

**Social Resources and Risk Factors for  
Autonomy and Quality of Life  
despite Multimorbidity**

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## Abstract

As life expectancy increases, the accumulation of diseases becomes more likely and may result in multimorbidity – the co-occurrence of two or more chronic conditions at a time. Being multimorbid bears several difficulties, such as more frequent health care utilisation, longer hospital stays, complications with treatment and a greater likelihood of developing disabilities and mobility impairments. These problems can cause rapid declines in quality of life and autonomy for those affected. One option to restore quality of life and autonomy despite having several health complaints is to rely on one’s social network to assist with staying mobile as well as with daily chores and activities that are no longer possible without external help. However, accepting help does not always happen without costs for the recipient. Some older adults fear that they will become a burden to their care-givers. Moreover, research indicates that older adults and those with chronic conditions may perceive support as a threat to their self-esteem, and develop feelings of dependence, guilt, depressive symptoms, and experience social conflict. Therefore, receiving support was referred to as a “double edged sword” or “mixed blessing”.

This dissertation begins by reviewing the literature on the effects of several distinct social support constructs on quality of life, autonomy and health behaviours in older adults with multiple chronic illnesses. The following empirical chapters then systematically test theories that may explain negative effects of receiving support. Thereby, high specificity in the assessment of social resources and risk factors will be emphasised to elaborate on the particular types and circumstances that render receiving support beneficial for quality of life and autonomy. Finally, the general discussion elaborates on strategies for future research and practice that aim at facilitating a life with high autonomy and quality of life despite multimorbidity.

## Zusammenfassung

### **Soziale Ressourcen und Risikofaktoren für Autonomie und Lebensqualität trotz Multimorbidität**

Soziale Unterstützung aus dem sozialen Netzwerk eines chronisch erkrankten Menschen kann zu mehr Mobilität, einem besseren Umgang mit der Krankheit und zu einem gesünderen Lebensstil verhelfen (Uchino, 2009). Interaktionen mit anderen Menschen rufen jedoch nicht, wie lange in der Erforschung sozialer Unterstützung angenommen, nur positive Effekte für das Wohlbefinden älterer und chronisch erkrankter Menschen hervor. Sie können unter Umständen das Gegenteil bewirken, indem sie die Selbstbestimmtheit einschränken, Konflikte oder Reaktanz hervorrufen, oder den Selbstwert der Hilfe empfangenden Person mindern können (Taylor, 2007). Diese Arbeit leistet einen Beitrag zur Erforschung der Kehrseiten sozialer Unterstützung im Alter und entwickelt Strategien diese zu vermeiden.

Menschen mit mehreren chronischen Erkrankungen – der so genannten Multimorbidität – sind besonders auf die Hilfe aus ihrer Umwelt angewiesen, da sie mit höherer Wahrscheinlichkeit gebrechlich und pflegebedürftig werden. Daher nehmen sie in besonderem Ausmaß soziale Unterstützung in Anspruch (Marengoni, Von Strauss, Rizzuto, Winblad, & Fratiglioni, 2009). Allerdings kann zu viel oder ungünstig interpretierte soziale Unterstützung bei Menschen mit Mehrfacherkrankungen dazu führen, dass sie sich in ihrer Autonomie eingeschränkt fühlen (Tooth, Hockey, Byles, & Dobson, 2008).

Ziel dieser Arbeit ist es daher, zu untersuchen, welche sozialen Unterstützungsversuche von multimorbid erkrankten älteren Menschen wirklich als Unterstützung – also als Ressourcen – und welche Unterstützungsversuche als Beeinträchtigungen ihrer Gesundheitsverhaltensweisen, ihrer Lebensqualität und ihrer Autonomie – also als Risikofaktoren – wahrgenommen werden. Insbesondere untersucht die Arbeit die Ursachen und Umstände für negative Auswirkungen sozialer Unterstützung. Im Ausblick werden Strategien erarbeitet, wie soziale Unterstützung von älteren Menschen mit multiplen Erkrankungen besser akzeptiert und wie negative Auswirkungen vermieden werden können. Solche Strategien sollen der Abwärtsspirale der Lebensqualität und Autonomie bei Menschen mit Mehrfacherkrankungen entgegenwirken, ein selbstbestimmtes Leben erleichtern und Pflegebedürftigkeit hinauszögern oder mindern.

Um Forschungsergebnisse zu sozialen Unterstützungsprozessen hinreichend interpretieren zu können, sollte eine differenzierte Perspektive auf die unterschiedlichen Formen der sozialen Unterstützung eingenommen werden. Daher unterscheidet diese Arbeit zwischen *erhaltener* sozialer

Unterstützung, also der retrospektiv berichteten Unterstützung aus Sicht des Empfängers, und *erwarteter* Unterstützung, die eine Zielperson glaubt zu bekommen, wenn eine Situation es erforderlich macht (Berkman & Glass, 2000). Zudem wird bei der Erforschung sozialer Interaktionen unterschieden, wie viel Unterstützung von der Zielperson *geleistet* wurde und in welchem Ausmaß *soziale Konflikte* auftreten. Weiterhin differenziert die Arbeit drei Arten der sozialen Unterstützung: a) *emotionale* Unterstützung (von anderen getröstet oder aufgeheitert werden), b) *informationelle* Unterstützung (Informationen oder Ratschläge erhalten) und c) *instrumentelle* Unterstützung (Erhalt von materiellen Gütern oder zeitlichen Ressourcen). Zudem kann soziale Unterstützung allgemein erhoben werden, z.B. als generelle Aufmunterung, oder spezifisch, wie etwa Unterstützung zum Umgang mit einer bestimmten Krankheit oder zum Aufbau eines gesunden Lebensstils.

Während soziale Unterstützung zu *erwarten* und zu *leisten* sich als konstant positiv für das Wohlergehen älterer und chronisch erkrankter Menschen herausgestellt haben (Brummett, et al., 2005; Schwartz & Sendor, 1999), berichtet die Forschung zur *erhaltenen* Unterstützung immer wieder inkonsistente Befunde. So finden manche Studien, dass erhaltene Unterstützung das Risiko für depressive Symptome senkt, die Lebensqualität nach Operationen erhöht und das Selbstmanagement bei chronischen Krankheiten fördert (DiMatteo, 2004; Schröder, 1997). Andere Studien berichten keine Effekte erhaltener Unterstützung (Schreurs, De Ridder, & Bensing, 2000; Seeman, Bruce, & McAvay, 1996), und wieder andere Studien berichten, dass erhaltene Unterstützung bei chronisch Erkrankten Gefühle der Hilflosigkeit, depressive Symptome und körperliche Einschränkungen hervorruft und verstärkt (Bisschop, Kriegsman, Beekman, & Deeg, 2004; Von Bergen, Soper, Rosenthal, Cox, & Fullerton, 1999).

Vor dem Hintergrund der inkonsistenten Befundlage zur Auswirkung erhaltener sozialer Unterstützung widmet sich diese Arbeit daher folgenden übergeordneten Fragen:

- 1) Ist erhaltene soziale Unterstützung eine Ressource oder ein Risikofaktor für Gesundheitsverhalten, Lebensqualität und Autonomieempfinden älterer mehrfach erkrankter Menschen?
- 2) Unter welchen Umständen ist erhaltene Unterstützung ein Risikofaktor? Können Unterschiede im Studiendesign (Kapitel 3, 6) oder in der Messung des Konstrukts (Kapitel 4, 5, 6) die negativen Effekte erklären? Oder ist das Zusammenspiel erhaltener Unterstützung mit Selbstwert (Kapitel 2), Selbstwirksamkeit (Kapitel 2, 3, 4, 5) oder sozialem Konflikt (Kapitel 6) dafür verantwortlich?

- 3) Unter welchen Umständen ist erhaltene Unterstützung eine Ressource? Wirkt erhaltene Unterstützung grundsätzlich unterschiedlich auf verschiedene abhängige Variablen, wie Gesundheitsverhaltensweisen, Lebensqualität und Autonomie (Kapitel 4, 5, 6)? Und welche Art der sozialen Unterstützung wird von wem positiv bewertet (Kapitel 3, 4, 5, 6)?

Diese Fragen und ihnen zu Grunde liegende Theorien zur Erklärung der negativen Effekte erhaltener sozialer Unterstützung wurden in dieser Arbeit systematisch in den empirischen Kapiteln 2 bis 6 an zwei Stichproben bestehend aus Menschen des mittleren und höheren Lebensalters mit Mehrfacherkrankung untersucht.

Kapitel 1 widmete sich der Frage, wie allgemein erfasste *erhaltene* im Vergleich zu *erwarteter* und *geleisteter* emotionaler sozialer Unterstützung auf körperliche und mentale Lebensqualität multimorbid erkrankter Menschen wirkt. Außerdem wurde untersucht, welche psychologischen Mechanismen den Zusammenhang zwischen *erhaltener*, *erwarteter* und *geleisteter* Unterstützung und Lebensqualität erklären können, indem Selbstwert und Kontrollüberzeugungen als simultane Mediatoren getestet wurden. Kontrollüberzeugungen sind Annahmen eines Individuums, Ereignisse durch das eigene Verhalten herbeiführen oder beeinflussen zu können und damit essentiell für die Eigenständigkeit und Lebensqualität im Alter (Rodin, 1986). *Erwartete* und *geleistete* Unterstützung war, wie angenommen, förderlich für die Lebensqualität. Zudem ließen sich die Effekte durch eine Verbesserung des Selbstwerts und der Kontrollüberzeugungen erklären.

Nur der *Erhalt* von Unterstützung zeigte sich in Kapitel 2 nachteilig für die Lebensqualität mehrfach erkrankter Personen. Da dieser negative Effekt erhaltener Unterstützung jedoch nicht über eine Verminderung der Kontrollüberzeugungen und des Selbstwerts vermittelt wurde, konnten weder die *Social Breakdown* noch die *Failed Individual Coping* Theorie bestätigt werden (Bengtson & Kuypers, 1985; Wethington & Kessler, 1986). Auch konnte auf Grund des querschnittlichen Designs von Kapitel 2 die *Mobilisierungshypothese* nicht widerlegt werden. Diese besagt nämlich, dass erhaltene soziale Unterstützung nicht an sich negative Effekte hervorruft, sondern die negativen Effekte durch Stressoren (wie z.B. der Beginn einer Erkrankung oder der Verlust des Partners) verursacht werden, die als Konsequenz vermehrt soziale Unterstützung auftreten lassen (Barrera, 1986). Aus diesem Grund wurden in den Folgestudien dieser Arbeit alternative Erklärungsansätze im Längsschnitt untersucht.

In Kapitel 3 wurde Selbstwirksamkeit (eine Form der Kontrollüberzeugung) als Moderator in der Beziehung zwischen allgemeiner erhaltener instrumenteller Unterstützung und Autonomie untersucht. Autonomie wurde hierbei als das subjektive Empfinden von Entscheidungs- und

Handlungsspielräumen erfasst (Schwarzer, 2008). Der längsschnittliche Zusammenhang zwischen erhaltener Unterstützung und Autonomie wurde erst durch die Einführung von Selbstwirksamkeit als Moderator ersichtlich: Entsprechend der *Kompensationshypothese* konnten Menschen mit niedriger Selbstwirksamkeit ihre Autonomie aufrechterhalten, indem sie das Fehlen an Selbstwirksamkeit durch den Erhalt von sozialer Unterstützung kompensieren (Schröder, 1997). Menschen mit hoher Selbstwirksamkeit hingegen nahmen mit steigender sozialer Unterstützung zunehmend Einschränkungen ihrer Autonomie wahr, was die *Interferenzhypothese* bestätigte (Schröder, 1997). Nur solche mehrfach erkrankten Personen, die schon starke Einbußen ihrer personalen Ressourcen erlitten haben, scheinen demnach ihr Autonomieerleben durch externe Hilfe aufrechterhalten zu können, d.h. nur sie profitieren von so genannter *selektiver selbstbestimmter Abhängigkeit* (Bandura, 1997).

Im nächsten Schritt der Arbeit sollten über die *psychologischen Mechanismen* hinaus *behaviorale Prozesse*, die durch den Erhalt von sozialer Unterstützung ausgelöst werden können, untersucht werden. In den Kapiteln 4 bis 6 wurde daher die Beziehung von erhaltener sozialer Unterstützung mit zwei essentiellen Gesundheitsverhaltensweisen für ältere Menschen mit chronischen Erkrankungen analysiert – körperliche Bewegung und regelmäßige Einnahme verschriebener Medikamente, auch Medikamentenadhärenz genannt.

In Kapitel 4 wurde untersucht, wie bewegungsspezifisch erfasste Selbstwirksamkeit und bewegungsspezifisch erfasste soziale Unterstützung auf die Bewegungshäufigkeit älterer mehrfach erkrankter Menschen wirken. Im Gegensatz zu Kapitel 3, aber in Einklang mit früheren Studien zur körperlichen Aktivität (Dishman, Saunders, Motl, Dowda, & Pate, 2009), ergaben die Ergebnisse aus Kapitel 4 einen additiven und keinen kompensatorischen oder interferierenden Effekt beider Ressourcen auf Bewegungsverhalten: Diejenigen Personen, die sich am häufigsten körperlich bewegten, berichteten hohe Maße an sozialer Unterstützung *und* hohe Selbstwirksamkeitsüberzeugungen, regelmäßig körperlich aktiv sein zu können. Erhaltene Unterstützung hatte in Kapitel 4 also einen positiven Effekt.

