

**DETERMINANTS OF ADAPTIVE BEHAVIOR AMONG OLDER PERSONS  
SELF-EFFICACY, IMPORTANCE AND PERSONAL DISPOSITIONS AS  
DIRECTIVE MECHANISMS**

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**ABSTRACT**

Successful aging calls for effective adaptation, which in turn implies flexible use of coping strategies to optimize personal functioning and well-being. The present paper studied adaptive choice behavior of older, independently living persons faced with complications in their houses. The goal was to gain insight in the concrete coping process and its outcome -- in terms of the choice of assimilative vs. accommodative strategies -- and in the role of three determinants on this process. The determinants were perceived self-efficacy, importance of the problem and personal dispositions (flexibility and tenacity). A sample of 199 independently living older persons participated in an experiment that was based on a scenario and questionnaire method, with problems stemming from the domain of independent living. Results mainly underline the crucial role of perceived self-efficacy, and are discussed in view of the concept of successful aging.

Effective adaptation is an integral part of successful aging. This does not necessarily imply instrumental or problem-focused, goal-directed coping, but rather the flexible use of strategies, to optimize personal functioning and well-being within the constraints of personal competence and resources (Baltes & Baltes, 1990). Successful aging requires competence, not in the restricted sense in which it is often used in aging studies, merely referring to the ability to perform the activities of daily living, but competence in its broadest sense, involving cognitive, personality, material and social resources. These factors have been found to influence everyday functioning among older people significantly (Baltes & Lang, 1997; Pushkar,

et al., 1997). In the present study, we will try to gain more insight in the actual appraisal and coping process, by studying concrete coping behavior and how various factors influence the choice of a certain adaptive strategy from the many options that exist.

The following example may help to illustrate this point:

A 78 year-old woman finds herself in the following situation: her sense of hearing has decreased rapidly lately. When she talks to people in person, the problem isn't that serious, but using the telephone has become very hard, even at its loudest. This poses a serious problem to her, because her children live far away and cannot visit her every day. They used to phone her very regularly, but now she's afraid she may have to do without this contact. How can she cope with this problem? She could learn to phone her children using a computer, through the Internet. Or she could ask the woman next door to help her with calling her children. She could also try to accept that phoning is no longer an option. Maybe her children will come and visit her more often.

Adaptive strategies can be categorized as assimilative adaptations on the one hand, or as accommodative adaptations on the other. Assimilation refers to problem-focused, instrumental activities, aimed at preventing or alleviating developmental losses in domains that are relevant to the individual's self-esteem and identity. Accommodation refers to processes by which personal goals and frames of self-evaluation are adjusted to changes in action resources and functional capacities (Brandtstädter, Wentura & Greve, 1993). In this sense, we could characterize the first option, calling with a computer, as assimilative. The third one, giving up phoning and hoping they will visit more often is clearly accommodative. The option involving help from others holds some assimilative qualities, but should be regarded as accommodative because it requires accepting invasion of privacy and loss of autonomy, which are considered central goals to most persons.

Brandtstädter and Renner (1990) found that older cohorts tended to report more accommodative coping strategies than younger ones. In other words, they adapted themselves rather than the environment to cope with problems (Brandtstädter & Renner, 1990; Filion, Wister & Coblenz, 1992; Wister, 1989). The reasons for these findings are still unclear, but could be sought in many factors, for instance in the type of problems older people are confronted with, in changing resources and perceptions of control, or in shifting goals and values. Much could be learned from studying these factors simultaneously.

### **SELF-EFFICACY, IMPORTANCE, AND DISPOSITIONS AS DIRECTIVE MECHANISMS OF ADAPTIVE BEHAVIOR**

When confronted with a situation calling for adaptation, various appraisals are made by the person, centered on the questions: 'What is at stake for me?', 'What are my options and what is their outcome?', 'Can I perform the required actions for these options?'. These appraisals are influenced by different factors and mutually influence each other (Lazarus & Folkman, 1984). First, beliefs about personal competence and the demands of adaptive actions are fundamental to the question whether certain actions can be performed. These beliefs are integrated and estimated on a situation specific level in the 'perceived self-efficacy' concept. In addition, the importance (or centrality) of the blocked goal influences appraisals significantly: the more important the goal, the more is at stake and the more critically options will be assessed. Finally, personal dispositions related to coping behavior could shape the adaptive behavior of persons in concrete situations (Lazarus & Folkman, 1984). Below we will discuss the effects of self-efficacy, importance and personal dispositions on adaptive behavior in more detail.

#### **Perceived Self-efficacy**

Perceived self-efficacy is defined as people's judgments of their capabilities to organize and execute the courses of action required to attain designated types of performances (Bandura, 1986). Self-beliefs of efficacy exert an influence on human functioning through motivational, cognitive and affective processes and shape developmental trajectories by influencing the choice of pursuits and selection of environments (Bandura, 1992). For instance, people with higher levels of self-efficacy will set higher goals for themselves and be more persistent in attaining these goals, which results in better performance.

