



## Intergoal Relations in the Context of Starting to Exercise: A Case of Positive Development from Younger to Older Adulthood

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A well-known proverb posits that old dogs do not learn new tricks. Integrating a new, effortful behavior in their daily routine, then, is not what we expect older adults to be particularly good at. In this article, we summarize evidence that, in contrast to this expectation, older people might be even better than younger adults in taking up the habit of exercising regularly. Exercising is one of the areas in life where beliefs, intentions, and behaviors often do not match. Many believe that regular exercise would be good for their health and might intend to follow their belief, but maintaining a regular exercise regimen is quite a different matter. In fact, the empirical association between exercise-related intentions and actual behavior is rather weak (Fuchs, 1997; Hagger, Chatzisarantis, & Biddle, 2002). In this article, we demonstrate that age is a possible moderator of this relationship. We posit that older people are more likely to harmoniously match regular exercise with their other goals, and that this, in turn, contributes to longer-term exercise adherence.

### The Role of Goals for Development and Health-Behavior Change

Current lifespan developmental theories acknowledge that setting and pursuing goals plays an important role in shaping one's development (e.g., Freund & Baltes, 2000). Not much, however, is known about age-related changes in goal processes (for overviews, see Freund & Riediger, 2006; Heckhausen, 1999). The little evidence that is available suggests that setting and pursuing goals may be among the domains that show positive developmental trajectories throughout adulthood rather than age-related decline (Bauer & McAdams, 2004; Sheldon & Kasser, 2001).

Engagement in health-relevant behaviors is an example where the developmental-regulatory role of the individual is particularly evident. In this article, we focus on the health-promoting behavior of starting regular physical exercise. Being physically active reduces the risk of developing cardiovascular and other diseases in all phases of the life span. Furthermore, in older adulthood, regular exercise along with other positive lifestyle habits, such as balanced nutrition, or social and intellectual involvement, can, at least temporarily, postpone or attenuate physiological decrements associated with aging (Fries, 1990; Rowe & Kahn, 1987). In stark contrast to the beneficial effects of

exercising, physical inactivity, with its attendant health risks, is highly prevalent in Western societies. Interestingly, awareness of the advantages of physical activity appears comparatively developed. In fact, numerous sedentary individuals form, at some point in time, the intention to start regular exercise. Many exercise beginners, however, quit after a few weeks or months (Wagner, 1999).

Parallel to the recent emphasis on the regulatory functions of goals in developmental psychology, health psychologists increasingly acknowledge the importance of goals for the adoption and maintenance of health behaviors (Karoly, 1990; Maes & Gebhardt, 2000; Schwarzer, 1999). Linkages between developmental and health psychology, however, are relatively rarely drawn (but see Ziegelmann, Lippke, & Schwarzer, 2006). In our research (Riediger & Freund, 2004, 2006; Riediger, Freund, & Baltes, 2005), we propose that age-related progress in setting and pursuing goals may help older adults to achieve lifestyle changes such as exercising regularly, and that the nature of relations between exercising and the individual's other goals play an important role in this development.

### Integrating the Goal of Exercising into the Individual's Goal System

People typically hold several goals at once. An exercise beginner's goal to start regular physical exercise is but one of them. Such multiple goals are often related to one another (e.g., Emmons & King, 1988; Little, 1983). Intergoal facilitation occurs when the pursuit of one goal (e.g., exercise regularly) simultaneously increases the likelihood of success in reaching another goal (e.g., lose weight). *Interference* among goals, in contrast, occurs when the pursuit of one goal (e.g., promotion at work) impairs the likelihood of success in reaching another goal (e.g., exercise regularly).