Da sich bewegungsspezifische Selbstwirksamkeit als besonders wichtige Ressource für das Bewegungsverhalten älterer Menschen erwiesen hat, wurde in Kapitel 5 analysiert, ob soziale Ressourcen für den Aufbau von Selbstwirksamkeit genutzt werden. Es zeigte sich, dass ältere mehrfach erkrankte Menschen tatsächlich davon profitieren, einen oder mehrere Sportpartner zu haben, die als Verhaltensmodelle fungieren. Dahingegen hingen Überredungsversuche weder mit der Selbstwirksamkeit noch mit dem Bewegungsverhalten positiv zusammen. Beide Ergebnisse stehen

in Einklang mit der *Selbstwirksamkeitstheorie* von Bandura (1997) und einer kürzlich erschienen Meta-Analyse (Ashford, Edmunds, & French, 2010), die berichtet, dass soziale Einflüsse die Selbstwirksamkeit für körperliche Aktivität beeinflussen können, indem sie Verhaltensmodelle bereitstellen, nicht aber durch verbale Überzeugungsversuche.

Da sich die Frage stellt, weshalb die ersten beiden Studien dieser Arbeit zu negativen und die nächsten beiden hauptsächlich zu positiven Effekten erhaltener sozialer Unterstützung kamen, lag die Erklärung nahe, dass Maße der erhaltenen sozialen Unterstützung, die passend zur abhängigen Variable erhoben werden (sich z.B. beide auf ein bestimmtes Gesundheitsverhalten beziehen), eher positive Effekte hervorbringen als allgemeiner erfasste Unterstützungsmaße. Folglich wurden in Kapitel 6 die Auswirkungen *allgemeiner* und *verhaltensspezifisch erfasster erhaltener* sozialer Unterstützung auf ein weiteres Gesundheitsverhalten, Medikamentenadhärenz, untersucht. Während das allgemeine Unterstützungsmaß nicht mit Medikamentenadhärenz zusammenhing, berichteten Personen bei vermehrter medikamentenspezifischer Unterstützung abnehmende Medikamentenadhärenz, sowohl querschnittlich als auch längsschnittlich. Dieser längsschnittlich gefundene negative Zusammenhang schließt die Mobilisierungshypothese als Erklärung aus, da diese annimmt, dass negative Zusammenhänge zwischen erhaltener Unterstützung und abhängigen Variablen ausschließlich querschnittlich auftreten. Deswegen überprüfte Kapitel 6 als weiteren Erklärungsansatz für die negativen Effekte erhaltener Unterstützung eine Interaktion mit *sozialem Konflikt* (Abbey, Abramis, & Caplan, 1985). Mit sozialem Konflikt sind dabei negative soziale Interaktionen wie Kritik, Zurückweisung, oder Missbilligung gemeint. Tatsächlich ließ sich der negative Effekt erhaltener medikamentenspezifischer Unterstützung auf diejenigen Personen zurückführen, die gleichzeitig viele soziale Konflikte berichteten.

Die abschließende Diskussion dieser Arbeit in Kapitel 7 kommt daher zu dem Schluss, dass die negativen Effekte erhaltener sozialer Unterstützung nicht auf Inkongruenzen in der Messung sozialer Unterstützung und der abhängigen Variable oder auf die Mobilisierungshypothese zurückzuführen sind, sondern reale Hindernisse für die Lebensqualität und Autonomie im Alter darstellen. Diese Arbeit zeigt somit, dass negative oder Null-Effekte erhaltener sozialer Unterstützung durch ihr Zusammenspiel mit personalen Ressourcen und sozialem Konflikt erklärt werden können. Zukünftige Forschung zu sozialen Ressourcen sollte daher versuchen, diese Variablen ebenfalls zu erheben.

Um in der Praxis negative Effekte durch gut gemeinte soziale Unterstützung zu vermeiden, können folgende Strategien aus dieser Arbeit abgeleitet werden: Auch ältere und chronisch

erkrankte Personen profitieren davon, die erfahrene Unterstützung in moderatem Ausmaß zu erwidern, da Hilfeleistungen sich positiv auf ihren Selbstwert und ihre Kontrollüberzeugungen und damit auf ihre Autonomie und Lebensqualität auswirken (Schwartz & Sendor, 1999). Vor allem aber sollte soziale Unterstützung auf das Ausgangsniveau an personalen Ressourcen älterer Menschen mit Mehrfacherkrankungen angepasst sein. Personen, die sich trotz ihres Gesundheitszustandes noch viel zutrauen, sollten daher aktiv in den Entscheidungsprozess über Hilfeleistungen einbezogen werden, da sonst die Gefahr besteht, dass externe Hilfe als Überbehütung oder Kontrolle wahrgenommen wird, was zu Einschränkungen des Autonomieerlebens und zu Konflikten führen kann. Als zuträglich hat sich das Konzept der *autonomieunterstützenden* Hilfe erwiesen, welches chronisch erkrankten Menschen Entscheidungsspielräume und Mitspracherecht einräumt, und lediglich geringen Druck in Richtung vorgegebener Verhaltensweisen ausübt (Williams, Rodin, Ryan, Grolnick, & Deci, 1998). Die Strategie der autonomieunterstützenden Hilfe sollte daher Eingang in die informelle und professionelle Versorgung älterer Menschen mit Mehrfacherkrankungen finden.

# 1

## Introduction

## Introduction

The American comedian George Burns once said “Happiness is having a large, loving, caring, close-knit family in another city”. Most would not disagree with that statement and some might also extend this notion to relationships outside the family. In other words, social relations are a coin that has a huge positive side, but sometimes also reveals its negative side. An individual’s perception of social relations also develops throughout the life span (Antonucci & Akiyama, 1987; Carstensen, 1992). Research indicates that older adults and persons with chronic illnesses experience many life events that have a significant impact on their social networks and perceptions of help (e.g., M. M. Baltes & Silverberg, 1994). For example, their social networks may shrink due to retirement or bereavement, and their ability to participate in social activities may fade, because of disability or lack of mobility (M. M. Baltes & Silverberg, 1994).

Yet, those social network members, who remain, are an important source of social support and provide older adults with opportunities to maintain autonomy and quality of life despite growing health issues (Tooth, Hockey, Byles, & Dobson, 2008). Despite the advantages of having social support, being helped often results in older adults feeling dependent and may evoke tensions in those individuals, who strive to live their lives independently (S. Cohen & Janicki-Deverts, 2009; Reich & Zautra, 1995; Rook & Schuster, 1996).

Therefore, the goal of this thesis is to examine what kind of help older adults with multiple chronic illnesses perceive as helpful in maintaining autonomy and quality of life, and under which circumstances they may react negatively to being helped. The five empirical chapters of this thesis therefore distinguish between different kinds of potential social resources and risk factors – anticipating support, providing support, receiving support, social conflict. This thesis puts a special emphasis on *receiving* social support, because previous research has produced inconclusive results. More specifically, some studies report that receiving support facilitates coping and adjustment to illnesses (Schwarzer & Knoll, 2007). However, other studies found that receiving support can negatively affect quality of life and autonomy in persons with chronic illnesses (Newsom & Schulz, 1998; Reich & Zautra, 1995; Smith & Goodnow, 1999). In the general discussion section, the thesis’ findings will be integrated into the social support literature in order to elaborate strategies on how social network members and professional care-assistants can provide social support in such a way that it becomes easier for older adults to accept help and that supports their striving for autonomy and quality of life despite multimorbidity.

*The Conceptualisation of Social Resources*

Since the very beginning of social support research, researchers were fascinated by the fact that people live longer when they have social contact with others (House, Landis, & Umberson, 1988). In addition, social ties can help individuals stay healthy and reduce physical symptoms during illnesses (S. Cohen, Doyle, Skoner, Rabin, & Gwaltney, 1997; A. C. de Vries, Craft, Glasper, Neigh, & Alexander, 2007; Shin & Kolanowski, 2009). Moreover, social ties help us with recovery from critical life events such as trauma, unemployment, chronic diseases or the loss of loved ones (Benight & Bandura, 2004; Kriegsman, Penninx, & van Eijk, 1995; Martire, Lustig, Schulz, Miller, & Helgeson, 2004; Silverstein & Bengtson, 1994; Vinokur & Van Ryn, 1993); and they can help to actively engage in health and self-management behaviours (Gallant, 2003; Park & Gaffey, 2007). The link between social relations and mortality, coping with and recovery from illnesses makes social support an important topic for research on aging. Understanding these relationships may open up new ways to help aging adults so that they are able to maintain high quality of life and autonomy despite their worsening health status.

*The Structural and Functional Aspects of Social Support*

What was assumed to be a stable positive link between social relations and health outcomes in the early stages of social support research (Berkman & Syme, 1979; House, et al., 1988), revealed more heterogeneous effects over the following decades (Schwarzer & Leppin, 1991). One of the first prospective studies on social relations and mortality reported that being married and having frequent contact with friends and relatives increases longevity (Berkman & Syme, 1979). This effect was stable even when the impact of other risk factors, such as self-reported health status, socioeconomic status, race and health practices (e.g., smoking, alcoholic beverage consumption, obesity, physical activity, utilisation of preventive health services) were controlled for (Berkman & Syme, 1979). More recent studies, however, report that receiving support may increase the risk of functional decline in aging adults and those with chronic illnesses (Hays, Saunders, Flint, Kaplan, & Blazer, 1997; Mendes de Leon, Gold, Glass, Kaplan, & George, 2001) and even enhance mortality (Brown, Nesse, Vinokur, & Smith, 2003). These mixed results evolved around the various different possibilities to conceptualise social resources and their corresponding assessment methods (Uchino, Cacioppo, & Kiecolt-Glaser, 1996). The first studies on social support were mostly interested in *structural measures* of social support, such as *social integration* or *embeddedness*. More specifically, researcher assessed the numbers of close friends and relatives, marital status or the membership in religious and voluntary associations (Berkman & Glass, 2000).

In contrast to the structural operationalisation of social support, more recent research mainly investigated the *functional aspects* of social support; such as actual supportive interactions taking place within social networks, and constituting the link between social embeddedness and health outcomes (Berkman & Glass, 2000). Consequently, the term *social support* is a meta-construct (Vaux, Riedel, & Stewart, 1987), incorporating a *quantitative structural side*, e.g., networks size, marital status or the frequency of contact, and a *qualitative functional side*, e.g., perceived availability of support, and actually received support or satisfaction with support (Finch, Okun, Barrera, Zautra, & Reich, 1989; Schwarzer & Leppin, 1991).

#### *Pathways that Lead from Functional Aspects of Social Support to Health Outcomes*

Social support researchers agree that functional aspects of social support are more closely related to health outcomes and mortality than structural aspects. The link between functional social support measures and health outcomes is assumed to be mediated via three major pathways (Berkman & Glass, 2000):

- 1) The *psychological pathway* – acting through cognitions and feelings about oneself, such as self-efficacy, self-esteem or depression. Being supported may foster individual's beliefs in being able to try out new activities and accomplish goals (Schwarzer & Leppin, 1991). Older adults may, however, also view external help as a message that they are no longer able to do things by themselves, which might provoke feelings of dependence and depression (Roe, Whattam, Young, & Dimond, 2001; Wortman & Conway, 1985).
- 2) The *physiological pathway* – affecting physiological parameters, such as the immune or cardiovascular system. Being supported in a stressful situation may, for example, decrease the heart rate and diminish the release of stress hormones (S. Cohen, 2004). However, it may, also put the person under pressure, because of the support provider's expectancies (Thorsteinsson & James, 1999).
- 3) The *behavioural pathway* – operating via health behaviours, such as exercise or medication adherence. An individual may, for example, profit in terms of exercise frequency from having a sports-partner, but disapprove of constant reminders to exercise (Ashford, Edmunds, & French, 2010).

This thesis lays its emphasis on the *psychological* and *behavioural pathway* linking social support to health and well-being as these are especially important for older adults and adults with chronic conditions. As physiological parameters are already heavily affected in older adults with multiple chronic conditions, this pathway will not be investigated within this thesis.

Figure 1 depicts how social networks build the foundation for functional aspects of social support, and the three pathways that link functional support with health outcomes.