From this perspective, self-efficacy perceptions could also influence the choice of an adaptive strategy, when, in a certain problem situation, several coping alternatives are available. Consider for instance the woman in the example that was given earlier. If this woman considered learning to use a computer as the most optimal solution and within her capabilities (high self-efficacy), she would be more likely to choose this option than in the instance where she would consider it as exceeding her capabilities. In this latter instance she would rather choose one of the alternative coping options, even if she judged them as less optimal. In earlier research self-efficacy was found to influence older individuals' choice of adaptive strategies in real life (Slangen - de Kort, Midden, & Van Wagenberg, 1998). In addition, self-efficacy was shown to have a significant effect on the choice of assimilation for concrete hypothetical problem scenarios in the domain of independent living (Slangen - de Kort, 1999).

## Importance

Besides perceived self-efficacy, characteristics of the problem situation itself could also influence appraisals and adaptive behavior. The most relevant characteristic in the present focus is importance of the problem. The term importance refers to the centrality of this goal to the person, or in other words, to its place in the goal hierarchy. If a goal that is very important to a person is hindered, this person will be highly motivated to solve the problem in a goal-directed, assimilative way. If, for instance, the woman in the example in the introduction feels that maintaining close contact with her children is very important, she will likely be more willing to spend time and effort in learning to use the computer than if she did not feel this was important.

The mechanism underlying the effect of importance differs from the one underlying the role of self-efficacy. Importance mainly influences primary appraisals, concerning the question 'What is at stake for me?' (self-efficacy appraisals fall into the category of secondary appraisals; Lazarus & Folkman, 1984). As was argued before, the more is at stake for persons, the stronger their commitment to solving the problem effectively. Importance thus reflects an individual's commitments and beliefs. These influence appraisal by (1) determining what is salient for well-being in a given encounter, (2) shaping the person's understanding of the event, and (3) providing the basis for evaluating outcomes (Lazarus en Folkman, 1984). Changes in the importance of a problem situation can therefore influence evaluations of coping alternatives. For instance, they may cause a certain option that was appraised as reasonably attractive for a non-important problem to be appraised as highly unattractive for an important one. Since in the present study we will try to manipulate importance of a problem it would be highly informative to not only measure respondents' choice between a number of coping options, but their response efficacy evaluations (perceived effectiveness) regarding these options as well. We expect that the various adaptational alternatives will be judged differently, depending on the importance of a particular problem.

## Personal Dispositions: Tenacity and Flexibility

Perceived self-efficacy and importance are of key importance in this respect, but they cannot fully account for the variety and efficacy of coping mechanisms. Brandtstädter (1992) argues that besides perceptions of self-efficacy, two dispositions influence individuals' coping behavior: flexibility and tenacity. Flexibility is defined as the capability or readiness to disengage from blocked options and to flexibly readjust one's goals and is an important factor that reduces the risk of dissatisfaction and depression in later life. Tenacity refers to the persistence with which people hang on to their goals in the face of obstacles. Tenacity and flexibility are independent dispositions that, according to Brandtstädter et al. (1993), are respectively related to the two basic coping processes: assimilation and accommodation. Brandtstädter and Renner (1990) argue that, in the initial stage of a coping episode, assimilative tendencies are expected to dominate; accommodative tendencies are activated to the extent that active, assimilative attempts to change the situation become or are perceived as ineffective. People who are both tenacious and flexible are hypothesized to adapt most efficiently to changing circumstances.

In an earlier study flexibility and tenacity were used to explain the choice of assimilation in concrete problem scenarios (Slangen - de Kort, 1999). Tenacity was found to influence assimilation

positively, in accordance with theoretical considerations. The effect of flexibility was moderated by self-efficacy: only in situations of low perceived self-efficacy, did flexible persons abandon assimilation more easily than inflexible persons did.

## PURPOSE AND RATIONALE

The purpose of this study was to investigate the role of self-efficacy, importance and the dispositions tenacity and flexibility with regard to the choice of adaptive strategies by older people, in concrete hypothetical problems in their home environment. The research instrument was based on the scenario and questionnaire approach, in which respondents read or listen to a scenario and answer questions that follow. As will be described in the Methods section, four problem scenarios were designed and for each of them, a set of three solutions was formulated, one of which was assimilative. Importance and self-efficacy were manipulated, tenacity and flexibility were measured.

The goal was to work with very concrete and recognizable problems and coping scenarios for reasons of external validity (Lawton, 1987). Rather than having the respondents evaluate general or abstract issues, they were asked to visualize these concrete problem situations and respond to specific adaptive strategies as if they themselves were experiencing these problem episodes. The use of scenarios or vignettes has often proved successful in research on practical or everyday problem solving (s.f. Cornelius & Caspi, 1987; Denney & Pearce, 1989). The choice of scenarios and related solutions was based on an empirically derived inventory of real-life problem situations of independently living older persons (Slangen - de Kort *et al.*, 1998). This set naturally cannot represent the total range of real-life situations and coping alternatives. However, care was taken to choose situations from various life domains and differing physical limitations. Recognizing that the value of a scenario approach depends heavily on the subjects' ability to project themselves into the situation, much time and effort was expended to develop realistic scenarios and coping alternatives.

## Hypotheses

In light of the considerations described above, the expectations regarding the outcomes of the study can be summarized as follows: first, it is hypothesized that self-efficacy has a significant positive effect on the intention to choose an assimilative adaptation strategy (main effect of Self-efficacy). If people feel highly efficacious of solving their problems in a goal-directed way, they will be more likely to engage in this proactive strategy.

