina patients (Lewin et al., 2002). While a number of patients with chronic health problems receiving CBT may have concurrent psychological difficulties as well, this may not always be so and does not preclude the application of CBT techniques to those without. The focus of a CBT approach on the development of a repertoire of self-management skills and the patient's active participation and involvement in his/her change, seem ideally suited to a broader health behavior change context. That many health promotion approaches to behavior change mirror a CBT approach has been previously described (Graham, 1985), and examples of the use of CBT in this context exist. For example, CBT has been applied in a mental health promotion context to support stress management (Brown, Cochrane & Hancox, 2000; Kaluza, 2000), and "cognitive behavior modification" has been used in interventions promoting physical activity (Marcus, Nigg, Riebe & Forsyth, 2000).

In applying CBT to health-related behaviors, it may not be necessary or desirable to elicit and modify core beliefs. Working at the level of automatic thoughts and underlying assumptions is considered more appropriate for psychological problems that are not long-term or ingrained, as these cognitions are more easily tested and

thus more open to change than core beliefs (Mooney & Padesky, 2000). Core belief work is usually considered appropriate for working with complex and enduring mental health problems. Thus, working at the level of core beliefs may not be necessary to promote change in health behavior interventions. Additionally, the appropriateness of working at the level of core beliefs with people who do not suffer from psychological difficulties outside of specialized mental health care settings may be questioned.

A significant similarity between CBT and theories related to motivation and self-regulation, is that they to a large extent focus on beliefs and belief change as necessary for behavior change. Thus an intervention should aim at modifying existing unhelpful beliefs, strengthen pre-existing adaptive beliefs or create new ones. However, in motivation and self-regulation theories it is not specified how this could be done in practice. Generally, in most cases such interventions attempt to change beliefs by presenting information (Hardeman et al., 2002). In contrast, CBT targets behavior change through a combination of cognitive and behavioral techniques, for example thought challenging and behavioral experiments in which clients try out alternative ways of behaving based on new, more adaptive beliefs. The presentation of persuasive information alone is not considered sufficient to produce change within this paradigm; experience of both cognitive and behavioral change is required (Persons, 1989). For example, a CBT intervention aimed at increasing physical activity in persons who have experienced a heart attack may encourage participants to conduct a behavioral experiment to test out increasing physical activity (and the beliefs about their ability to do so) in an achievable way. This strategy of generating situations through which an individual can gain experience of making successful changes is akin to the guided mastery experience of interventions based on social cognitive theory (self-efficacy) (Bandura, 1997), and suggests that such techniques can be used successfully and effectively within health promotion and lifestyle change interventions.

A central part of CBT is the utilization of behavioral techniques. Such techniques include goal setting and action planning[30], monitoring progress through diaries[31], self-reward and relapse prevention strategies, including identification of high-risk

[30] See above description of these principles regarding self-regulation and implementation intentions.
[31] Easychange include a number of components which provide the client with feedback on progress.

situations and rehearsal of management strategies. While these strategies are integral to the application of CBT, their use is not dependent on, or limited to the use of CBT, and indeed interventions based on social cognition models have also utilized behavioral techniques. For example, studies based on social cognitive theory have proved efficacious in promoting dietary and physical activity change (Anderson, Winett, Wojcik, Winett & Bowden, 2001; Marcus, Owen, Forsyth, Cavill & Fridinger, 1998). Studies that are based on the theory of planned behavior have also incorporated behavioral techniques. For example, Hardeman and colleagues' (2002) systematic review noted that after information giving and persuasion, skills learning, goal setting and action planning were the most commonly used intervention techniques.

3. Affect regulation

Affect regulation refers to efforts undertaken to modify or maintain one's mood (Lischetzke & Eid, 2003). The ability to effectively regulate one's mood state is considered a crucial part of effective and adaptive psychological functioning (Larsen, 2000, p. 129). Indeed, an inability to effectively regulate one's affective states has specifically been linked to the development of mental illness (Bradley, 1990) and psychopathology (van Praag, 1990).

Several models have been proposed to explain the mood regulation process (e.g. Carver & Scheier, 1990; Gross, 1999). Larsen (2000) described a control model of mood regulation based on Carver and Scheier's (1982) cybernetic control model of regulation. In this model, Larsen assumes that each individual has a 'set' affective state that they find most appealing and that they constantly monitor their current mood state to check how it compares to their desired state. If they notice that their current mood state is discrepant from their desired mood state, they take active measures to moderate the discrepancy through the use of self-regulation strategies.

Larsen and Prizmic (2004) have further argued that whilst self-regulatory efforts may be focused on the immediate reduction of the discrepancy between current and desired mood states, the overarching goal of mood regulation efforts is to maintain satisfactory levels of subjective well-being (SWB). SWB is considered to be the average levels of positive and negative affect an individual generally experiences

(Diener & Larsen, 1993) and has, therefore, quite a long-term perspective. According to Larsen and Prizmic, in order to regulate one's feelings of SWB, one must regulate, more specifically, one's experiences of PA and NA. In accordance with Larsen's (2000) control model of affect regulation outlined above, individuals will make use of affect regulation strategies in order to do so.