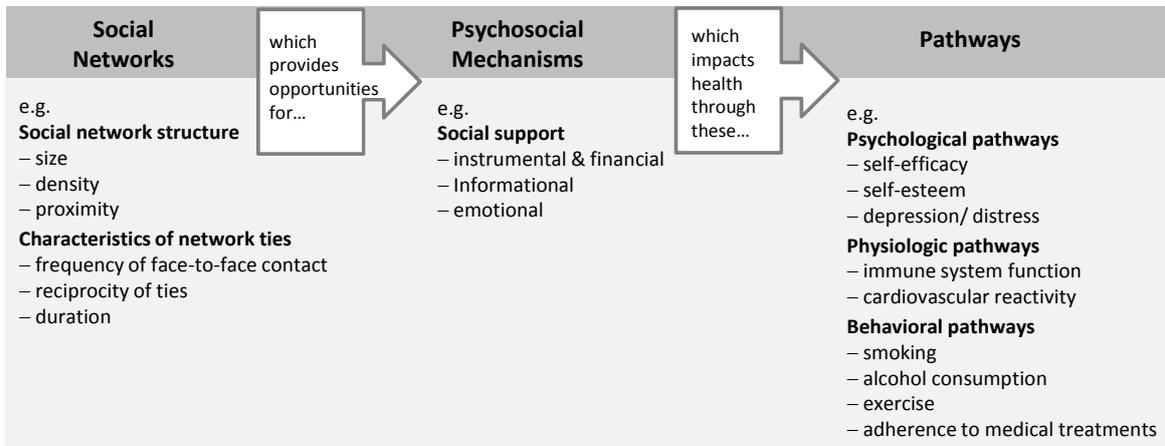


Figure 1. Conceptual model adapted from Berkman and Glass (2000)

Within the category of *functional* support, it showed to be useful to further distinguish between the following three facets of support, as they have distinct effects on individual's health and well-being (Brown, et al., 2003; Helgeson, 1993):

- 1) *Providing* support: Self-reports of the provider on support provided to others in the past. A typical statement to assess provided emotional support may be “How often have you cheered up or consoled someone else in the last 12 months?” (Warner, Schüz, Wurm, Ziegelmann, & Tesch-Römer, 2010).
- 2) *Anticipating* (or *perceiving*) support: Self-reports on support that is perceived to be available if needed. Measures of anticipated emotional support usually ask participants to rate items like “Whenever I am sad, there are people who cheer me up.” (Schwarzer & Schulz, 2000).
- 3) *Received* (or *enacted*) support: Self-reports of the recipient on emotional support that was received in the past that are reflected by statements such as “How often have you been consoled or cheered up in the last 12 months?” (Warner, et al., 2010).

#### *Providing Support*

Traditionally providing support to others was viewed to be resource-consuming for the provider (Kessler, McLeod, & Wethington, 1985). However, recent research suggests that providing reasonable amounts of support is not detrimental but beneficial for mental and physical health and even longevity in older, retired and also chronically ill individuals (e.g., Brown, 2007; Brown, et al., 2003). This effect, called the *Helper Therapy Principle* (Riessman, 1965), is assumed to primarily affect outcomes via the psychological pathway, as it provides opportunities to feel independent and reduces feelings of indebtedness, anxiety and depression (Gleason, Iida, Bolger, &

Shrout, 2003). Providing support was further found to promote feelings of personal control (Krause, Herzog, & Baker, 1992) and self-esteem (Krause & Shaw, 2000). Hence, even individuals with limited resources may experience to be an active agent and give meaning to their lives by providing support to others (Midlarsky, 1991).

### *Anticipating Support*

The most commonly assessed aspects of social support in samples of older adults and those with chronic illnesses is anticipated support (Gallant, 2003). Anticipated support is a general positive outlook in life and a relatively stable individual characteristic (Chen, Gully, Whiteman, & Kilcullen, 2000; Sarason, Levine, Basham, & Sarason, 1983). In addition, it is positively related to coping with illnesses, disease self-management, quality of life, low levels of depression and mortality both in persons with and without illnesses (Brummett, et al., 2005; Filazoglu & Griva, 2008; Finch, Okun, Pool, & Ruehlman, 1999; Gallant, 2003; Roberts, Lepore, & Helgeson, 2006). The underlying psychological mechanisms for the positive effects of anticipating support is assumed to be the awareness of potentially helpful others, which builds a kind of safety net that encourages people to act on their own (Wethington & Kessler, 1986). Anticipated support has been shown to be closely linked to self-referent cognitions such as self-esteem or self-efficacy and to personality factors such as conscientiousness, agreeableness, extraversion and social skills (Finch, et al., 1999; Lakey & Cohen, 2007; Lakey & Scoboria, 2005; Sarason, et al., 1983). Therefore, the early assumption that received support is the basis for perceptions of support (Wethington & Kessler, 1986) was abandoned over time. Today, the two constructs are seen as relatively independent (Lakey & Cohen, 2007), whereby anticipated support relates strongly to characteristics of the reporting individual, its early attachment experiences in life and its relation to the provider (Brand, Lakey, & Berman, 1995).

In sum, anticipated support is, to a great extent, formed by individual's perceptions, judgments and memory biases. Recent evidence showed that measures of perceived support rely less on objectively appraised supportive actions than measures of received support (J. L. Cohen, Lakey, Tiell, & Neeley, 2005). Consequently, perceived support is a relatively stable construct, which is not very responsive to change in the reporting person's life (Abbey, Abramis, & Caplan, 1985). However, older and chronically ill persons are often reliant on actual support from others and may, at times, have to deal with help imposed on them (Reich & Zautra, 1995). Therefore, this thesis' mainly focuses on the effects of *receiving* help for older adults with multiple chronic illnesses, to reveal potential for improvements in actually occurring recipient-provider interactions.

### *Received Social Support*

In contrast to the positive effects of anticipated and providing support, previous research on *received* support has not resulted in such a clear picture. Besides reports on positive effects of receiving help (DiMatteo, 2004; Penninx, Van Tilburg, Deeg, & Kriegsman, 1997; Schwarzer & Knoll, 2007), others find no relationship (Schreurs, De Ridder, & Bensing, 2000; Seeman, Bruce, & McAvay, 1996), while a growing number of studies have shown a negative association between received support and older adult's health, well-being and health behaviours (Brown, et al., 2003; E. Fisher, La Greca, Greco, Arfken, & Schneiderman, 1997; Hays, et al., 1997; Newsom & Schulz, 1998; Schwarzer & Leppin, 1991). This disparate role of received support makes further investigations on the reasons and circumstances under which it may be harmful especially important.

### *Mobilisation Hypothesis*

There are several possible explanations for such adverse effects of receiving social support for the recipient: One explanation is that individuals, who are faced with a stressor, such as the onset of chronic diseases, receive more help as a consequence. This explanation is known as the *mobilisation hypothesis*. It states that adverse events evoke and mobilise support, which can explain cross-sectional negative associations between receiving support and outcomes. Longitudinally, however, received support is assumed to have positive effects on health outcomes (Barrera, 1986; Schwarzer & Leppin, 1991; Väänänen, Vahtera, Pentti, & Kivimäki, 2005). Consequently, negative effects of receiving support should only occur in cross-sectional analyses according to the mobilisation hypothesis, even though previous research has found adverse effects of receiving support also in longitudinal designs (Brown, et al., 2003; Schwarzer & Leppin, 1991). Therefore, this thesis investigates the mobilisation hypothesis using cross-sectional, longitudinal and cross-lagged panel analyses in Chapter 2, 3 and 6. In addition, mere spuriousness effects could not account for these negative findings over time (Seidman, Shrout, & Bolger, 2006). With that said, it is not likely that the mobilisation hypothesis sufficiently explains the adverse effects of receiving help (Seidman, et al., 2006). Hence, other explanations for this phenomenon need to be investigated (Brown et al. 2003).

### *Matching Hypothesis*

One of these explanations draws on the fact that the aged and the chronically ill often face social support, which they have not asked for and which feels as if it is imposed on them (Reich & Zautra, 1995; Smith & Goodnow, 1999; Zautra, Reich, & Newsom, 1995). According to several authors such "unwanted" support harms the recipient even if it is well-intended, as receiving

support is assumed to be beneficial only at times when the person needs help, is receptive to it, or requested to be supported (Bolger & Amarel, 2007; Gallant, 2003; Revenson, 1990). Along this line, the *matching hypothesis* goes even further to say that not only the timing and appropriateness is of importance, but rather the type of support that is provided (Cutrona, 1990). For example, received social support for a particular health behaviour is assumed to be more predictive and positively related to the performance of that specific behaviour (H. De Vries, Kremers, Smeets, & Reubsaet, 2008; Eyster & Brownson, 1999; Thrasher, Campbell, & Oates, 2004). The matching hypothesis predicts that support that does not match the needs of the recipient will be less effective and may at times be detrimental (Cutrona, 1990; Horowitz, et al., 2001). According to Revenson (1990), these kinds of mismatches in supportive interactions may be due to a lack of communication in older adults and their social interaction partners.

Such mismatches might occur as well, when the *assessment* of received support does not correspond with the study outcome (Thrasher, et al., 2004). This points to another possible methodological explanation as to why received support is sometimes detrimental, yet perceived support consistently showed positive effect: The concept of perceived support suggests that support matches the specific circumstances, whereas received support can either not match the needs or it could have been *assessed* as mismatching to the needs of the recipient.

To sum up, on the one hand support may occur that was not sought out and does not match the requirements of the recipients, due to actual social interactions, or a mismatch in the assessment of support and outcome. However, on the other hand, these theories do not yet provide answers on the mechanisms that are responsible for the translation of well-intentioned social support to adverse effects on health and well-being for the recipient. These mechanisms have been addressed in further theories.

#### *Equity Theories*

*Equity theories*, such as reciprocity and indebtedness theory (Greenberg, 1980; Walster, Walster, & Berscheid, 1978), predict that receiving more than providing support causes feelings of guilt, indebtedness and a sense of being a burden to others. Since older adults are limited in their ability to reciprocate support, they are deemed to be episodically at risk to develop negative emotions and inequity in providing and receiving support (Hogan, Linden, & Najarian, 2002; Newsom & Schulz, 1998). Negative emotions, in turn, are thought to explain the detrimental effects of receiving support on health and well-being.

However, it has been found that the need for immediate reciprocity is diminished in relationships that provide opportunities to return the favour in the future (J. D. Fisher, Nadler, & Witcher-Alagna, 1982). Because older adult's networks mostly consist of long lasting relationships that provide future opportunities to reciprocate support, immediate reciprocity does not need to be established (Carstensen, 1992).

#### *Convoy Model*

Equity theories are further attenuated by Antonucci's concept of reciprocity throughout the life-span (Antonucci & Akiyama, 1987). This *convoy model* assumes that individuals travel through their lives surrounded by stable convoys of social network members who are willing to reciprocate support (Antonucci & Akiyama, 1987). This theory predicts that receiving support in older ages is not problematic as older recipients simply receive back a similar amount of support that they provided to others earlier in their relationships. Hence, a time-lagged reciprocity is established, which would not give reason to develop feelings of guilt or indebtedness (Antonucci and Akiyama 1987).

#### *Social Breakdown and Failed Individual Coping Theory - Personal Resources as Mediators*

In contrast to equity theories, that assume a lack of reciprocity behind the negative effects of received social support, other theories predict that self-referent cognitions such as self-esteem, control beliefs and the freedom of choice or autonomy can be threatened by receiving support (Liang, Krause, & Bennett, 2001). Whereas *reactance theory* (Brehm & Cole, 1966) postulates that the major problem for recipients of help is their perceived restriction of freedom, *social breakdown theory* (Bengtson & Kuypers, 1985) assumes an erosion of personal competencies through being assisted in old age. In line with these theories, receiving support is also assumed to indicate to older individuals that their individual coping efforts failed and thus threatens their self-esteem and control beliefs – two crucial mechanisms in the translations of receiving help to health (Bolger, Zuckerman, & Kessler, 2000; Eckenrode & Wethington, 1990; Revenson, Wollman, & Felton, 1983; Wethington & Kessler, 1986).

In summary, these theories assume that receiving external assistance may erode individuals' personal resources, which leads to adverse effects for health and well-being. In Chapter 2 of this thesis, self-referent cognitions are hence examined as mediators between quality of life and anticipating, receiving and providing support.

*Interference and Compensation Hypothesis - Personal Resources as Moderators*

However, research on the interplay of personal and social resources has shown that these “threat to self-referent cognition”-approaches do not represent the whole picture as the mechanism between receiving support, personal resources and detrimental outcomes is not a one-way street as personal and social resources also interact with each other (Schröder, 1997). Therefore, two further possible explanations for adverse effects of receiving support need to be taken into account. Specifically, the *interference hypothesis* claims that receiving social support threatens the adjustment to illnesses in individuals higher in self-efficacy, as they experience restrictions in their freedom of choice through being supported (Schröder, 1997). For individuals with low self-efficacy, however, the *compensation hypothesis* predicts beneficial effects of receiving social support, as these individuals may compensate their lack in personal resources through the acceptance of social support (Schröder, 1997). The compensation and interference hypotheses are tested in Chapter 3 of this thesis.

To sum up, these theories assume that receiving support cannot be seen without taking personal resources and especially self-referent cognitions such as self-esteem and control beliefs into account, which is why Chapter 3 and 4 examined self-efficacy as a moderator in the relation between received social support, autonomy and health behaviours.