Second, we expected the importance of the problem to interact with self-efficacy. As the importance of a problem increases, the person will be more committed to finding the most optimal solution and therefore be more willing to expend time and energy in attaining it. In the present study, these considerations primarily apply to the assimilative, technical solution, since these are most goal-directed. For important problems, with much at stake, perceptions of low self-efficacy should have a smaller impact than for less important problems, where the person is sooner expected to settle for a somewhat less assimilative adaptation. We therefore hypothesized that the effect of self-efficacy would manifest most in the low-importance condition, i.e. an interaction effect between Self-efficacy and Importance.

The dispositions tenacity and flexibility were measured and taken into account in the present study, in order to replicate the findings of the previous experiment with a comparable sample (Slangen - de Kort, 1999). We therefore expected a main effect of Tenacity: relatively tenacious persons are expected to show higher intentions to assimilate than less tenacious persons, since they are more persistent in complicated situations. Lastly, we expected an interaction between Self-efficacy and Flexibility: flexible persons are said to modify their standards and disengage from goals more easily, but only in situations where these goals or options are blocked -- e.g. in situations of low self-efficacy. The effect of flexibility should therefore only emerge in the low self-efficacy condition.

In order to study whether response efficacy evaluations of the coping alternatives vary with importance of the problem situation, these were assessed for all three alternatives. This should provide us

with a better insight into the actual coping process. We expected that for important problems, assimilative options would score higher on response efficacy than for unimportant problems since assimilative strategies are goal-directed. The opposite effect could occur for the accommodative strategies, especially the personally directed coping options, since these provide the least goal-directed solutions.

## METHOD

### Participants and Design

Participants were 199 independently living older individuals (140 female, 59 male), with ages ranging between 61 and 84 ( $M = 71.73$ ,  $SD = 5.07$ ), who were paid the equivalent of 10 US\$ for their participation. They were recruited via several local networks of the Catholic Association of Senior Citizens (KBO)<sup>1</sup> in the south of the Netherlands. Their education level was representative for this age group ( 0-6 years elementary school: 42%; lower vocational education: 21%; advanced elementary education: 16%; high school or secondary (vocational) education 16%; higher (vocational) education: 5% ). Participants were randomly assigned to one of the four experimental conditions.

The experiment constituted a two (Self-efficacy: high vs. low) by two (Importance: high vs. low) by two (Flexibility: high vs. low) by two (Tenacity: high vs. low), between-participants design. The first two factors were experimentally manipulated, the latter two were measured and thus can be treated as quasi-experimental factors. All analyses of variance (ANOVA's) were conducted according to this design.

Participants were interviewed individually by trained interviewers. As a cover story, participants were told that the aim of the study was to examine the needs and preferences of older persons with regard to independent living. The interviews lasted approximately one hour.

### Materials

Four scenarios were used in the present study and for each of these problem situations, three adaptive strategies were described (an example of one of the scenarios and its solutions was given in the introduction of this manuscript, short descriptions of the others are given in the appendix). For every scenario, one of the solutions described an assimilative adaptation (of the physical environment) and the other two described less assimilative, more accommodative strategies, one of which concerned accepting help from others and one concerning psychological adaptation. The averaged preference scores of the assimilative solutions over all four problems served as the dependent variable.

We will refer to the assimilative adaptation as environmental and to the accommodative adaptations as social and personal respectively. The assimilative adaptations had the highest response efficacy (were most problem-focused) and involved an environmental modification or the use of a technical device. However, the alternatives that were presented were also valid and moderately attractive

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<sup>1</sup> The KBO is one of three major associations for senior citizens in the Netherlands. They defend older peoples interests and are organized in many local networks that organize a wide variety of easily accessible activities.

solutions for the problems presented, although less than the physical adaptation.

The scenarios have been used and validated in an earlier study with a comparable sample (Slangen - de Kort, 1999). Internal consistency of the scale was satisfactory (Cronbach's  $\alpha = .72$ ). A test-retest reliability study showed that scores at baseline correlated substantially with the scores of a follow-up study three weeks later ( $r = .73$ ,  $p < .001$ ). Convergent validity of the choice measurement as used in this study (discussed later) with an intention measurement was high ( $r = .82$ ,  $p < .001$ ). In sum, the findings suggest that the scenario and choice measurement provide a reliable and robust methodology.

### **Manipulation of Self-efficacy**

The descriptions of the problem situations as well as the solutions were identical for the two experimental conditions. However, a statement was added to the description of the assimilative solution in which perceived self-efficacy was manipulated using a combination of instructions and persuasion. (Persuasion is one of the main instruments to influence self-efficacy (Bandura, 1986)). An example is given below.

High self-efficacy: An apparatus like that may look rather complex, but using it is really rather simple, somewhat similar to using a television and a typewriter. Nowadays many people can operate a computer, young people, but older people as well, so she will be able to master it too.

Low self-efficacy: An apparatus like that looks rather complex, somewhat similar to a television and a typewriter, but using it is very complicated. Nowadays many people can operate a computer, but these are primarily young people, at her age she will not master it that easily.

Only these statements differed for the two experimental versions. Perceived self-efficacy judgments related to the two alternative solutions were not manipulated. The exact same manipulations of self-efficacy were used in the earlier experiment; there the manipulations proved effective and did not influence response efficacies of the assimilative options (Slangen - de Kort, 1999).