Most of the currently available research on intergoal relations was guided by an interest in potential consequences of *interference* among goals. Intergoal facilitation has received comparatively less attention. One example is the health behavior goal model (Gebhardt, 1997; Maes & Gebhardt, 2000), which conceptualizes conflict of a target health behavior (e.g., physical activity) with the person's other goals as a determinant in the process of health-behavior change. Two studies investigating physical activity (Gebhardt & Maes, 1998) and smoking cessation (McKeeman & Karoly, 1991) support the assumption that people are less successful in establishing a health behavior if it conflicts with their other goals. The study by Gebhardt and Maes, however, included only an indirect measure of goal conflict and relied exclusively on self-report. The study by McKeeman and Karoly used a more direct goal conflict measure, but applied this instrument retrospectively.

Focusing on the adoption of regular physical exercise, one of our own studies expanded this line of research by employing a developmental perspective. With the aim to implement a number of methodological improvements, we obtained *objective* information on the participants' exercise behavior, directly assessed exercise-specific intergoal conflict and facilitation, and employed a *prospective* design to investigate the potential implications of exercise-specific intergoal relations for the longer-term maintenance of regular exercise in *younger* ( $N = 99$ ,  $M = 25.1$  years) and *older*



( $N = 46$ ,  $M = 63.8$  years) exercise beginners. It is important to note that we investigated a sample of people who had taken an important step in the process of health-behavior change, namely, formed the intention to exercise regularly. We were interested in determining the degree to which success in meeting exercise goals is influenced by facilitation and interference between exercising and the individual's other goals, and in whether exercise-specific intergoal relations play a role in explaining age-related differences in longer-term exercise adherence.

We asked participants to report three important goals they had besides exercising. The extent to which the exercise goal interfered with, and facilitated the three other important goals was assessed with the Intergoal Relations Questionnaire (IRQ, Riediger & Freund, 2004). The IRQ assesses intergoal relations for pairwise constellations of goals. Interference among goals is assessed in terms of time constraints, energy constraints, financial constraints, and in terms of incompatible goal attainment strategies. Mutual facilitation among goals is assessed in terms of instrumental goal relations, and in terms of overlap of goal attainment strategies. The IRQ has demonstrated good psychometric properties and a stable structure of two unrelated factors (interference and facilitation) in several independent samples of adults of various ages (Riediger, 2007; Riediger & Freund, 2004; Riediger et al., 2005). In the research reported here, we derived indicators of exercise-specific intergoal facilitation and interference by aggregating IRQ items involving comparisons of the exercise goal with the other three goals. We also obtained, for each of the five months following the assessment of intergoal relations, objective information on the participants' exercise frequency from attendance lists and electronic attendance registration data kept by the participants' exercise facilities.

### **Intergoal Relations as Predictors of Longer-Term Exercise Adherence**

In the first three months of the study interval, exercise-specific facilitation and interference were unrelated to the participants' exercise adherence. In months 4 and 5, however, exercise-specific intergoal facilitation, but not interference, contributed significantly to the prediction of the participants' exercise frequency. Participants exercised more frequently the more exercise-specific facilitation they had initially reported (month 4: multiple  $R = .31$ ; month 5: multiple  $R = .28$ ). Furthermore, participants who continually exercised at least once a week throughout the five months of the study interval (54.2% of the sample) reported a higher level of initial exercise-specific intergoal facilitation than participants who had not exercised at all in the last two months of the study interval (16.9% of the sample; partial  $\eta^2 = .06$ ). This pattern of results was the same for younger and older participants.

A characteristic of our study was the large exercise-specific heterogeneity of the sample. Recruited in 28 different sports facilities, participants were heterogeneous with respect to exercise contexts, kinds of sport or physical activities, and previous exercise experience. An advantage of this design is that the observed effects cannot be attributed to a particular kind of sport. Limitations, however, are the potentially distorting effects of, and age-group differences in, exercise-specific characteristics. To

control for these, detailed information was obtained on each participant's reasons to exercise, exercise-specific self-efficacy, intention strength, exercise enjoyment, exercise context, and exercise biography. The predictive value of exercise-specific intergoal facilitation for longer-term exercise adherence was robust to controlling for these characteristics.