*The Social Conflict Approach*

Apart from theories that assume receiving support to be adverse, either by itself or as a function of personal resources, actual social conflict may exert strong adverse effects on well-being of older adults as well (Revenson, Schiaffino, Majerovitz, & Gibofsky, 1991; Rook, 1984). Social conflict is not just the absence of being or feeling supported, but refers to negative social encounters, such as criticism, disapproval, rejection or violation of privacy (Abbey, et al., 1985; Krause & Rook, 2003). Social conflict was consistently found to diminish health and well-being in older adults and those with chronic conditions (Everson-Rose & Lewis, 2005; Finch, et al., 1999). As social conflict and receiving support are constructs that do not substantially negatively correlate, individuals may receive high levels of support and social conflict simultaneously – often from the same source, such as the partner or close relatives (Abbey, et al., 1985; Argyle & Furnham, 1983). The presence of conflict in a relationship does not only affect outcomes directly, but may also be responsible for rendering the effects of well-intended support negative (Holt-Lunstad, Uchino, Smith, & Hicks, 2007; Liang, et al., 2001). This is of particular relevance for older adults’ well-being, as they were found to experience a considerably high number of social conflicts (Krause &

Rook, 2003). To investigate social conflict as explanation, for why received support may have adverse effects in older adults, Chapter 6 of this thesis tests for an interaction between received social support and social conflict.

### *Context for the Thesis*

Ageing individuals experience a shifting balance of gains and losses, with losses outnumbering gains in older age (P. B. Baltes, 1987). Getting older not only brings about biological declines such as diminishing strength and mobility, but enhances the risk of becoming chronically ill as well (M. M. Baltes & Silverberg, 1994; Marengoni, Von Strauss, Rizzuto, Winblad, & Fratiglioni, 2009). With increasing age, chronic physical conditions often accumulate and result in *multimorbidity* – the co-occurrence of two or more illnesses at a time (van den Akker, Buntinx, Metsemakers, Roos, & Knottnerus, 1998). An estimated 61 per cent of men and 65 per cent of women over the age of 60 are affected by multimorbidity (van den Akker et al. 1998). Multimorbidity brings about problems such as lower physical functioning, more frequent health care utilisation, complications of treatment, reduced mobility, activities of daily living, vitality and life expectancy (Fortin, Bravo, Hudon, Lapointe, Almirall, et al., 2006; Fortin, et al., 2004; Gijzen, et al., 2001; Kadam & Croft, 2007; Menotti, et al., 2001; Tooth, et al., 2008). Older adults with multiple illnesses are especially challenged with regard to maintaining physical and mental quality of life as well as a sense of autonomy (Fortin, Bravo, Hudon, Lapointe, Almirall, et al., 2006; Fortin, Bravo, Hudon, Lapointe, Dubois, et al., 2006; Sibley, et al., 2006). This thesis therefore examines those personal and social resources that help older adults to cope with multimorbidity in a way that facilitates high quality of life and autonomy despite various health limitations. This may lead to the development of strategies for health-care providers to prevent or delay institutionalisation of older adults with multiple illnesses.

Personal resources such as control beliefs, and social resources such as the functional aspects of social support, can affect older adult's health behaviours, health status, quality of life and autonomy over time. However, changes in health can also affect personal and social resources. Therefore, reciprocal effects need to be considered as well. For example, individuals who feel highly autonomous despite being multimorbid, are more likely to believe in their capabilities to regularly perform physical exercise, and may also mobilise companions for being active – often independent of their objective health status. However, individuals, who have similarly impaired objective health may simply not believe in their capabilities to perform physical exercise and thus never strive for social support. This dissertation project therefore builds upon a model – graphically

presented in Figure 2 – that adopts a dynamic view of resources and outcomes over time. It represents the idea of bidirectional influences between personal and social resources, health behaviours, health status, quality of life and autonomy derived from the international classification of functioning, disability and health model (Dixon, Johnston, Rowley, & Pollard, 2008).

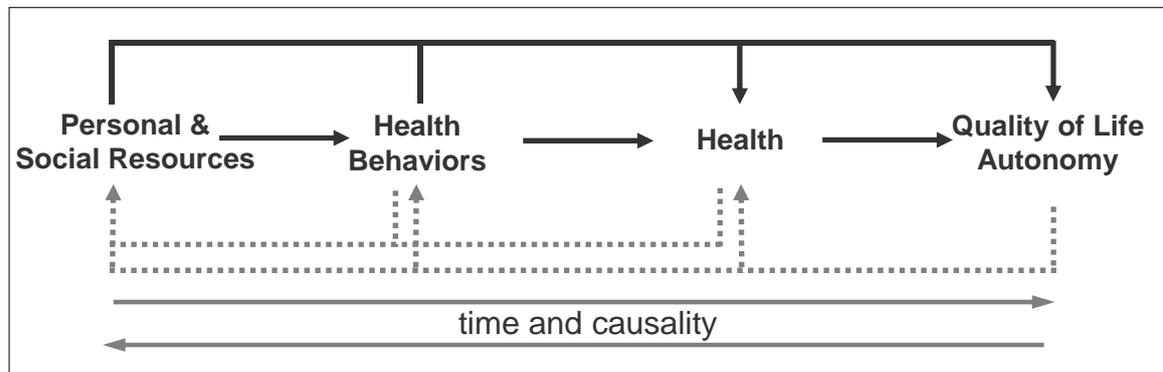


Figure 2. Underlying model of this thesis

#### *The Relevance of Physical Activity and Medication Adherence for Older Adults*

To examine the *behavioural path* from social support to health outcomes, this thesis focused on two health behaviours – exercise and medication adherence. Correspondingly two behaviour-specific received social support measures were assessed.

As individuals with multimorbidity often report chronic pain, mobility limitations and have a high prevalence of weight problems, physical activity bears great potential for improvements in symptoms and overall health status in this population (Hinrichs & Trampisch, 2010; O'Brien, Wyke, Guthrie, Watt, & Mercer, 2010). Physical exercise also has the potential to decelerate the downward spiral of worsening health that individuals with multiple conditions are often confronted with (Bassey, 2005; Chin A Paw, van Uffelen, Riphagen, & van Mechelen, 2008; Hinrichs & Trampisch, 2010; Rejeski & Mihalko, 2001). However, despite the various benefits of exercise and recommendations that were developed specific for older adults (Nelson, et al., 2007) to engage in activities for at least 20 minutes three times per week, only 27 per cent of German adults over the age of 60 report to exercise regularly (Robert Koch-Institut, 2005). Social network members may even foster sedentary behaviour, as they often believe that older adults with chronic diseases need rest and that physical activity should be avoided for its risks, instead of supporting exercise behaviour. However, even older adults with multiple chronic illnesses are able to perform moderate amounts of physical activity, and may maintain and improve their physical health, quality of life and independence through regular moderate exercise (Hudon, Soubhi, & Fortin, 2008).

Adhering to one's medication regime is another relevant health behaviour for individuals with multiple chronic diseases. As the number of prescribed medications increases with the number of diseases an individual accumulates, complicated treatment regimes are very common among individuals with multimorbidity, and hence medication adherence is an important health behaviour in this population (Tinetti, Bogardus, & Agostini, 2004). Yet, individuals with chronic conditions often fail to follow their prescribed treatment reasonably closely (Doggrell, 2010; Osterberg & Blaschke, 2005). Poor medication adherence, however, adds to the complaints that multimorbidity already implies, as it can worsen the overall health status, lead to medication-related hospital admissions and may shorten life expectancy (Simpson, et al., 2006).

Individuals with chronic illnesses were as yet often investigated without taking their comorbidities into account, which neglects the fact that having comorbidities or experiencing multimorbidity is rather the norm than the exception in older ages (Fortin, et al., 2004). Considering that the demographic development entails a higher incidence of multimorbidity in the future (Griffith, Raina, Wu, Zhu, & Stathokostas, 2010), and bearing in mind the risks accumulating and interacting diseases pose for health and well-being, multimorbidity has been under-researched (Greenhalgh, 2008; O'Brien, et al., 2010). This highlights the importance to investigate older adults with multiple chronic illnesses in this thesis.

#### *Studies and Samples for this Thesis*

To examine changes in resources, health behaviours, health status, quality of life and autonomy over time, this thesis bases on a longitudinal design with three points of measurement during the year 2009 that are depicted in Figure 3. Except for Chapter 2, that bases its analyses on the second wave of the German Ageing Survey, all other chapters analysed a sample that was recruited from the third assessment wave of the German Ageing Survey in 2008 (DEAS III) – a population-representative survey of community-dwelling adults age 40 and over with a total sample size of 8,200 (Wurm, Tomasik, & Tesch-Römer, 2010). The DEAS III served as a recruitment pool for participants as well as a baseline assessment for several measures in this thesis (Time 0). DEAS III participants were considered eligible to be contacted if they were a) 65 years or older, b) suffered from at least two chronic physical conditions mentioned either in the Charlson Comorbidity Index (Charlson, Szatrowski, Peterson, & Gold, 1994) or the Functional Comorbidity Index (Groll, To, Bombardier, & Wright, 2005) and c) had given consent to be contacted for further studies.

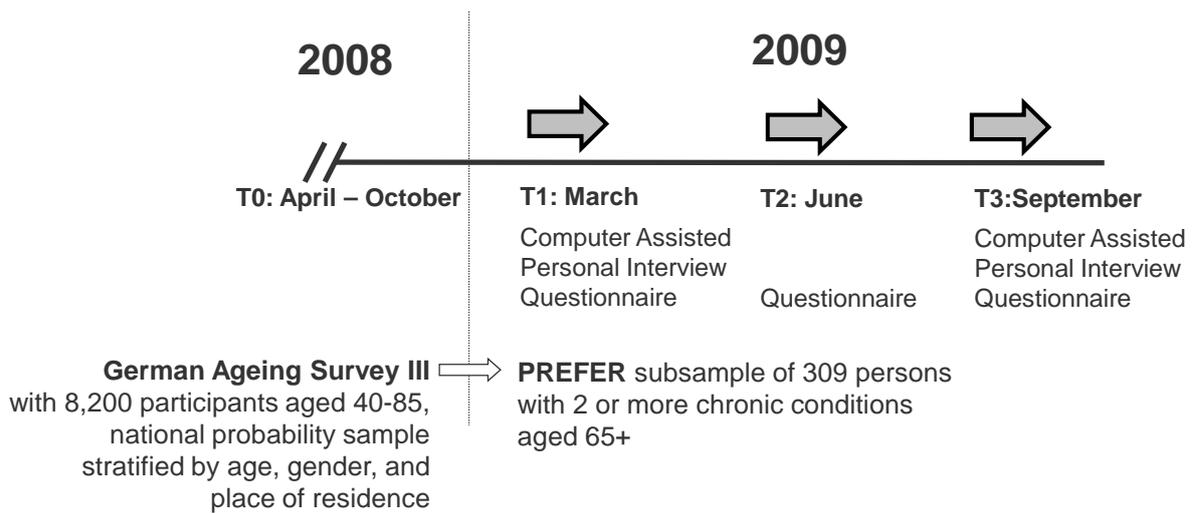


Figure 3. Timeline of measurement points

Out of a pool of 443 eligible participants, who gave informed consent to take part in the study, 309 made an appointment for the first measurement point in time (Time 1; March 2009). Participants were visited at their homes by trained interviewers, completed a 30-minute personal interview and filled in a questionnaire with a prepaid return envelope. The second measurement point in time (Time 2; June 2009) was a questionnaire only that was completed and sent back by 252 individuals (81.6% of Time 1). The third measurement point in time (Time 3; September 2009) contained interview and questionnaire that were completed by 277 individuals (89.6% of Time 1). In total, 235 participants completed all three points of measurement (76.1% of Time 1). As not every empirical Chapter of this thesis conducted analyses over all points in time, the notion *Time 2* refers to the third point of measurement in some chapters. With these three respectively four (with T0) points of measurement, the study covers a time period of 6 respectively 12 months, which is assumed sufficient to observe changes in personal and social resources over time and to elaborate on their interactions with health behaviours, health status, quality of life and autonomy in older persons with multiple chronic conditions.

*Research Aims and Questions of this Thesis*

This thesis aimed at investigating the following research questions:

- 1) Is receiving social support a resource or risk factor for health behaviour, quality of life and autonomy in older adults with multiple chronic conditions?
- 2) Under which conditions is received support a risk factor – methodological issues, such as the mobilisation (Chapter 3, 6) or matching hypothesis (Chapter 4, 5, 6), or the interplay with self-esteem (Chapter 2), self-efficacy (Chapter 2, 3, 4, 5) and social conflict (Chapter 6)?
- 3) Under which conditions is received support a resource? Does the support need to be matched to the outcome or does the investigated outcome per se make a difference (Chapter 4, 5, 6)? And which type of received support is beneficial for whom (Chapter 3, 4, 5, 6)?

Chapters 2 and 3 investigate the psychological pathway that is assumed to link social support to health and well-being, while Chapters 4 to 6 elaborate on the behavioural pathway. Chapter 7 provides an overall discussion of the empirical chapters, integrates them, and puts them into a broader perspective. The general discussion develops implications not only for future research, but also for older adults and their care-givers on how social resources can facilitate the maintenance of autonomy and quality of life despite multimorbidity.