### **Manipulation of Importance**

In order to manipulate perceived importance of the problem, the four scenarios were rewritten into two versions each: one in which the consequences were very serious and one in which they were only moderately serious. In the high importance version, more was at stake for the person than in the low importance version. The descriptions of the solutions remained unchanged. The scenario that was given in the introduction is an example of the 'high importance' condition. Below is the corresponding scenario in the 'low importance' condition:

A 78 years-old woman finds herself in the following situation: her sense of hearing has decreased rapidly lately. When she talks to people in person, the problem isn't that serious, but using the telephone has become very hard, even at its loudest. This poses a problem to her, because some of her relatives live far away and cannot visit her regularly. Luckily, her children do not live far away. How can she .... *(The scenario continued as in the earlier example, except that in the solutions, "children" was replaced by "relatives")*

### **Measurement of Tenacity and Flexibility**

The dispositions tenacity and flexibility were measured using the translated scales of Brandtstädter & Renner (1990). Participants were asked to fill out the questionnaire on paper themselves. Both scales consisted of 15 items, measured on 5-point Likert scales (I do not agree at all - I agree completely). The flexibility scale consisted of facets of accommodative processes related to disengagement, reorientation, and acceptance. Tenacity items referred to assimilative tendencies: maintaining a chosen course of action even under difficulty or increasing the valence of blocked goal perspectives. Aspects of convergent and discriminant validity and psychometric properties are discussed in Brandtstädter and Renner (1990).

Some of the items of both the tenacity and flexibility scales were recoded so that high scores on these variables were related to respectively high tenacity and flexibility. The internal consistency of the flexibility scale was moderately high (Cronbach's  $\alpha = .71$ ,  $M = 2.73$ ,  $SD = 0.52$ , median at 2.7), as was that of the tenacity scale (Cronbach's  $\alpha = .71$ ,  $M = 2.22$ ,  $SD = 0.58$ , median at 2.1). The low

correlation between the two scales (bivariate correlation:  $r = .05$ ,  $p = 0.27$ ), in accordance with earlier uses of the scales, indicates the independence of the two constructs. Participants were categorized in the low or high flexibility and low or high tenacity group, based on the median-split.

### **Dependent variable**

After the tenacity and flexibility scales had been filled out, the problem situations were read aloud by the interviewer and discussed one by one in random order. Respondents were instructed to listen carefully to each story and to imagine themselves in the situation described and then answer the questions that followed. The order in which the three adaptive strategies were presented varied over the problems. Following every description of a problem and the corresponding solutions, a set of questions was presented. Participants were told that there were no right and wrong answers and that it was important to express how they really felt.

First participants were asked to report the option they would choose and then which of the two alternatives they would choose second. This resulted in a rank ordering of the three options (first choice = 2, second choice = 1, third choice = 0). The scores for the assimilative (environmental) options of the four scenarios were factor analyzed. Only one factor emerged with eigenvalue  $> 1$ , the factor loadings were .68, .66, .44, and .65 respectively. The resulting factor score was used as the dependent variable in this study: 'choice of assimilation'.

### **Checks**

Then a self-efficacy measurement followed. This measurement contained three unipolar 5-point items concerning implementation of the environmental modification: 'Do you think it is complex to ...' (1 = very complex, 5 = not at all); 'Do you think one has to invest a lot of time and effort into ...' (1 = no, 5 = yes, definitely); 'Do you think you would succeed in ...' (1 = no, 5 = yes, definitely). For every problem, we checked whether the self-efficacy manipulation was strong enough. The 3 items were combined and a t-test was performed (criterion:  $p < .05$ ). When all t-tests proved significant, the sets of items of the four separate problem scenarios were combined into one self-efficacy check-scale (scores ranging from 1 to 5). The internal consistency of this scale was satisfactory: Cronbach's alpha = .73 (12 items).

Subsequently, participants rated the response efficacy of all three adaptive strategies on 11-point scales (0% solved - 100% solved). These scores were also summed over the four scenarios, resulting in three scores that represented the perceived quality of the three types of solutions (environmental, social, personal).

After the four problem scenarios were discussed, some demographic variables were measured (age, gender, education level) and lastly, the importance check, consisting of two types of measurements, was filled out. The scenarios were read out loud again, one by one, in the same order as they had been discussed, but only after a new scenario had been read. This new scenario was identical for the two importance conditions and served as an 'anchor'. First, importance of the problem was measured on linear scales of 10 cm. The ends were labeled 'not important' and 'of vital importance'. Participants were asked to place a x-mark on the lines. Then participants scored the scenarios on a 6-point scale, with all points labeled (ranging from 1 = 'not important' to 6 = 'very important'). Both scores were standardized and summed over the scenarios, resulting in one importance check variable (internal consistency: alpha = .73). This concluded the interview. Afterwards, the participants were debriefed.

## **RESULTS**

### **Manipulation Checks**

In order to test the manipulation of perceived Self-efficacy and its independence from the remaining factors, an ANOVA was performed, with the self-efficacy check as the dependent variable and

Self-efficacy, Importance, Tenacity, and Flexibility as independent factors. The main effect of Self-efficacy proved highly significant,  $F(1, 181) = 18.06, p < .001$  ( $M_{low} = 3.2, M_{high} = 3.6, SD = 0.6$ ). No other significant effects emerged. A similar analysis was performed with the importance check as the dependent variable. The main effect of Importance was highly significant,  $F(1, 179) = 25.38, p < .001$  ( $M_{low} = -.42, M_{high} = 0.44, SD = 1.2$ ). No other significant effects occurred. It was concluded that both manipulations were successful and not disturbed by the remaining factors.