Although it is correlational, the investigation has a number of methodological characteristics that make assuming a causal relationship between intergoal facilitation and longer-term exercise adherence quite plausible: At the beginning of the study, all participants shared the goal of starting regular physical exercise. In the course of the study interval, differences in exercise behaviors evolved. Exercise-specific intergoal facilitation, assessed at the first measurement point, was predictive of these behavior variations occurring later in time. Perceiving exercising as facilitating one's other goals (and vice versa) thus appears to be among the antecedents to longer-term exercise maintenance.

We have replicated this pattern of findings with respect to goals in life domains other than starting to exercise. In various samples, we have found mutual facilitation among goals to be a reliable predictor of high involvement in longer-term goal pursuit, and interference among goals, albeit not predictive of involvement in goal pursuit, to be a reliable predictor of impairments in subjective well-being (Riediger, 2007; Riediger & Freund, 2004, 2006).

### **Age-Group Differences in Intergoal Relations and Exercise Adherence**

Older participants in our exercise study were more persistent in maintaining their desired change in life style than were younger adults. Beginning with the fourth month following the assessment of intergoal relations, older adults tended to exercise more frequently than younger adults (partial  $\eta^2 = .15$ ). Furthermore, older as compared to younger adults were significantly more likely to have exercised at least once a week throughout the entire study interval (71.1% versus 46.4%, respectively), and significantly less likely to belong to the group of exercise dropouts (i.e., to not have exercised at all during the last two months of the study interval; 4.4% versus 22.7%, respectively).

A particularly interesting question is what role intergoal relations played in the greater adherence of older adults to exercise programs. In fact, older participants reported a higher degree of exercise-specific intergoal facilitation (partial  $\eta^2 = .13$ ) than did younger participants, and mediational analyses revealed that this partly mediated their higher exercise adherence (Riediger et al., 2005). Again, these findings were robust to controlling for age-group differences in exercise-specific rival predictors, such as participant's reasons to exercise, exercise context, exercise biography and so forth.

In other words, older as compared to younger adults were more effective in realizing their goal to start and persist at regular physical exercise, in part, because exercising was more facilitative to their other important goals (and vice versa). A possible interpretation is that mutual facilitation among goals enhances goal-directed activities by allowing an efficient utilization of one's (limited) resources



in the interest of one's goals. Facilitative goals can be pursued simultaneously with little or no additional effort (see Riediger & Freund, 2004).

We have also found this pattern in goal contexts other than the initiation of an exercise program. Interestingly, the analysis of comprehensive activity diaries in one study showed that these age-group differences could not be attributed to the fact that older adults have more time available for leisure activities and are less involved in work or study than younger adults (Riediger et al., 2005). Age-related increases in motivational selectivity, however, appear to play a decisive role in this respect. In one of our studies we found that, beginning in the transition from middle to later adulthood, adults selected *fewer* goals that were more highly related to *central* life domains and that were more *similar* in contents. Moreover, focusing (in terms of selecting central and similar goals), but not restricting (the number of goals), contributed to higher facilitation among goals, which, in turn, led to stronger engagement in goal pursuit (Riediger & Freund, 2006).

Although we have not investigated this in the present sample of exercise beginners, these findings from other studies suggest that motivational selectivity in terms of focusing may be among the factors underlying the more persistent exercise adherence in older adults, by resulting in the tendency for these goals, including starting to exercise, to be mutually facilitative, which, in turn, contributes to a high involvement in goal pursuit.