## References

- Abbey, A., Abramis, D. J., & Caplan, R. D. (1985). Effects of different sources of social support and social conflict on emotional well-being. *Basic and Applied Social Psychology*, *6*, 111-129. doi: 10.1207/s15324834basp0602\_2
- Antonucci, T. C., & Akiyama, H. (1987). An examination of sex differences in social support among older men and women. *Sex Roles*, *17*, 737-749.
- Argyle, M., & Furnham, A. (1983). Sources of satisfaction and conflict in long-term relationships. *Journal of Marriage & Family*, *45*, 481. doi: 10.2307/351654
- Ashford, S., Edmunds, J., & French, D. P. (2010). What is the best way to change self-efficacy to promote lifestyle and recreational physical activity? A systematic review with meta-analysis. *British Journal of Health Psychology*, *15*, 265–288. doi: 10.1348/135910709X461752
- Baltes, M. M., & Silverberg, S. (1994). The dynamics between dependency and autonomy: illustrations across the life span. In D. L. Featherman, R. M. Lerner & M. Perlmutter (Eds.), *Life-span development and behavior* (Vol. 12, pp. 41-90). Hillsdale, NJ: Erlbaum.
- Baltes, P. B. (1987). Theoretical propositions of life-span developmental psychology: On the dynamics between growth and decline. *Developmental Psychology*, *23*, 611-626.
- Bandura, A. (1997). *Self-efficacy: the exercise of control*. New York: Freeman.
- Barrera, M. (1986). Distinctions between social support concepts, measures, and models. *American Journal of Community Psychology*, *14*, 413-445. doi: 10.1007/BF00922627

- Bassey, E. J. (2005). The benefits of physical activity for health in older people - an update. *Reviews in Clinical Gerontology, 15*, 1-8. doi: 10.1017/S0959259805001711
- Bengtson, V. L., & Kuypers, J. A. (1985). The family support cycle: Psycho-social issues in the aging family. In P. M. J. M. A. Munnichs, & E. Olbrich (Ed.), *Life span and change in a gerontological perspective* (pp. 61-77). New York: Academic Press.
- Benight, C. C., & Bandura, A. (2004). Social cognitive theory of posttraumatic recovery: the role of perceived self-efficacy. *Behaviour Research & Therapy, 42*, 1129-1148. doi: 10.1016/j.brat.2003.08.008
- Berkman, L. F., & Glass, T. (2000). From social integration to health: Durkheim in the new millenium. *Social Science & Medicine, 51*, 843-857 doi: 10.1016/S0277-9536(00)00065-4
- Berkman, L. F., & Syme, S. L. (1979). Social networks, host resistance, and mortality: a nine-year follow-up study of Alameda County residents. *American Journal of Epidemiology, 109*, 186-204.
- Bisschop, M. I., Kriegsman, D. M. W., Beekman, A. T. F., & Deeg, D. J. H. (2004). Chronic diseases and depression: the modifying role of psychosocial resources. *Social Science & Medicine, 59*, 721-733. doi: 10.1016/j.socscimed.2003.11.038
- Bolger, N., & Amarel, D. (2007). Effects of social support visibility on adjustment to stress: experimental evidence. *Journal of Personality and Social Psychology, 92*, 458-475. doi: 10.1037/0022-3514.92.3.458
- Bolger, N., Zuckerman, A., & Kessler, R. C. (2000). Invisible support and adjustment to stress. *Journal of Personality and Social Psychology, 79*, 953-961. doi: 10.1037//0022-3514.79.6.953
- Brand, E. F., Lakey, B., & Berman, S. (1995). A preventive, psychoeducational approach to increase perceived social support. *American Journal of Community Psychology, 23*, 117-135. doi: 10.1007/BF02506925
- Brehm, J. W., & Cole, A. H. (1966). Effect of a favor which reduces freedom. *Journal of Personality and Social Psychology, 3*, 420-426. doi: 10.1037/h0023034
- Brown, S. L. (2007). Health effects of caregiving: studies of helping behavior needed. *Alzheimer's Care Today, 8*, 235-246. doi: 10.1097/01.ALCAT.0000281871.81270.eb
- Brown, S. L., Nesse, R. M., Vinokur, A. D., & Smith, D. M. (2003). Providing social support may be more beneficial than receiving it: results from a prospective study of mortality. *Psychological Science, 14*, 320-327. doi: 10.1111/1467-9280.14461
- Brummett, B. H., Mark, D. B., Siegler, I. C., Williams, R. B., Babyak, M. A., Clapp-Channing, N. E., et al. (2005). Perceived social support as a predictor of mortality in coronary patients: effects of smoking, sedentary behavior, and depressive symptoms. *Psychosomatic Medicine, 67*, 40-45. doi: 10.1097/01.psy.0000149257.74854.b7
- Carstensen, L. L. (1992). Social and emotional patterns in adulthood: support for socioemotional selectivity theory. *Psychology and Aging, 7*, 331-338. doi: 10.1037//0882-7974.7.3.331

- Charlson, M. E., Szatrowski, T. P., Peterson, J., & Gold, J. (1994). Validation of a combined comorbidity index. *Journal of Clinical Epidemiology*, *47*, 1245-1251. doi: 10.1016/0895-4356(94)90129-5
- Chen, G., Gully, S. M., Whiteman, J. A., & Kilcullen, R. N. (2000). Examination of relationships among trait-like individual differences, state-like individual differences, and learning performance. *The Journal of Applied Psychology*, *85*, 835-847. doi: 10.1037//0021-9010.85.6.835
- Chin A Paw, M. J. M., van Uffelen, J. G. Z., Riphagen, I., & van Mechelen, W. (2008). The functional effects of physical exercise training in frail older people: a systematic review. *Sports Medicine*, *38*, 781-793. doi: 10.2165/00007256-200838090-00006
- Cohen, J. L., Lakey, B., Tiell, K., & Neeley, L. C. (2005). Recipient-provider agreement on enacted support, perceived support, and provider personality. *Psychological Assessment*, *17*, 375-378. doi: 10.1037/1040-3590.17.3.375
- Cohen, S. (2004). Social relationships and health. *American Psychologist*, *59*, 676-684. doi: 10.1037/0003-066X.59.8.676
- Cohen, S., Doyle, W. J., Skoner, D. P., Rabin, B. S., & Gwaltney, J. M., Jr. (1997). Social ties and susceptibility to the common cold. *JAMA*, *277*, 1940-1944. doi: 10.1001/jama.277.24.1940
- Cohen, S., & Janicki-Deverts, D. (2009). Can we improve our physical health by altering our social networks? *Perspectives on Psychological Science*, *4*, 375-378. doi: 10.1111/j.1745-6924.2009.01141.x
- Cutrona, C. E. (1990). Stress and social support: in search of optimal matching. *Journal of Social & Clinical Psychology*, *9*, 3-14. doi: 10.1521/jscp.1990.9.1.3
- de Vries, A. C., Craft, T. K. S., Glasper, E. R., Neigh, G. N., & Alexander, J. K. (2007). Social influences on stress responses and health. *Psychoneuroendocrinology*, *32*, 587-603. doi: doi:10.1016/j.psyneuen.2007.04.007
- De Vries, H., Kremers, S., Smeets, T., & Reubsæet, A. (2008). Clustering of diet, physical activity and smoking and a general willingness to change. *Psychology & Health*, *23*, 265-278. doi: 10.1080/14768320701349107
- DiMatteo, M. R. (2004). Social support and patient adherence to medical treatment: a meta-analysis. *Health Psychology*, *23*, 207-218. doi: 10.1037/0278-6133.23.2.207
- Dishman, R. K., Saunders, R. P., Motl, R. W., Dowda, M., & Pate, R. R. (2009). Self-efficacy moderates the relation between declines in physical activity and perceived social support in high school girls. *Journal of Pediatric Psychology*, *34*, 441-451. doi: 10.1093/jpepsy/jsn100
- Dixon, D., Johnston, M., Rowley, D., & Pollard, B. (2008). Using the ICF and psychological models of behavior to predict mobility limitations. *Rehabilitation Psychology*, *53*, 191-200. doi: 10.1037/0090-5550.53.2.191
- Doggrell, S. A. (2010). Adherence to medicines in the older-aged with chronic conditions: does intervention by an allied health professional help? *Drugs & Aging*, *27*, 239-254. doi: 10.2165/11532870-000000000-00000

- Eckenrode, J., & Wethington, E. (1990). The process and outcome of mobilizing social support. In S. W. Duck & R. C. Silver (Eds.), *Personal relationships and social support* (pp. 83-103). Thousand Oaks, CA: Sage Publications.
- Everson-Rose, S. A., & Lewis, T. T. (2005). Psychosocial factors and cardiovascular diseases. *Annual Review of Public Health, 26*, 469-500. doi: 10.1146/annurev.publhealth.26.021304.144542
- Eyler, A. A., & Brownson, R. C. (1999). Physical activity social support and middle- and older-aged minority women: Results from a US survey. *Social Science & Medicine, 49*, 781-789. doi: 10.1016/S0277-9536(99)00137-9
- Filazoglu, G., & Griva, K. (2008). Coping and social support and health related quality of life in women with breast cancer in Turkey. *Psychology, Health & Medicine, 13*, 559-573. doi: 10.1080/13548500701767353
- Finch, J. F., Okun, M. A., Barrera, M., Jr., Zautra, A. J., & Reich, J. W. (1989). Positive and negative social ties among older adults: measurement models and the prediction of psychological distress and well-being. *American Journal of Community Psychology, 17*, 585-605.
- Finch, J. F., Okun, M. A., Pool, G. J., & Ruehlman, L. S. (1999). A comparison of the influence of conflictual and supportive social interactions on psychological distress. *Journal of Personality, 67*, 581-622. doi: 10.1111/1467-6494.00066
- Fisher, E., La Greca, A., Greco, P., Arfken, C., & Schneiderman, N. (1997). Directive and nondirective social support in diabetes management. *International Journal of Behavioral Medicine, 4*, 131-144. doi: 10.1207/s15327558ijbm0402\_3
- Fisher, J. D., Nadler, A., & Whitcher-Alagna, S. (1982). Recipient reactions to aid. *Psychological Bulletin, 91*, 27-54. doi: 10.1037//0033-2909.91.1.27
- Fortin, M., Bravo, G., Hudon, C., Lapointe, L., Almirall, J., Dubois, M.-F., et al. (2006). Relationship between multimorbidity and health-related quality of life of patients in primary care. *Quality of Life Research, 15*, 83-91. doi: 10.1007/s11136-005-8661-z
- Fortin, M., Bravo, G., Hudon, C., Lapointe, L., Dubois, M.-F., & Almirall, J. (2006). Psychological distress and multimorbidity in primary care. *Annals of Family Medicine, 4*, 417-422. doi: 10.1370/afm.528
- Fortin, M., Lapointe, L., Hudon, C., Vanasse, A., Ntetu, A. L., & Maltais, D. (2004). Multimorbidity and quality of life in primary care: a systematic review. *Health and Quality of Life Outcomes, 2*, 51-63. doi: 10.1186/1477-7525-1182-1151
- Gallant, M. P. (2003). The influence of social support on chronic illness self-management: a review and directions for research. *Health Education & Behavior, 30*, 170-195. doi: 10.1177/1090198102251030
- Gijzen, R., Hoeymans, N., Schellevis, F. G., Ruwaard, D., Satariano, W. A., & van den Bos, G. A. (2001). Causes and consequences of comorbidity: A review. *Journal of Clinical Epidemiology, 54*, 661-674. doi: 10.1016/S0895-4356(00)00363-2

- Gleason, M. E. J., Iida, M., Bolger, N., & Shrout, P. E. (2003). Daily supportive equity in close relationships. *Personality & Social Psychology Bulletin*, *29*, 1036-1045. doi: 10.1177/0146167203253473
- Greenberg, M. S. (1980). A theory of indebtedness. In M. S. G. K. Gergen, R. Willis (Ed.), *Social exchange: Advances in theory and research* (pp. 3-26). New York: Plenum Press.
- Greenhalgh, T. (2008). *Primary health care: theory and practice*. Oxford, UK: Blackwell Publishing.
- Griffith, L., Raina, P., Wu, H., Zhu, B., & Stathokostas, L. (2010). Population attributable risk for functional disability associated with chronic conditions in Canadian older adults. *Age and Ageing*, *39*, 738-745. doi: 10.1093/ageing/afq105
- Groll, D. L., To, T., Bombardier, C., & Wright, J. G. (2005). The development of a comorbidity index with physical function as the outcome. *Journal of Clinical Epidemiology*, *58*, 595-602. doi: 10.1016/j.jclinepi.2004.10.018
- Hays, J., Saunders, W., Flint, E., Kaplan, B., & Blazer, D. (1997). Social support and depression as risk factors for loss of physical function in late life. *Aging & Mental Health*, *1*, 209-220. doi: 10.1080/13607869757092
- Helgeson, V. S. (1993). Two important distinctions in social support: kind of support and perceived versus received. *Journal of Applied Social Psychology*, *23*, 825-845. doi: 10.1111/j.1559-1816.1993.tb01008.x
- Hinrichs, T., & Trampisch, U. (2010). Körperliche Aktivität bei multimorbiden Patienten [Physical activity in multimorbid patients]. *Public Health Forum*, *18*, 29.e21-29.e24 doi: 10.1016/j.phf.2009.12.016
- Hogan, B. E., Linden, W., & Najarian, B. (2002). Social support interventions: do they work? *Clinical Psychology Review*, *22*, 381-440. doi: 10.1016/S0272-7358(01)00102-7
- Holt-Lunstad, J., Uchino, B. N., Smith, T. W., & Hicks, A. (2007). On the importance of relationship quality: the impact of ambivalence in friendships on cardiovascular functioning. *Annals of Behavioral Medicine*, *33*, 278-290. doi: 10.1007/BF02879910
- Horowitz, L. M., Krasnoperova, E. N., Tatar, D. G., Hansen, M. B., Person, E. A., Galvin, K. L., et al. (2001). The way to console may depend on the goal: experimental studies of social support. *Journal of Experimental Social Psychology*, *37*, 49-61. doi: 10.1006/jesp.2000.1435
- House, J. S., Landis, K. R., & Umberson, D. (1988). Social relationships and health. *Science*, *241*, 540-545. doi: 10.1126/science.3399889
- Hudon, C., Soubhi, H., & Fortin, M. (2008). Relationship between multimorbidity and physical activity: secondary analysis from the Quebec health survey. *BMC Public Health*, *8*, 304-304. doi: 10.1186/1471-2458-8-304
- Kadam, U. T., & Croft, P. R. (2007). Clinical multimorbidity and physical function in older adults: a record and health status linkage study in general practice. *Family Practice*, *24*, 412-419. doi: 10.1093/fampra/cmm049
- Kessler, R. C., McLeod, J. D., & Wethington, E. (1985). The costs of caring: a perspective on the relationship between sex and psychological distress. In I. Sarason & B. Sarason (Eds.),