Table 1. Assimilation Choice by Self-efficacy, Importance, Flexibility, and Tenacity

	<b>Self-efficacy</b>			
	<b>low</b>		<b>high</b>	
	Importance		Importance	
	low	high	low	high
<b>Flexibility low</b>				
Tenacity low	-0.60	-0.84	0.60	0.27
Tenacity high	0.06	0.43	0.07	0.36
<b>Flexibility high</b>				
Tenacity low	-0.54	-0.41	0.45	-0.37
Tenacity high	0.10	-0.37	0.42	0.29

**Note.** Values are means.

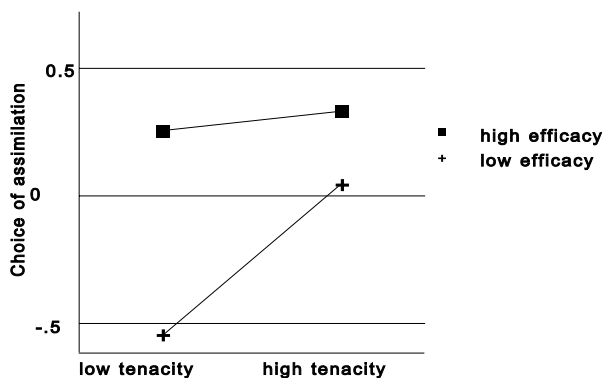


Figure 1. Choice of assimilation by Efficacy and Tenacity.

### Analysis of Variance: Choice of Assimilation

The dependent variable in this study is the choice of assimilation. Mean values for every experimental condition are given in Table 1. This variable was subjected to a full model ANOVA. The analysis



rendered significant main effects of both Self-efficacy,  $F(1,178) = 14.23, p < .001$ , and Tenacity,  $F(1,178) = 6.13, p = .014$ . The effects are visualized in Figure 1 Both Self-efficacy and Tenacity had a positive effect on assimilation. In addition, we found a significant interaction between Self-efficacy and Tenacity,  $F(1,178) = 4.55, p = .034$ . This was further qualified by a significant three-way interaction between Self-efficacy, Flexibility and Tenacity,  $F(1,178) = 4.187, p = .042$ . In the high flexibility condition, only the main effect of Self-efficacy is significant ( $p = .002$ ). In the low flexibility condition, both main effects and the interaction effect of Self-efficacy and Tenacity are significant (all  $p < .05$ ). The interaction effect implied that the effect of Tenacity was strongest in the low Self-efficacy condition. This analysis is illustrated in Figure 2.

The hypothesized interaction between Self-efficacy and Flexibility was not significant,  $F(1,178) = 0.042, p = .837$  (see Figure 3). There was no significant main or interaction effect of Importance. The remaining effects were not significant. The findings will be discussed after the analyses of the response efficacies.

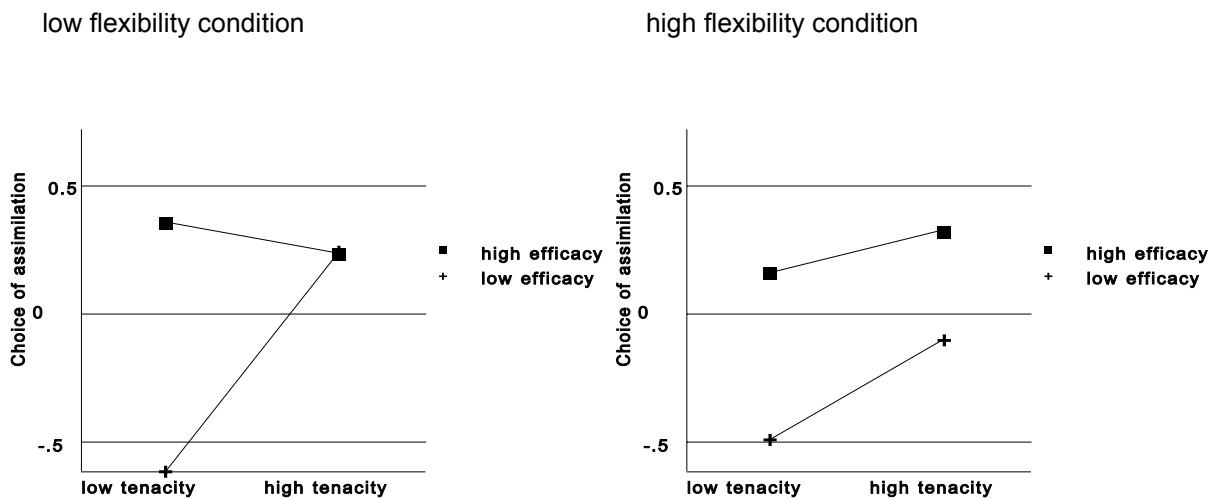


Figure 2. Three-way interaction on choice of assimilation: Effects of Efficacy and Tenacity in low and high Flexibility condition.

### Analyses of Variance: Response Efficacies

Part of the variance in the choice of an adaptive strategy can be explained by the perceived quality or effectiveness (response efficacy) of the various coping options<sup>2</sup>. As was explained in the introduction, these evaluations may vary with the importance of the problem situation. The second step in the analyses therefore involved ANOVA's with the response efficacy scores of the three types of adaptive strategies dependent. Mean values of these three variables for every experimental condition are given in Table 2. These analyses may also shed more light on the absence of hypothesized effects of Importance. Relevant results are reported in Table 3.