### Conclusions

It seems that old dogs can learn new tricks after all. Our overall findings suggest that older adults have more mutually facilitative goals than younger adults and, to some degree as a consequence of this, might actually be better in establishing an intended change in life style such as beginning and maintaining regular exercise. Our research thus emphasizes the importance of personal goals and their interrelations for longer-term adherence to health-behavior change. The health behavior goal model (Gebhardt, 1997; Maes & Gebhardt, 2000) emphasizes the significance of *conflict* between a health behavior and the person's other goals as a determinant in health-behavior change. Considering *positive* (i.e., facilitative) intergoal relations as well, we found that facilitation is even more important than goal conflict in determining longer-term exercise adherence. This suggests that theoretical models of health behavior change would benefit from incorporating the notion of facilitative intergoal relations. Considering and strengthening facilitative relations between a target health behavior and other important goals might represent a pathway to understanding, and eventually supporting, the longer-term maintenance of health behaviors, at least after the decision to engage in such behaviors has been made.

From a developmental perspective, the study demonstrates that mutual facilitation between exercising and the individual's other goals increases throughout adulthood, at least into the transition from middle-aged to "young" old adulthood. Furthermore, our research shows that having mutually facilitative goals serves an important developmental-regulatory function in older adulthood, namely, the maintenance of high levels of active involvement in goal

pursuit despite age-associated declines in available resources. This research thus complements the evolving line of studies showing that goals may be among the phenomena that show positive adult trajectories (Bauer & McAdams, 2004; Sheldon & Kasser, 2001).

A promising research field for further investigation is to extend the search for antecedents to intergoal facilitation, such as motivational selectivity, into the domain of health-behavior change. The identification of determinants of mutual facilitation between a health behavior and other important goals of the individual could provide a first step to the development of intervention methods that would support people in realizing a desired health behavior. Such health promotion programs might be an area in which the young can learn from the older, and in which knowledge of the role that intergoal relations play in developmental regulation can be applied.

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## Healthy Living after Cancer

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Many health care professionals associate physical inactivity with cardiovascular disease, diabetes, hypertension, and high cholesterol levels. In addition, physical inactivity increases the risk of certain types of cancer such as colon and breast cancer (Friedenrich, 2001; McTiernan, Kooperberg, et al., 2003). The American Cancer Society estimates that 1/3 of all cancer deaths could be prevented by avoiding a sedentary lifestyle and obesity (McTiernan, 2006). Because exercise is an important factor in weight management and plays a role in cancer prevention, it is important to encourage adoption and maintenance of exercise as part of a healthy lifestyle.

There is a growing body of research on the physical and psychological benefits of exercise for cancer survivors. The term cancer survivor refers to individuals beginning at diagnosis and continuing through treatment and beyond. Cancer survivors participating in physical activity have shown improved cardiovascular fitness and muscle strength (Galvao & Newton, 2005; McTiernan, 2004), improved physical functioning (McTiernan, 2004; Segal, Evans, et al., 2001), decreased body fat (McTiernan, 2004; Courneya, Mackey, et al., 2003), reduced fatigue (Galvao & Newton, 2005; McTiernan, 2004), and improved overall quality of life (Courneya, 2003). Because participation in physical activity can have a positive influence on the health and quality of life of cancer survivors, it is important to encourage adoption and maintenance of physical activity among this population.

### Active for Life after Cancer

Adopting physical activity, maintaining physical activity habits and the health benefits of exercise for cancer survivors' quality of life (QOL) is the focus of research conducted by Drs. Karen Basen-Engquist and Cindy Carmack Taylor and colleagues at The University of Texas M.D. Anderson Cancer Center. To examine how exercise can benefit cancer survivors, research is conducted to examine the efficacy of physical activity programming on QOL among cancer survivors. QOL is defined from the survivor's perspective and includes elements of functional ability, emotional well-being, sexuality/intimacy, physical symptoms and social functioning (Cella, Tulskey, 1990). Psychological and emotional well-being is often compromised by cancer and associated treatment (Sellick, Crooks, 1999). Physical functioning, which refers to the ability to perform daily activities and tasks and encompasses fatigue, pain and functional ability is also frequently impacted by cancer (Kornblith, 1994).

The *Active for Life after Cancer* studies were designed to test the effect of a lifestyle physical activity (LPA) intervention on the quality of life of sedentary prostate and breast