- Social Support: Theory, Research and Applications* (pp. 491-506). The Hague: Martinus Nijhoff.
- Krause, N., Herzog, A. R., & Baker, E. (1992). Providing support to others and well-being in later life. *Journals of Gerontology*, *47*, 300-311. doi: 10.1093/geronj/47.5.P300
- Krause, N., & Rook, K. S. (2003). Negative interaction in late life: issues in the stability and generalizability of conflict across relationships. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *58*, 88-99. doi: 10.1093/geronb/58.2.P88
- Krause, N., & Shaw, B. A. (2000). Giving social support to others, socioeconomic status, and changes in self-esteem in late life. *Journals of Gerontology Series B: Psychological Sciences & Social Sciences*, *55*, 323-333. doi: 10.1093/geronb/55.6.S323
- Kriegsman, D. M. W., Penninx, B. W. H. J., & van Eijk, J. T. M. (1995). A criterion-based literature survey of the relationship between family support and incidence and course of chronic disease in the elderly. *Family Systems Medicine*, *13*, 39-68. doi: 10.1037/h0089392
- Lakey, B., & Cohen, J. L. (2007). Social support assessment. In S. Ayers, A. Baum, C. McManus, S. Newman, K. Wallston, J. Weinman & R. West (Eds.), *Cambridge Handbook of Psychology, Health, & Medicine* (pp. 321-326). Cambridge, England: Cambridge University Press.
- Lakey, B., & Scoboria, A. (2005). The relative contribution of trait and social influences to the links among perceived social support, affect, and self-esteem. *Journal of Personality*, *73*, 361-388. doi: 10.1111/j.1467-6494.2005.00312.x
- Liang, J., Krause, N. M., & Bennett, J. M. (2001). Social exchange and well-being: Is giving better than receiving? *Psychology and Aging*, *16*, 511-523. doi: 10.1037//0882-7974.16.3.511
- Marengoni, A., Von Strauss, E., Rizzuto, D., Winblad, B., & Fratiglioni, L. (2009). The impact of chronic multimorbidity and disability on functional decline and survival in elderly persons. A community-based, longitudinal study. *Journal of Internal Medicine*, *265*, 288-295. doi: 10.1111/j.1365-2796.2008.02017.x
- Martire, L. M., Lustig, A. P., Schulz, R., Miller, G. E., & Helgeson, V. S. (2004). Is it beneficial to involve a family member? A meta-analysis of psychosocial interventions for chronic illness. *Health Psychology*, *23*, 599-611. doi: 10.1037/0278-6133.23.6.599
- Mendes de Leon, C. F., Gold, D. T., Glass, T. A., Kaplan, L., & George, L. K. (2001). Disability as a function of social networks and support in elderly African Americans and Whites: the Duke EPESE 1986-1992. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *56*, 179-190. doi: 10.1093/geronb/56.3.S179
- Menotti, A., Mulder, I., Nissinen, A., Giampaoli, S., Feskens, E. J., & Kromhout, D. (2001). Prevalence of morbidity and multimorbidity in elderly male populations and their impact on 10-year all-cause mortality: the FINE study (Finland, Italy, Netherlands, Elderly). *Journal of Clinical Epidemiology*, *54*, 680-686. doi: 10.1016/S0895-4356(00)00368-1
- Midlarsky, E. (1991). Helping as coping. In M. S. Clark (Ed.), *Prosocial Behavior* (pp. 238-264). Newbury Park: Sage Publications.

- Nelson, M. E., Rejeski, W. J., Blair, S. N., Duncan, P. W., Judge, J. O., King, A. C., et al. (2007). Physical activity and public health in older adults: recommendation from the American College of Sports Medicine and the American Heart Association. *Circulation*, *116*, 1094-1105. doi: 10.1249/mss.0b013e3180616aa2
- Newsom, J. T., & Schulz, R. (1998). Caregiving from the recipient's perspective: negative reactions to being helped. *Health Psychology*, *17*, 172-181. doi: 10.1037//0278-6133.17.2.172
- O'Brien, R., Wyke, S., Guthrie, B., Watt, G., & Mercer, S. (2010). An 'endless struggle': a qualitative study of general practitioners' and practice nurses' experiences of managing multimorbidity in socio-economically deprived areas of Scotland. *Chronic Illness*. doi: 10.1177/1742395310382461
- Osterberg, L., & Blaschke, T. (2005). Drug therapy: adherence to medication. *The New England Journal of Medicine*, *353*, 487-497. doi: 10.1056/NEJMra050100
- Park, C. L., & Gaffey, A. E. (2007). Relationships between psychosocial factors and health behavior change in cancer survivors: an integrative review. *Annals of Behavioral Medicine*, *34*, 115-134. doi: 10.1007/BF02872667
- Penninx, B. W. J. H., Van Tilburg, T., Deeg, D. J. H., & Kriegsman, D. M. W. (1997). Direct and buffer effects of social support and personal coping resources in individuals with arthritis. *Social Science & Medicine*, *44*, 393-402. doi: 10.1016/S0277-9536(96)00156-6
- Reich, J. W., & Zautra, A. J. (1995). Spouse encouragement of self-reliance and other-reliance in rheumatoid arthritis couples. *Journal of Behavioral Medicine*, *18*, 249. doi: 10.1007/BF01857872
- Rejeski, W. J., & Mihalko, S. L. (2001). Physical activity and quality of life in older adults. *Journals of Gerontology Series A: Biological Sciences & Medical Sciences*, *56*, 23. doi: 10.1093/gerona/56.suppl\_2.23
- Revenson, T. A. (1990). Social support processes among chronically ill elders: patient and provider perspectives. In N. C. H. Giles, & J. M. Weimann (Ed.), *Communications, health, and the elderly* (pp. 92-113). Manchester: Manchester Univ. Press.
- Revenson, T. A., Schiaffino, K. M., Majerovitz, S. D., & Gibofsky, A. (1991). Social support as a double-edged sword: the relations of positive and problematic support to depression among rheumatoid arthritis patients. *Social Science & Medicine*, *33*, 807-813. doi: 10.1016/0277-9536(91)90385-P
- Revenson, T. A., Wollman, C. A., & Felton, B. J. (1983). Social supports as stress buffers for adult cancer patients. *Psychosomatic Medicine*, *45*, 321-331.
- Riessman, F. (1965). The "Helper" Therapy Principle. *Social Work*, *10*, 27-32.
- Robert Koch-Institut. (2005). *Ergänzende Wertetabellen zu den Abbildungen des Themenhefts 26 - Körperliche Aktivität. Gesundheitsberichterstattung des Bundes. [Additional data for graphics from booklet 26 - physical activity. German Health Report.]*. Berlin: RKI.
- Roberts, K. J., Lepore, S. J., & Helgeson, V. S. (2006). Social-cognitive correlates of adjustment to prostate cancer. *Psycho-Oncology*, *15*, 183-192. doi: 10.1002/pon.934
- Rodin, J. (1986). Aging and health: effects of the sense of control. *Science*, *233*, 1271-1276.

- Roe, B., Whattam, M., Young, H., & Dimond, M. (2001). Elders' perceptions of formal and informal care: aspects of getting and receiving help for their activities of daily living. *Journal of Clinical Nursing, 10*, 398-405. doi: 10.1046/j.1365-2702.2001.00484.x
- Rook, K. S. (1984). The negative side of social interaction: impact on psychological well-being. *Journal of Personality and Social Psychology, 46*, 1097-1108. doi: 10.1037/0022-3514.46.5.1097
- Rook, K. S., & Schuster, T. L. (1996). Compensatory processes in the social networks of older adults. In G. R. Pierce, B. R. Sarason & I. G. Sarason (Eds.), *Handbook of social support and the family*. (pp. 219-248). New York, NY, US: Plenum Press.
- Sarason, I. G., Levine, H. M., Basham, R. B., & Sarason, B. R. (1983). Assessing social support: the Social Support Questionnaire. *Journal of Personality and Social Psychology, 44*, 127-139. doi: 10.1037/0022-3514.44.1.127
- Schreurs, K. M. G., De Ridder, D. T. D., & Bensing, J. M. (2000). A one year study of coping, social support and quality of life in Parkinson's Disease. *Psychology & Health, 15*, 109-121. doi: 10.1080/08870440008400292
- Schröder, K. (1997). *Self-regulation competence in coping with chronic disease*. Münster: Waxmann.
- Schwarzer, R. (2008). Perceived Autonomy in Old Age Retrieved January 19, 2010, from <http://userpage.fu-berlin.de/~health/autonomy.htm>
- Schwarzer, R., & Knoll, N. (2007). Functional roles of social support within the stress and coping process: A theoretical and empirical overview. *International Journal of Psychology, 42*, 243-252. doi: 10.1080/00207590701396641
- Schwarzer, R., & Leppin, A. (1991). Social support and health: a theoretical and empirical overview. *Journal of Social and Personal Relationships, 8*, 99-127. doi: 10.1177/0265407591081005
- Schwarzer, R., & Schulz, U. (2000). Berlin Social Support Scales (BSSS) Retrieved January 19, 2010, from [www.coping.de](http://www.coping.de)
- Schwartz, C., & Sendor, M. (1999). Helping others helps oneself: response shift effects in peer support. *Social Science & Medicine, 48*, 175-188. doi: 10.1037/10382-012
- Seeman, T. E., Bruce, M. L., & McAvay, G. J. (1996). Social network characteristics and onset of ADL disability: MacArthur studies of successful aging. *Journals of Gerontology: Series B: Psychological Sciences and Social Sciences, 51*, 191-200. doi: 10.1093/geronb/51B.4.S191
- Seidman, G., Shrout, P. E., & Bolger, N. (2006). Why is enacted social support associated with increased distress? Using simulation to test two possible sources of spuriousness. *Personality and Social Psychology Bulletin, 32*, 52-65. doi: 10.1177/0146167205279582
- Shin, S. Y., & Kolanowski, A. M. (2009). Best evidence of psychosocially focused nonpharmacologic therapies for symptom management in older adults with osteoarthritis. *Pain Management Nursing, 11*, 234-244. doi: 10.1016/j.pmn.2009.06.001

- Sibley, A., Kersten, P., Ward, C. D., White, B., Mehta, R., & George, S. (2006). Measuring autonomy in disabled people: validation of a new scale in a UK population. *Clinical Rehabilitation, 20*, 793-803. doi: 10.1177/0269215506070808
- Silverstein, M., & Bengtson, V. L. (1994). Does intergenerational social support influence the psychological well-being of older parents? The contingencies of declining health and widowhood: frailty and its consequences. *Social Science & Medicine, 38*, 943-957. doi: 10.1016/0277-9536(94)90427-8
- Simpson, S. H., Eurich, D. T., Majumdar, S. R., Padwal, R. S., Tsuyuki, R. T., Varney, J., et al. (2006). A meta-analysis of the association between adherence to drug therapy and mortality. *British Medical Journal, 333*. doi: 10.1136/bmj.38875.675486.55
- Smith, J., & Goodnow, J. J. (1999). Unasked-for support and unsolicited advice: age and the quality of social experience. *Psychology and Aging, 14*, 108-121. doi: 10.1037/0882-7974.14.1.108
- Taylor, S. E. (2007). Social support. In H. S. Friedman & R. C. Silver (Eds.), *Foundations of Health Psychology* (pp. 145-171). New York, NY: Oxford University Press.
- Thorsteinsson, E. B., & James, J. E. (1999). A meta-analysis of the effects of experimental manipulations of social support during laboratory stress. *Psychology & Health, 14*, 869. doi: 10.1080/08870449908407353
- Thrasher, J. F., Campbell, M. K., & Oates, V. (2004). Behavior-specific social support for healthy behaviors among African American church members: applying Optimal Matching Theory. *Health Education & Behavior, 31*, 193-205. doi: 10.1177/1090198103259184
- Tinetti, M. E., Bogardus, S. T., & Agostini, J. V. (2004). Potential pitfalls of disease-specific guidelines for patients with multiple conditions. *New England Journal of Medicine, 351*, 2870-2874. doi: 10.1056/NEJMs042458
- Tooth, L., Hockey, R., Byles, J., & Dobson, A. (2008). Weighted multimorbidity indexes predicted mortality, health service use, and health-related quality of life in older women. *Journal of Clinical Epidemiology, 61*, 151-159. doi: 10.1016/j.jclinepi.2007.05.015
- Uchino, B. N., Cacioppo, J. T., & Kiecolt-Glaser, J. K. (1996). The relationship between social support and physiological processes: a review with emphasis on underlying mechanisms and implications for health. *Psychological Bulletin, 119*, 488-531. doi: 10.1037/0033-2909.119.3.488
- Uchino, B. N. (2009). Understanding the links between social support and physical health: a life-span perspective with emphasis on the separability of perceived and received support. *Perspectives on Psychological Science, 4*, 236-255. doi: 10.1111/j.1745-6924.2009.01122.x
- Väänänen, A., Vahtera, J., Pentti, J., & Kivimäki, M. (2005). Sources of social support as determinants of psychiatric morbidity after severe life events: prospective cohort study of female employees. *Journal of Psychosomatic Research, 58*, 459-467. doi: 10.1016/j.jpsychores.2004.10.006