Table 2

#### Response efficacy of three adaptations by Self-efficacy, Importance, Flexibility, and Tenacity

<sup>2</sup> In a stepwise regression analysis with assimilation choice dependent and self-efficacy and the three response efficacy (RE) scores independent, all variables were entered: self-efficacy (Beta = .32,  $p < .001$ ), REenvironmental (Beta = .32,  $p < .001$ ),

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		Self-efficacy			
		low		high	
		Importance		Importance	
		low	high	low	high
<b>Flexibility low</b>					
Tenacity low	Environmental Adaptation	23	29	33	31
	Social Adaptation	17	23	17	19
	Personal Adaptation	12	23	18	15
Tenacity high	Environmental Adaptation	29	34	34	32
	Social Adaptation	15	19	20	21
	Personal Adaptation	16	14	17	17
<b>Flexibility high</b>					
Tenacity low	Environmental Adaptation	29	33	32	31
	Social Adaptation	21	22	17	26
	Personal Adaptation	18	16	19	22
Tenacity high	Environmental Adaptation	32	35	32	33
	Social Adaptation	21	24	19	20
	Personal Adaptation	17	15	16	18

Note. Values are means on scales from 0 (low) to 40 (high).

Table 3. Results of Analyses of variance on three response efficacies

	environmental adaptation <sup>1)</sup>	social adaptation <sup>1)</sup>	personal adaptation <sup>1)</sup>
	F	F	F
Self-efficacy	3.92 *	0.03	1.23
Importance	4.02 *	10.48 ***	0.52
Tenacity	10.00 **	0.03	2.39
Flexibility	1.93	4.02 *	2.14
Self-efficacy * Importance	9.40 **		
Self-efficacy * Flexibility	4.42 *		

Note. <sup>1)</sup> Results based on ANOVA with main effects and 2-way interactions. Only main effects and significant interactions are reported.

<sup>2)</sup> \* = p<.05, \*\* = p<.01, \*\*\* = p<.001

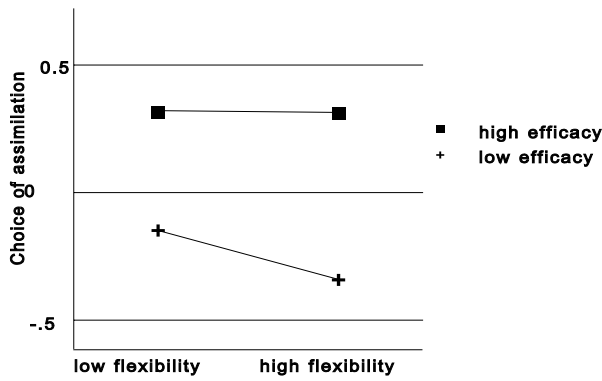


Figure 3: Choice of assimilation by Efficacy and Flexibility

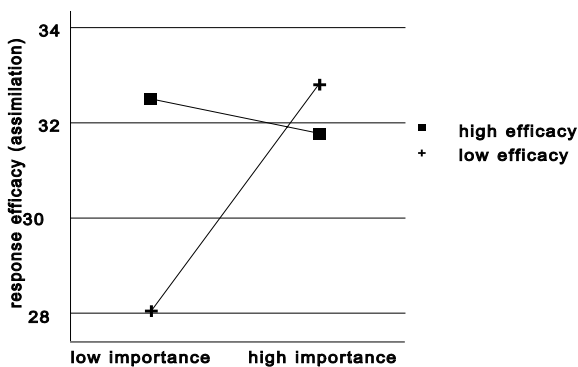


Figure 4: Response efficacy of assimilation by Efficacy and Importance

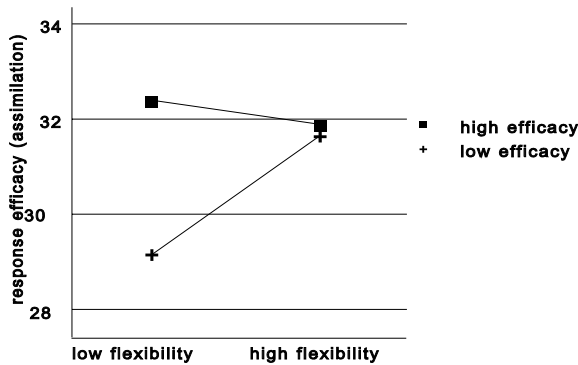


Figure 5: Response efficacy of assimilation by Efficacy and Flexibility

*environmental adaptation*

In every experimental condition, the environmental (assimilative) solution scored highest on response efficacy (see Table 2). On this variable, a significant effect of Tenacity emerged. Highly tenacious persons judged these assimilative strategies as more effective than less tenacious persons. Self-efficacy and Importance also had significant main effects on this response efficacy, however, these effects were both qualified by the interaction effect between Self-efficacy and Importance, as illustrated in Figure 4. This figure visualized the exact effect that was hypothesized on the choice of assimilation: response efficacy is only influenced by Self-efficacy level in the low Importance condition; in the high Importance condition, Self-efficacy does not affect response efficacy judgments. Finally, a similar interaction effect of Self-efficacy and Flexibility reached significance. This interaction is visualized in Figure 5.