Many studies have been conducted with the aim of developing a complete taxonomy of the self-regulation strategies that individuals (can) use to alter their mood states (see Morris & Reilly, 1987; Parkinson & Totterdell, 1999; Thayer, Newman & McClain, 1994). Based upon his own empirical studies, Larsen (2000) suggested that all mood regulation strategies were either behavioural or cognitive in nature, and were directed towards altering either the emotion or the situation. Below is a brief description of the some strategies used to down-regulate negative affect that has been incorporated in various components of Easychange.

Cognitive reappraisal

In order to down-regulate negative moods, individuals often try to reinterpret the situation that is causing their mood in order to view it in a more positive light (Larsen & Prizmic, 2004). The old saying 'looking on the bright side' describes this strategy quite adequately. By refocusing one's attention on the positive aspects of a situation and deemphasising the negative, one can alleviate a negative mood. Davis and colleagues (1998) have reported that there are also long-term benefits to being able to find something positive in a predominantly negative situation. For example, in their study, they found that following the death of a loved one, those individuals who were able to find something positive in the sorrowful experience were not as unhappy six months later as those who could not[32].

Distraction

Distracting oneself from one's bad mood by engaging in an alternate activity is a commonly used and effective strategy to escape a negative mood (Larsen & Prizmic, 2004). Such distracting activities could include watching television, reading a book, working, etc. Larsen and Prizmic hold that the reason distraction is a useful mood

[32] Users of Easychange applications learn cognitive reappraisal and are guided through a high number of practical exercises as part of the programme.

regulation strategy is that it helps stop individuals from ruminating. Rumination is defined as "the tendency to focus on one's symptoms of distress, and think about the causes and consequences of these symptoms in a passive and repetitive manner" (Nolen-Hoeksema & Corte, 2004, p. 411). As rumination has been shown to prolong episodes of anxiety and sadness (Nolen-Hoeksema, 2003), to be ineffective in the down-regulation of negative moods (Morrow & Nolen-Hoeksema, 1990), and to predict the development of depression (Nolen-Hoeksema, 2000; Nolen-Hoeksema & Larson, 1999), distraction can be a very useful tool to break such ruminative cycles[33].

Taking action or making plans

In an effort to alleviate their negative mood states, some individuals take action to solve the problem causing their mood (Larsen & Prizmic, 2004). Termed 'problem-focused coping' in the coping literature, this strategy has been shown to be an effective strategy in the reduction of stress, especially when compared to the alternative 'emotion-focused coping' (Lazarus, 1966). In addition, it has been reported that making plans to avoid similar problems in the future (when taking action would not alter an outcome) is also an effective and frequently used strategy to improve negative moods (Larsen & Prizmic, 2004)[34].

Pleasant activities and self-reward

Individuals often reward themselves by engaging in pleasant activities that make them feel good or by treating themselves to something, they may desire when attempting to down-regulate a negative mood (Larsen & Prizmic, 2004). Fichman et. al. (1999) found that rewarding oneself with pleasant activities was the most successful negative mood regulation strategy, while Faber and Vohs (2004) argue that self-gifting (or buying gifts for oneself) can effectively decrease NA or increase PA[35].

Exercising

Exercising is a well-established mood regulation strategy (Larsen & Prizmic, 2004). Through the publicity of research in recent years highlighting the link between exercise, endorphin release, and mood improvement, exercise is widely believed to

[33] The instant help of Easychange provides both distraction and affect regulation.
[34] Note the above description of role of making implementation and coping plans as part of Easychange applications.
[35] Easychange contains several elements which make use of the principle of self-reward.

be one of the best ways to manage moods. Watson (2000), however, holds that whilst it has been found that clinically dysphoric people may show mood improvement after exercising, other studies in non-clinical populations have found mixed evidence for an association between the exercise and mood improvement. It may be that, in the non-clinical populations, exercising results in the greatest improvements in mood in those who regard exercising as a pleasant activity that they enjoy and regularly engage in, although this is merely speculation[36].

Social support

A very common strategy implemented to down-regulate negative affect is to spend time with others (Larsen & Prizmic, 2004). Tice and Baumeister (1993) clarify, however, that it is important when one socialises to improve negative mood states, to choose to be with others who are not also experiencing negative moods. Clearly, this would be an unhelpful strategy to choose. Larsen and Prizmic suggest that socialising is a useful technique for several reasons. The activity is a form of distraction in itself (typically a positive one) and thus helps one to get one's mind off one's problems. Alternatively, this strategy allows individuals the chance to share their feelings with others, which, in turn, provides opportunities for them to alter the way they are thinking about their problem through engaging in the cognitive reappraisal process[37].

