Summary

The objective of the research in this dissertation is the development of a model of behavioral change specific for the prediction and explanation of leisure-time physical activity behavior. The new model has to be applicable as the theoretical foundation of the GALM behavioral change strategy. In this strategy, sedentary older adults aged 55–65 are stimulated to participate in leisure-time physical activities.

The research in this thesis can be subdivided into three parts. The first part (chapters 2 and 3) consists of theoretical research on leisure-time physical activity in relation to behavioral change. The second part (chapters 4, 5, 6, 7) consists of the development of instruments necessary to identify sedentary older adults and to measure the determinants of leisure-time physical activity behavior. The third part (chapters 7 and 8) consists of evaluation research into the potential validity of the new behavioral change model and a discussion of these initial results.

In chapter 1 a short introduction is given into the social and scientific relevance of the development of the behavioral change model, with a focus on the growing contribution of older adults into Dutch society, the effects of physical activity on health, and the scope of physical inactivity in Western societies, particularly in the Netherlands. With respect to the scientific relevance, the lack of theory-based stimulation strategies is mentioned and an introduction is given into research into determinants of physical activity behavior.

Chapter 2 describes the theoretical background on leisure-time physical activity and changes in leisure-time physical activity behavior. In the first part, the relationship between physical activity, fitness and health is described using the Bouchard model (also known as the Toronto model). Attention is given to the public health implications of a lack of physical activity or sedentariness. From this we can conclude that physical inactivity can be considered as high a potential risk for cardiovascular disease as are obesity, hypercholesterol, hypertension and smoking. The prevalence of physical inactivity compared to these other four lifestyle factors can be considered high. Consequently, on a societal level, a great deal of health-related improvements can still be achieved by stimulating a physically active lifestyle.

Next, the evolution of physical activity recommendations is described as to how fitness and health can be enhanced by means of regular (leisure-time) physical activity. A description is given of the 1990 and 1995 ACSM recommendations and the most recent ACSM 1998 recommendations, specific for older adults.
In the second part of chapter 2 an overview is given of determinants of leisure-time physical activity behavior and models and theories of behavioral change. Potential determinants are categorized into demographics, psychological variables, behaviors, social environment, physical environment and physical activity characteristics. Four frequently used theories and models of behavioral change are described: the theory of reasoned action/planned behavior, the health belief model, social learning/cognitive theory, and the transtheoretical model. Based on the research into the determinants and theories and models of behavioral change, we conclude within the context of the objective of this dissertation that a new model should constitute the theoretical basis of the GALM strategy, a model specifically designed for physical activity behavior which should be multidimensional (several determinants incorporated) as well as dynamic.

In Chapter 3 the GALM behavioral change model and the GALM strategy based on it are described. The GALM strategy is an evidence-based strategy. First, a description is given of the GALM strategy. This is followed by a description of the GALM behavioral change model, which is structured using insights by Chen and Baranowski. Within this model four domains can be distinguished: the implementation domain, the treatment domain, the outcome domain and the intervening mechanism domain. The intervening mechanism incorporates the four determinants/causal variables: perceived fitness, social support, self-efficacy and enjoyment. By means of an action theory and conceptual theory, the process of how the different causal variables mediate between the strategy executed and the desired outcomes of the strategy is explained.

Chapter 4 describes a short questionnaire to screen potential participants of the GALM strategy regarding their leisure-time physical activity behavior, in order to identify them as either sufficiently active or sedentary. To establish criteria for a sufficiently active lifestyle, we used the 1998 ACSM recommendation on exercise and physical activity for older adults, with a supplementary recommendation made by Mensink. The questionnaire proved to be feasible, reliable and valid.

In Chapters 5, 6 and 7 the development of new and the adaptation and translation of existing questionnaires to measure the causal variables of the behavioral change model are described. These questionnaires are necessary for the initial validation of the model.

Chapter 5 describes a questionnaire to measure self-efficacy in leisure-time physical activity. The questionnaire consists of three sub-scales: 1) self-efficacy in physical abilities, 2) self-efficacy in overcoming barriers, and 3) task self-efficacy. All three sub-scales are based on already existing English-language questionnaires. Factor analysis and correlations between the sum scores of the three scales confirmed that each scale measures a different
dimension of self-efficacy. Research into the criterion-related validity of two (1 and 2) of the three scales revealed moderate results. All three scales had a satisfactory internal consistency, which indicates that they are reliable. Stability was assessed for two (1 and 2) of the three scales with a test-retest procedure that gave satisfactory results.

Chapter 6 describes a Dutch questionnaire to measure social support for exercise behavior. The questionnaire consists of three sub-scales: 1) the Exercising Together sub-scale, 2) the Participation and Involvement sub-scale, and 3) the Rewards and Punishment sub-scale. Research into the reliability of the scale resulted in borderline sufficient scores for two (1 and 2) of the three sub-scales and in an insufficient score for one sub-scale (3). The results of this study were all lower than reported in the original study.

Chapter 7 describes the development and research into the reliability, stability and validity of a short questionnaire to measure enjoyment in leisure-time physical activity. Enjoyment is operationalized along the lines of Csikszentmihalyi's concept of flow. Research is done into reliability and validity. The results indicate that the Groningen Enjoyment Questionnaire can be considered to be reliable and valid.

In Chapter 8 the baseline measurements are presented with respect to the initial validation of the GALM behavioral change model. Scores on the potentially causal variables (self-efficacy, social support, perceived fitness and enjoyment) and the stages of change give an initial indication of the potential validity of the GALM behavioral change model. Scores on all potentially causal variables rose significantly from the pre-contemplation to the action/maintenance stages. Discriminant analysis resulted in a Canonical correlation of .58 between the pre-contemplation and the contemplation/preparation stages, and .59 between the contemplation/preparation and action/maintenance stages; 82.6% and 78.3% of the subjects, respectively, had been classified correctly. The results support the hypothesis, as described in the conceptual theory of the GALM behavioral change model.

In Chapter 9 the main results of the preceding chapters are summarized and discussed in the light of theoretical, methodological and practical implications for the development and validation of future evidence-based strategies to stimulate leisure-time physical activity behavior. With respect to theoretical issues, the criteria on the development of the new model are once again discussed in the light of the results of the initial validation of the model. With respect to methodological issues, the identification of the target group is discussed. Although identification is a major advantage, problems remain with regard to the definition of sedentariness. The disadvantages of the use of cross-sectional data and issues with respect to the measurement of the determinants and causal variables are also discussed. In
the section on future research, attention is paid to the fact that the GALM strategy, though successful, is not reaching all sedentary older adults yet. Suggestions are done for the development of individual non-structured home-based physical activity stimulation strategies, and reference is made to the PACE and SCALA strategies and the ecological approach towards sedentariness. The final section focuses on public health implications. Finally, remarks are made about the Dutch government’s growing awareness of the impact of physical inactivity on health and fitness and the problems surrounding the measurement of physical inactivity both in the Netherlands and internationally.