*social adaptation*

Unexpectedly, the ANOVA with the response efficacy of the social adaptation rendered a strong significant main effect of Importance, indicating higher response efficacy evaluations (for identical solutions) in problems of higher importance. The main effect of Flexibility also reached significance: flexible persons judged these adaptations more positively than less flexible persons.

*personal adaptation*

The ANOVA with the response efficacy score of the personal adaptation dependent did not render any significant results. All response efficacies were evaluated equally low in both importance conditions.

**DISCUSSION**

The goal of the present study was twofold: first to investigate self-efficacy and the additional role of importance of the problem on the adaptive behavior of older people in concrete coping episodes and second to replicate the findings of a previous study, in which we studied the role of perceived self-efficacy, tenacity and flexibility. The ultimate aim was to gain more insight in the process of adaptation on the level of concrete coping scenarios and to understand better the role and interactions of various determinants in this process.

**Effects of various determinants on choice of assimilation**

In accordance with expectations, both Self-efficacy and Tenacity had a positive effect on choice of assimilation. Respondents in situations of high perceived self-efficacy selected the assimilative (environmental) adaptation more often than respondents in situations of low self-efficacy did. The same holds for tenacious versus less-tenacious respondents. In addition to these main effects, an interaction effect between Self-efficacy and Tenacity occurred. This interaction was further qualified by the 3-way interaction between these two factors (SE and T) and Flexibility (see Figure 2). The induced level of self-efficacy only significantly influenced respondents scoring high on flexibility. In situations of low self-efficacy, these respondents relinquished striving for the environmental adaptation more easily than in the high self-efficacy conditions and chose one of the alternative solutions. However, in the low flexibility condition, both main effects and the interaction effect of Self-efficacy and Tenacity were significant. This interaction implied that the effect of Tenacity was only present for low self-efficacy.

Our interpretation is that under circumstances of low self-efficacy, flexible persons are willing (able) to relinquish an unattainable goal and choose a somewhat less optimal -- note that the environmental adaptation always scored highest on response efficacy -- but attainable goal. Non-flexible persons may experience more difficulty in accepting this. The tenacious persons among them may therefore persist, in spite of perceived obstacles and choose the environmental option, while less tenacious persons perceive barriers as too high and are forced to choose an alternative strategy.

The hypothesized interaction effect of importance of the problem and self-efficacy on the choice of assimilation was not established. However, this very interaction effect was present on response efficacy. This will be discussed in the following section.

**Effects of various determinants on response efficacies**

The response efficacy scores of all three types of solutions were reported in Table 2. From this table it is clear that the environmental (assimilative) strategy was always the option that was appraised as most effective.

The interaction effect between Self-efficacy and Importance, that was hypothesized, but not found, on the choice of the assimilative strategy, was present on its response efficacy: the effect of Self-efficacy was

moderated by Importance. For important problems, with much at stake, self-efficacy regarding the environmental adaptation hardly affected evaluation of response efficacy regarding this option. On the other hand, for less important problems the exact same (environmental) coping options were evaluated lower on response efficacy in situations of low induced self-efficacy than of high self-efficacy.

This finding indicates that the expectations regarding the interaction between Importance and Self-efficacy on choice of assimilation that were formulated based on theory may have very well been correct, but that the effect has been overridden by a second process. The analysis of the response efficacy score of a second option, the social adaptive strategy, showed that this was also positively influenced by the importance of the problem, which may have distorted the effect on choice of assimilation. Importance significantly increased response efficacy evaluations of the socially directed strategy: applying for help from others seems better accepted for problems of higher importance. This at least partly explains why the interaction effect of Importance was not found on the choice variable: with increasing importance, other options also gained in attractiveness, which disturbed the pattern on the final dependent variable (choice of assimilation).

Personal dispositions also showed significant effects on response efficacy judgments. Tenacious persons judged assimilative strategies more positively than less tenacious persons, while flexible persons scored higher on response efficacy evaluations of the social strategies than less flexible persons. More tenacious persons rated assimilative adaptations as more effective than less tenacious persons and hence showed higher assimilation scores. Tenacious persons are said to be more persistent in the face of setbacks or obstacles; they are focused at solving the problem instrumentally, at attaining their goal. This goal-directedness is reflected in a preference for the assimilative solutions that is not only visible in the choice of a certain strategy, but already in the evaluation of the various options. Tenacious persons see the assimilative options as more effective than less tenacious persons do, because these strategies are goal-directed, which is in close accordance with their disposition of handling problems.

## Replication

The major part of the findings in the previous study (Slangen - de Kort, 1999) have been replicated. Again, both Self-efficacy and Tenacity showed highly significant effects on the choice of respondents coping strategies in concrete problem situations.

The interaction between self-efficacy and flexibility that was found in the previous study was not present in this experiment. The hypothesized trend of highly flexible persons switching to accommodation more easily in situations of low self-efficacy was visible, but not significant. Additional research is necessary before more conclusive statements can be made on this matter.

In contrast to the present experiment, self-efficacy did not influence response efficacy evaluations in the previous experiment. This finding however is in accordance with the present findings, since in the first study, only important problems were incorporated. The present study showed that for these important problems, the impact of self-efficacy on response evaluations is modest, in contrast to less important problems, where perceptions of low self-efficacy more easily make persons relinquish their goals and accommodate.