Detached mindfulness

How we relate to our thoughts affects how we feel. Worry, rumination and fixation of attention on threat lead to negative affect (Wells, 2009). Wells have developed metacognitive therapy for helping the client relate to thoughts in a new way, called detached mindfulness. This is a state of awareness of internal events, without responding to them with sustained evaluation, attempts to control or suppress them, or respond to them behaviorally. It is exemplified by strategies such as deciding not to worry in response to an intrusive thought, but instead allowing the thought to occupy its own internal space without further action or interpretation in the knowledge that it is merely an event in the mind (see Wells, 2009). Easychange use digital auditory exercises both to help people obtain detached mindfulness (for example

[36] In accord with research Easychange contains elements which focus upon the role of exercise in both stress and affect regulation.

[37] Easychange is constructed in order to capitalize on this by being supportive of interpersonal communication

viewing thoughts as clouds floating by at the sky), and a specific exercise to train their attention. The attention exercise has been proved effective for various disorders such as hypochondriasis (Papageorgiou & Wells, 1998), panic and social phobia (Wells, White & Carter, 1998) and depression. (Papageorgiou & Wells, 2000). And lately also for hearing hallucinations in patients with schizophrenia (see Valmaggia, Bouman & Schuurman, 2007).

Easychange also use strategies used to regulate positive affect. A number of mood regulation strategies seem to provoke good mood or to be helpful to maintain a positive affective state (see Lyubomirsky 2008). Below is a brief description of some of those that have been incorporated in Easychange.

Positive focus

As opposed to cognitive reappraisal (which, as outlined above, involves reinterpreting the way one views negative events or situations causing bad moods), maintaining a positive focus requires one to focus on the positive aspects in one's life (Larsen & Prizmic, 2004). Here the saying 'Counting one's blessings' is an apt descriptor. Emmons and McCullough (2003) randomly assigned participants to complete daily lists of either complaints, things that they were grateful for, or neutral things for either 3 or 10 weeks. They found that across the majority of well-being measures, those individuals who had kept lists of things they were thankful for had higher levels of well-being. Feeling gratitude and maintaining a positive focus appear, therefore, to be important tools for the up-regulation of positive affect[38].

Expressing positive feelings

Laughing, smiling and using humour are strategies that can be used in the maintenance or up-regulation of positive affect (Larsen & Prizmic, 2004). As previously stated, researchers have claimed that mood can be controlled through actual emotional expression (emotional expressivity effect). Duclos and Laird (2001) argue, therefore, that expressions of positive affect could increase or maintain positive mood states. Studies on the topic have tended to focus on the use of humour and its relationship to coping with stress, and these have shown a positive

[38] Numerous components of Easychange support such processes.

relationship between the use of humour and one's ability to deal effectively with stress (Bonanno & Keltner, 1997; Kuiper & Martin, 1998). In addition, Lefcourt (2002) presented data that suggested that people with a sense of humour often had good immune systems and were able to recover from illness more quickly than those without a sense of humour. As this data was correlational, causality cannot be assumed, however, it appears that the role of humour should not be underestimated as a strategy to maintain good psychological health.

Layer 3: Predictors of successful change

Psychological theory and research has been concerned with explaining and predicting successful change. No doubt, human change is a complex matter. Thus, no theory or model, nor even a selection of theories and models, are capable of providing a detailed and valid explanation of all varieties of human change. Accordingly, models and theories are just crude representations of what is going on in the real world.

Nevertheless, theories and models may help pinpoint some main processes or causal mechanisms. Moreover, they may inform us about which predictors are promising candidates for interventions in order to help an individual change successfully. The above described theories, models and processes represent our guidance for the selection of such predictors to be included in Easychange. These predictors represent targets of intervention, since they again predict the outcome of the change process. When applications are made in specific behavioral domains, the list of predictors must be adjusted; some predictors may be added while others are not relevant within a specific setting.

The predictors represent the working level at which the "intervents"[39] are constructed. Thus, intervents are information units (messages) constructed in order to stimulate, influence, remove, change or manipulate a specific predictor of change. Moreover, the intervent occurs in the program at a reasoned timing along the tunnel of change. Additionally, each intervent is communicated through a thoroughly selected digital channel.

[39] Intervents are described above.

In constructing Easychange, we restricted ourselves to the identification of a limited set of predictors of successful change. In future versions of Easychange this list can be made longer or shorter[40]. We operate with 24 generic predictors. In addition to these, we also add domain specific predictors.

However, it is important to note that we do not consider specific predictors only to be important early or late in the chronology of change. Rather, some predictors are clearly more important early, but they remain to be influential throughout the whole change process, and vice versa for predictors that are mainly conceived of as being important later in the change chronology. Furthermore, the ordering of the description of the predictors is generic, meaning that the relative importance of them throughout the change chronology must be adjusted according to the specific domain of behavioral change addressed when a **specific** application is made.

[40] Pending for example developments in psychological theory and research.

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