- van den Akker, M., Buntinx, F., Metsemakers, J. F., Roos, S., & Knottnerus, J. A. (1998). Multimorbidity in general practice: prevalence, incidence, and determinants of co-occurring chronic and recurrent diseases. *Journal of Clinical Epidemiology*, *51*, 367-375. doi: 10.1016/S0895-4356(97)00306-5
- Vaux, A., Riedel, S., & Stewart, D. (1987). Modes of social support: the social support behaviors (SS-B) scale. *American Journal of Community Psychology*, *15*, 209-232. doi: 10.1007/BF00919279
- Vinokur, A. D., & Van Ryn, M. (1993). Social support and undermining in close relationships: their independent effects on the mental health of unemployed persons. *Journal of Personality and Social Psychology*, *65*, 350-359. doi: 10.1037/0022-3514.65.2.350
- Von Bergen, C. W., Soper, B., Rosenthal, G. T., Cox, S. J., & Fullerton, R. (1999). When helping hurts: negative effects of benevolent care. *Journal of the American Psychiatric Nurses Association*, *5*, 134-136. doi: 10.1177/107839039900500406
- Walster, E. G., Walster, W., & Berscheid, E. (1978). *Equity: Theory and Research*. Boston.
- Warner, L. M., Schüz, B., Wurm, S., Ziegelmann, J. P., & Tesch-Römer, C. (2010). Giving and taking – differential effects of providing, receiving and anticipating emotional support on quality of life in adults with multiple illnesses. *Journal of Health Psychology*, *15*, 660-670. doi: 10.1177/1359105310368186
- Wethington, E., & Kessler, R. C. (1986). Perceived support, received support, and adjustment to stressful life events. *Journal of Health and Social Behavior*, *27*, 78-89. doi: 10.2307/2136504
- Williams, G. C., Rodin, G. C., Ryan, R. M., Grolnick, W. S., & Deci, E. L. (1998). Autonomous regulation and long-term medication adherence in adult outpatients. *Health Psychology*, *17*, 269-276.
- Wortman, C. B., & Conway, T. L. (1985). The role of social support in adaptation and recovery from physical illness. In S. Cohen & S. L. Syme (Eds.), *Social support and health* (pp. 281-298). New York: Academic Press.
- Wurm, S., Tomasik, M. J., & Tesch-Römer, C. (2010). On the importance of a positive view on ageing for physical exercise among middle-aged and older adults: cross-sectional and longitudinal findings. *Psychology & Health*, *25*, 25 - 42. doi: 10.1080/08870440802311314
- Zautra, A. J., Reich, J. W., & Newsom, J. T. (1995). Autonomy and sense of control among older adults: an examination of their effects on mental health. In L. Bond, S. Cutler & A. Grams (Eds.), *Promoting Successful and Productive Aging* (pp. 153–170). Newbury Park, CA: Sage.

# 2

## Giving and Taking – Differential Effects of Providing, Receiving and Anticipating Emotional Support on Quality of Life in Adults with Multiple Illnesses

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### **Abstract**

Multimorbidity challenges quality of life (QoL) in old age. Anticipating and providing social support have been shown to promote QoL whereas receiving support often had detrimental effects. Little is known about which psychological processes explain these effects. This study examines the effects of receiving, anticipating and providing emotional support on QoL, with control beliefs and self-esteem as simultaneous mediators in an elderly multimorbid sample ( $N = 1415$ ). Anticipating and providing support positively predicted QoL, mediated through self-esteem and control beliefs. Received support negatively predicted QoL, without mediation. Self-esteem and control beliefs can help to explain the relation between QoL and support.

*Keywords:*

control beliefs, multimorbidity, multiple mediation, quality of life, self-esteem, social support

## Introduction

One of the drawbacks of getting older is an increasing susceptibility for diseases. Many people accumulate illnesses with age, and it has been estimated that between 61 % (males) and 65 % (females) of the population over 60 suffer from two or more co-occurring diseases (van den Akker, Buntinx, Metsemakers, Roos, & Knottnerus, 1998). This accumulation of chronic conditions poses a serious threat to quality of life (QoL) and independence for those affected (Fortin et al., 2004). Social support is an important resource for QoL in multimorbid elderly, but *providing* emotional support to others is more beneficial than *receiving* emotional support (Schwartz & Sendor, 1999). Additionally, the *anticipation* of emotional support is an important resource for maintaining QoL in elderly individuals with multiple illnesses (Bisschop, Kriegsman, Beekman, & Deeg, 2004). However, which mediators translate the effects of emotional support into QoL has been under-researched so far. This study tries to disentangle the effects of receiving, anticipating and providing emotional support on QoL in a sample of older individuals with multiple illnesses by examining the role of self-esteem and control beliefs as potential mediators of the effects of support on QoL.

### *Multimorbidity and Quality of Life in Later Adulthood*

Due to the longer life expectancy and demographical change, the number of people with two or more chronic illnesses has increased in recent years (van den Akker et al., 1998). This means that more and more people are affected by the problems associated with multimorbidity such as lower physical functioning, more frequent health care utilisation, treatment complications, and lower emotional well-being (e.g. Fortin et al., 2004; Gijzen et al., 2001). These problems in turn are associated with major losses in physical and mental QoL (Fortin et al., 2004). Therefore, one key task for research is identifying resources that enable individuals with multiple chronic conditions to sustain their physical and mental QoL. Previous research suggests that social support is a promising resource for physical and mental QoL despite multimorbidity (Fortin et al., 2006).

### *Social Support and Quality of Life*

There is somewhat inconsistent evidence regarding the effects of *receiving support* on QoL – some studies (e.g. Schwarzer & Knoll, 2007) report positive effects, other studies find no associations (e.g. Brown, Nesse, Vinokur, & Smith, 2003), and quite some studies even report harmful effects of receiving support on QoL (e.g. Newsom & Schulz, 1998). In cross-sectional studies,

negative relations between receiving support and QoL are more likely, as receiving support can be an indicator of poor health and functioning (Schwarzer & Leppin, 1991).

In contrast, *anticipated* support (also referred to as *perceived* or *available* support) is an individual's perception of the support which would be available should it be needed (Dunkel-Schetter, Bennett, Sarason, Sarason, & Pierce, 1990). It is assumed to be a relatively stable individual characteristic, which is linked closely to thoughts about the self such as self-esteem or self-efficacy (Sarason, Levine, Basham, & Sarason, 1983). Anticipated support has positive effects on QoL both in people with and without illnesses (e.g. Kriegsman, Penninx, & van Eijk, 1995).

It has been suggested that *providing support* is beneficial for both the helped and the helper (Riessman, 1965), and that even chronically ill persons can reciprocate support (e.g. Kuijer, Buunk, & Ybema, 2001) and in turn profit in terms of health and well-being. Providing support has been found to enhance mental QoL, coping, and purpose-in-life, while it reduces depressive symptoms, anxiety and levels of mortality in the support provider (e.g. Brown et al., 2003; Schwartz, Meisenhelder, Ma, & Reed, 2003).

#### *Working Mechanisms*

The finding that *received* support challenges QoL is in line with social breakdown theory (Bengtson & Kuypers, 1986), which posits that received support can result in greater feelings of dependency by eroding personal competencies. Receiving support is assumed to be a marker of failed individual coping efforts and a threat to self-esteem and control beliefs, which in turn negatively affect QoL (e.g. Revenson, Wollman, & Felton, 1983; Wethington & Eckenrode, 1986).

The underlying mechanism for positive effects of *anticipated* support on QoL is assumed to be the awareness of potentially helpful others, which helps individuals to construe social safety that encourages to act on one's own (Wethington & Kessler, 1986). Social-cognitive theory (Bandura, 1997) assumes that the path from support to control beliefs is crucial, and several studies have found anticipated social support to enhance control beliefs, which in turn increase physical and mental QoL (e.g. Bisconti & Bergeman, 1999; Saltzman & Holahan, 2002). Similarly, perceiving to be embedded in a network of potentially helpful others increases self-esteem (Pearlin, Menaghan, Morton, & Mullan, 1981), which in turn enhances both mental (Dunkel-Schetter et al., 1990) and physical QoL (Fry, 2001).

According to the helper therapy principle (Riessman, 1965), *providing* support represents an opportunity to prove independency and reduce feelings of indebtedness (Gleason, Iida, Bolger, & Shrout, 2003), which might be especially important for people with multiple illnesses. Several

studies found that providing support to others promotes personal control (e.g. Krause, Herzog, & Baker, 1992) and self-esteem (Krause & Shaw, 2000). In order to disentangle the effects of providing support on control beliefs and self-esteem, it has been suggested to analyse self-esteem and control beliefs concurrently in one model (Krause et al., 1992).

### *Emotional Support*

Especially in the population of elderly individuals with multiple illnesses, emotional support might be one of the key factors for the analysis of the effects of social interactions on QoL for a number of reasons.

Socioemotional selectivity theory (Carstensen, 1992) assumes that with increasing age, and thus with increasingly limited future time perspective, individuals concentrate on emotionally satisfying relations, which points to the importance of the emotional contents of social interactions. As a higher number of diagnoses is associated with a more limited time perspective (Ziegelmann, Lippke, & Schwarzer, 2006), individuals with multimorbidity should have a more limited time perspective and should therefore have a stronger preference for emotionally meaningful goals. Emotional support might thus be particularly beneficial in this population.

Even if the capabilities of elderly individuals with multiple illnesses to provide *instrumental* support diminish, they are still able to provide emotional support, which does not necessarily require sharing already limited resources (Fortin, et al., 2006; Klein Ikkink & van Tilburg, 1999). In fact, studies found that elderly people were more likely to provide emotional support (e.g., van Tilburg, 1998). As emotional support is more important to elderly and chronically ill people, and because they are more likely engaged in emotional support, emotional support accordingly should be the primary type of support affecting QoL in elderly adults. In line with this, received and anticipated *emotional* support had stronger and more consistent associations with QoL compared to other types of support (e.g. Berkman & Glass, 2000). This suggests examining the effects of emotional support rather than other types of support when looking for resources of QoL in elderly individuals with multiple illnesses.

### *Research Questions*

The first aim of this study is to extend current knowledge by examining not only the impact of anticipated and received, but also providing emotional support on physical and mental QoL in elderly people with multiple illnesses. The second aim is to test for possible mediators that explain *why* different kinds of social interactions have an impact on physical as well as mental QoL.

In particular we hypothesise:

1. Received emotional support is negatively associated with physical and mental QoL. This association is mediated by impairments of self-esteem and control beliefs.
2. Anticipated emotional support is positively associated with physical and mental QoL. This association is mediated by the enhancement of self-esteem and control beliefs.
3. Providing emotional support is positively associated with physical and mental QoL. This association is mediated by the enhancement of self-esteem and control beliefs.

So far, most studies examining providing social support have not controlled for concurrent effects of anticipated and received support. Accordingly, we will control for two social resources when analysing the third as independent variable in each of our analyses.

## Method

### *Participants*

Data come from the second wave of the German Ageing Survey<sup>1</sup> (DEAS) in 2002. DEAS is a representative nation-wide and population-based survey of the community-dwelling adult population between 40 and 85 years (Engstler & Wurm, 2006). DEAS comprises a standardised personal interview and a questionnaire. In total, 3,084 participants took part. For this study, all participants with less than 2 diseases ( $n=1,112$ , 36.1%) and participants with missing values on the disease list were excluded ( $n=309$ , 10.0%). According to Van den Akker's (1998) definition of multimorbidity (co-occurrence of two or more chronic conditions), this left  $n = 1,663$  multimorbid participants in this study. Missing values did not exceed 5% on the study variables, thus listwise deletion was applied. As a result, 1,415 cases were used to perform the analyses for this study.