## In conclusion

We conclude that the role of self-efficacy in coping processes is crucial: these situation-specific, self-referent beliefs of personal competence influence adaptive behavior and the choice of adaptive strategies significantly and both directly and indirectly (via response efficacy). The direct effect, which is strongest, implies that even if a person appraises a certain adaptation as the most optimal one, this adaptation may not be adopted when this person perceives that the required efforts exceed his or her personal competence. In this case, a less optimal, alternative strategy will be embraced.

From the results of the various analyses we can conclude that both response efficacy and self-efficacy influence the choice of adaptive strategies. Importance of the problem influences the choice-process through primary and secondary appraisal and is mainly accounted for in response efficacy. When more is

at stake, people become more committed to solving the problem proactively. These findings not only apply to the technical, assimilative adaptation in our study, but to the more socially oriented, moderately assimilative, adaptation as well: asking others for help seems more acceptable in case of important problems. The conclusion that can be drawn from these analyses is that so-called 'primary appraisals' and 'secondary appraisals' are clearly interdependent: variations in the importance of the problem are reflected in evaluations of the quality of various adaptive strategies for this problem.

## Implications

We believe that the implications (and applications) of the present research should not be assessed by merely looking at the experiment itself. The question of generalizability and ecological validity should also be looked at by including the theoretical framework under investigation and the alleged underlying processes that are proposed to explain the particular phenomenon (Aarts & Dijksterhuis, 2000; see also Dawes, 1996). In other words, real life is always much more complex than any experiment can be. It goes without saying that in real life situations, many factors that have not been incorporated in the present study will play an additional role. This however does not alter the validity of the patterns that were conceptualized and tested here. It is this theoretical pattern that should generalize to the real world, not the specific findings of this experiment.

In the introduction we reported that considerable research has shown a shift with age in modes of adaptation shift from active to passive, or from assimilation to accommodation (Brandtstädter & Renner, 1990; Filion, Wister & Coblenz 1992; Wister, 1989). In the present experiment we did not investigate the relationship of this behavior with age. Results do however indicate possible explanations for these findings. Firstly we found a relation between assimilation and self-efficacy. Now although many older persons will find their autonomy challenged by physical decline at some point(s), there is much variability (both inter- and intra-individual) in patterns of aging processes: physiological aging is universal but not uniform (Fozard et al., 1992). The variability in the specific problems that we meet during our lifecycle is hence bound to increase as well. For this reason, the use of ready-to-grasp, standard solutions may very well become less frequent. Self-efficacy is often lower in new, unknown situations, in which people have no prior actual or vicarious experience. In addition, age stereotyping (negative persuasion) could also lessen perceptions of self-efficacy, especially in domains of technology. This decrease in self-efficacy may very well cause a decrease in assimilation. Secondly, Brandtstädter and Renner reported a positive relation between age and flexibility. This could provide additional explanation for the finding that older persons, in difficult situations, relinquish unattainable goals more easily than younger persons do.

The findings of this study underline the importance of perceptions of control and competence among older people. In the introduction the concept of successful aging was discussed, involving the flexible use of adaptive strategies, to optimize personal functioning and well being within the constraints of personal competence and resources (Baltes & Baltes, 1990). From this perspective we hypothesized that for problems with high importance, perceptions of barriers and complications would have a smaller negative effect on the choice of assimilation than for less important problems. When more was at stake, participants were expected to be more willing to expend effort in attaining their goals. This effect did emerge on the response efficacy judgments, but not on choice. This finding holds important implications for practice, since in real life, older persons are often confronted with problems for which assimilative solutions are difficult to realize. Often they are faced with complex procedures and scarce or ambiguous information. In these situations, perceived self-efficacy is bound to be low, especially for persons with decreasing resources and networks. Increasing self-efficacy regarding environmental modifications may very well stimulate the use of these solutions. Possible strategies that raise self-efficacy should be sought on both the problem-side, for instance in decreasing the complexity of procedures and products, and enhancing the availability and coordination of information, and on the person-side, in specific education or training in everyday problem solving processes (nothing boosts self-efficacy as much as the actual experience of control and successfully performing an activity) and the enhancement of sharing vicarious experiences of peers.

The point we are making here is not that assimilation is always the best option in a coping episode, it is however, the choice of preference in situations where central goals of the individual are at stake. In addition, a proactive attitude gives the person a sense of control, which in itself is a significant determinant of well-being, while a repeated relinquishment of control may result in an state of passivity and helplessness (Brandtstädter & Renner, 1990; Fry, 1989; Skinner, 1996).

## APPENDIX

Besides the scenario that was given in the manuscript, the following three scenarios were used in this study.

### *Scenario one:*

A 72 year-old woman, who makes dolls as a hobby has a hobby room with cabinets full of materials. However, she can no longer reach the materials that lie at the bottom of these cabinets, because she can't kneel down or bend very well. She wonders what to do now.

### *Scenario two:*

In the bathroom and kitchen of this woman, cantilever windows are the only ventilation she has available. But she can't operate them, because they are too heavy to handle that high up. She could probably manage by climbing on a chair, but she doesn't like heights and is afraid to fall down and break something, on account of her frail bones.

### *Scenario three:*

A 79 year-old man lives alone in his own house. He likes to be fairly warm, because he spends most of the day seated and hence feels cold pretty easily. The cold causes aches in his bones and muscles. Every morning he suffers from the fact that it takes such a while for the central heating to warm up his house.

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