### *Measures*

*Possible confounders.* Age, gender, place of residence and partner status (all assessed in the interview) were included as control variables because of their known relation to QoL. We further controlled for the number of chronic conditions, physical functioning and depressive symptoms in order to identify unique effects of social interactions on QoL. We also controlled for received, anticipated and providing support, respectively when testing one of them as independent variable.

*Physical health* was measured in the questionnaire by a list of 11 self-reported chronic conditions (e.g. cardiovascular diseases, diabetes, respiratory diseases) summed up to an absolute number of illnesses. The conditions in this list were informed by the Charlson Comorbidity Index

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<sup>1</sup> Instruments and sample descriptions are available online ([www.german-ageing-survey.org](http://www.german-ageing-survey.org)).

(Charlson, Szatrowski, Peterson, & Gold, 1994). *Functional health* was assessed in the interview by the 10-item physical functioning subscale of the SF-36 (Bullinger & Kirchberger, 1998; Cronbach's alpha = .94). Higher scores indicate better physical functioning. *Depressive symptoms* were assessed in the interview with the German 15-item short form of the CES-D scale (Hautzinger & Bailer, 1993). A sum score was built, with a higher score indicating more depressive symptoms (Cronbach's alpha = .88).

#### *Dependent Variables*

*Physical and mental QoL* were assessed in the questionnaire with two subscales of the WHOQOL-BREF (World Health Organization, 1998). The physical facet of QoL comprises seven items (Cronbach's alpha = .85) such as 'To what extent do you feel that physical pain prevents you from doing what you need to do?' The mental facet comprises six items (Cronbach's alpha = .80) such as 'To what extent do you feel your life to be meaningful?' All items were rated on 5-point scales. Domain scores were summed and transformed into two scales; higher scores indicating higher QoL.

#### *Independent Variables and Mediators*

*Received emotional support* was assessed in the interview: 'How often have you been consoled or cheered up in the last 12 months?' on a 4-point scale from 'never' to 'very often'. *Providing emotional support* was also assessed in the interview: 'How often have you cheered up or consoled someone else in the last 12 months?' on the same scale. *Anticipated emotional support* was measured in the questionnaire by two items ( $r = .58, p < .01$ ) of the Loneliness Scale as a proxy (de Jong Gierveld & Kamphuis, 1985): 'There are many people that I can count on completely' and 'I can call on my friends whenever I need them'. Items were rated from (1) 'strongly disagree' to (4) 'strongly agree'.

*Control beliefs* were measured in the questionnaire by ratings of control beliefs for specific domains of life on a 4-point scale from (1) 'almost no influence' to (4) 'a lot of influence'. The stem 'Please indicate the extent to which you believe that you can influence your life in the following areas.' was followed by seven domains: Partnership, family relations, friendships, leisure, health, standard of living and housing (Cronbach's alpha = .80).

*Self-esteem* was assessed in the questionnaire via the Rosenberg Self-Esteem Scale (1965). The 10-item scale has a 4-point response format from (1) 'strongly disagree' to (4) 'strongly agree' (Cronbach's alpha = .81).

### Data Analyses

For estimating direct and indirect effects of multiple mediators in one model, we used the *non-parametric bootstrapping procedure* using a SPSS macro by Preacher & Hayes (2008). Point estimates and confidence intervals (in our study 99%) are estimated for the indirect effects.

Figure 1 shows the multiple mediation model: The total effect ( $c$ ) an independent variable (IV) exerts on a dependent variable (DV) is the sum of a direct effect ( $c'$ ) of the IV on the DV and an indirect effect ( $a*b$ ) of the IV on the DV through a proposed mediator (M), while  $a$  is the effect of IV on M and  $b$  is the effect of M on DV, partialling out the effect of IV. The total indirect effect is the sum of  $a*b$  weights.

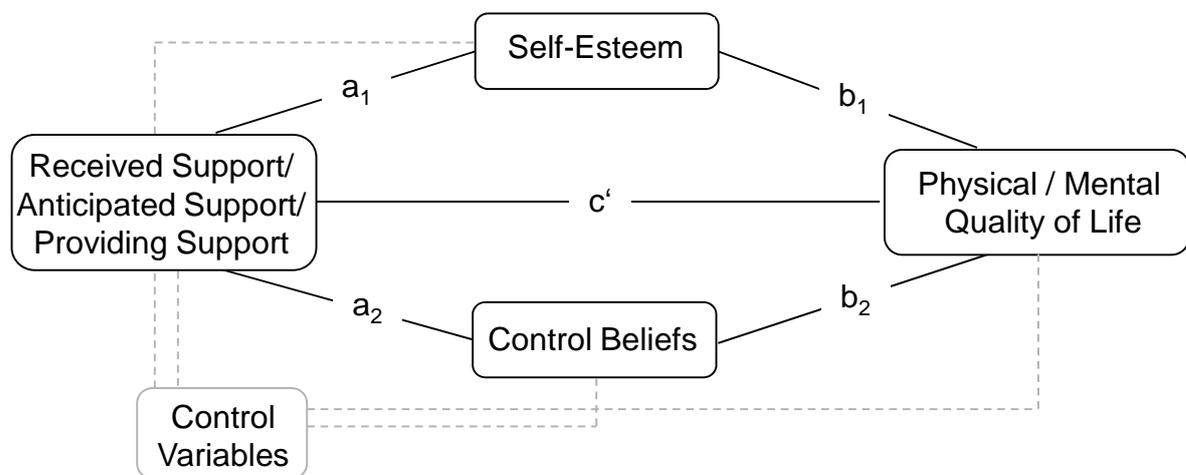


Figure 1. Conceptual representation of the multiple mediation models (for independent and dependent variables see Table 2).

Note. The total effect (weight  $c$ ) is composed of the direct effect (weight  $c'$ ) and the indirect effect (sum of all  $a*b$  weights).

## Results

### Descriptive Results

Descriptive statistics and correlations among the variables are presented in Table 1. Table 1 indicates that the number of chronic conditions was negatively associated with physical and mental QoL. Anticipated and providing support were positively correlated to physical and mental QoL, while received support was negatively correlated to physical and mental QoL. Depressive symptoms and the number of chronic conditions had significant negative correlations with both facets of QoL, whereas physical functioning had significant positive correlations with both facets of QoL. Hence, these variables were also controlled for in the following analyses.

*Emotional Support and Quality of Life*

*Received support and physical QoL.* Received support was negatively associated with physical QoL (c) and self-esteem ( $a_1$ ), but had no significant association with control beliefs ( $a_2$ ). As the total effect (c) remained significant after entering both mediators ( $c'$ ), and the confidence intervals for both indirect effects ( $a*b$ ) included zero, neither self-esteem nor control beliefs can be considered significant mediators in the relation of received support and physical QoL.

*Received support and mental QoL.* Neither self-esteem nor control beliefs significantly mediated the negative association of received support and mental QoL.

*Anticipated support and physical QoL.* Anticipated support was significantly associated with self-esteem and control beliefs. Both mediators also were significantly associated to physical QoL. The total effect of anticipated support on physical QoL became non-significant when the mediators were entered, indicating full mediation. Self-esteem and control beliefs had significant indirect effects. The contrast testing both mediators against each other was not significant, indicating comparable indirect effects.

*Anticipated support and mental QoL.* This multiple mediation also had significant a and b paths. The direct effect was still significant after entering the two mediators, but decreased significantly, indicating partial mediation. Self-esteem and control beliefs both showed significant indirect effects. Self-esteem was a significantly stronger mediator.

*Providing support and physical QoL.* The effects of providing support on both mediators and the effects of both mediators on physical QoL were significant. The total effect decreased when the mediators were entered, but remained significant, indicating partial mediation. Self-esteem and control beliefs had significant and similarly strong indirect effects.

*Providing support and mental QoL.* The last model revealed significant a and b paths. The total effect became non-significant after including the mediators, indicating full mediation. As the contrast was non-significant, both mediators were equally important.

In an additional regression analysis (not depicted here) with all support measures and control variables, self-esteem and control beliefs significantly enhanced the amount of explained variance by 3% (from 58% to 61%) in physical and by 15% (from 43% to 58%) in mental QoL in the last steps.

Table 1. Correlations, Means (*M*), Standard deviations (*SD*), Ranges and Percentages (%).

	1	2	3	4	5	6	7	8	9	10	11	12	13	<i>M</i>	<i>SD</i>	Range
1. Age														64.90	11.80	40-85
2. Sex (1=male, 2=female)	-.02													49.5% male	50.5% female	
3. Region (1=west, 2=east)	.01	.01												66.2% west	33.8% east	
4. Partner Status (1=no partner, 2= partner)	-.20***	-.20***	-.01											32.2% no partner	67.8% partner	
5. Depressive Symptoms	.07**	.10***	.07**	-.17***										8.69	7.02	0-44
6. Number of chronic conditions	.24***	-.05	.01	-.09***	.18***									3.44	1.57	2-11
7. Physical functioning	-.42***	-.13***	-.06*	.19***	-.39***	-.35***								75.87	26.95	0-100
8. Received support	-.09***	.13***	<-.01	.01	.39***	.09***	-.19***							2.43	0.95	1-4
9. Anticipated support	.01	.05*	.01	.10***	-.20***	-.09***	.08 **	-.02						3.05	0.72	1-4
10. Providing support	-.23***	.11***	-.09***	.07**	.02	-.02	.07 **	.32***	.15***					2.17	0.90	1-4
11. Self-esteem	-.01	-.04	-.03	.14***	-.41***	-.14***	.20 ***	-.17***	.33***	.11***				33.08	4.78	1-4
12. Control beliefs	-.17***	-.20***	-.01	.26***	-.30***	-.18***	.28 ***	-.06*	.30***	.16***	.39***			2.79	0.56	10-40
13. Physical Quality of Life	-.30***	-.07**	-.07**	.17***	-.53***	-.37***	.69 ***	-.27***	.19***	.10***	.40***	.38***		68.87	18.75	0-100
14. Mental Quality of Life	-.09***	-.11***	-.05*	.19***	-.60***	-.23***	.34***	-.31***	.35***	.07**	.62***	.45***	.64***	71.33	15.49	0-100

Note. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

## Discussion

This study examined the differential effects of providing, anticipating and receiving emotional support on physical and mental quality of life (QoL) and tested potential mediators of this relation. The study also adds more evidence to the notion that multiple illnesses impair physical and mental QoL.

Our assumption that *received emotional support* is negatively associated with both physical and mental QoL was supported, but control beliefs and self-esteem did not mediate this relation. These results are contrary to social breakdown theory, which posits that negative effects of received support are caused by decreased control beliefs (Bengtson & Kuypers, 1986). Our results can neither support nor falsify the idea that especially in cross-sectional studies, negative associations of received support and QoL are markers of failed individual coping (Bolger et al., 2000; Wethington & Kessler, 1986): Although self-esteem was attenuated by received support, indicating failed coping, this attenuation did not translate into lower levels of QoL. The *mobilisation hypothesis* offers an alternative plausible explanation given the health status of our sample: Here, received support indicates poor health, because health deteriorations mobilise social networks. In addition to this possibly simplistic assumption, other mechanisms, like feelings of guilt, dependence and anxiety have been suggested to explain negative effects of received social support (Bolger et al., 2000; Silverstein, Xuan, & Heller, 1996), and should be addressed in future research.

Our study provides further support for the hypotheses deducted from social cognitive theory, as *anticipated emotional support* had positive effects on self-esteem and control beliefs, which in turn promoted physical and mental QoL. Self-esteem was a significantly stronger mediator than control beliefs in predicting mental QoL from anticipated support. This could be explained by the idea that perceptions of others (such as the anticipation of support) are closely linked to perceptions of the self such as self-esteem (Brand, Lakey, & Berman, 1995).

*Providing emotional support* was positively associated with self-esteem and control beliefs, which led to higher physical and mental QoL. In accordance to studies that related control beliefs and self-esteem to providing support (Krause et al., 1992; Krause & Shaw, 2000), we found that both factors play an equally important role in translating helping into benefits for the helper. These findings also support the helper therapy principle (Riessman, 1965).

In terms of effect sizes, anticipated emotional support was most closely linked to self-esteem, control beliefs and both facets of QoL, followed by received emotional support and providing emotional support. It is further noticeable that self-esteem had stronger relations to the

independent variables, whereas control beliefs were stronger correlated to the outcomes in all models. This pattern suggests a sequence in which anticipated and providing support lead to self-esteem, which in turn enhances control beliefs, finally resulting in higher levels of QoL. The challenge of testing this sequence remains for future longitudinal and experimental research.

#### *Limitations, Strengths and Suggestions for Future Research*

Due to the cross-sectional design, alternative explanations of our results are possible. Individuals who are physically and mentally more robust could experience higher QoL, leading to higher self-esteem and control beliefs, which in turn would enable them to provide and anticipate more emotional support (Brown et al., 2003). Additionally, individuals who report lower mental and physical QoL might receive more emotional support from their networks (Brown et al., 2003). To identify the unique effects of social interactions on QoL instead of the effects of impairments in QoL on social interactions, we controlled for the number of chronic conditions, physical functioning and depressive symptoms, which additionally evoked a conceptual overlap between some dependent and independent variables (e.g., physical functioning and physical QoL).

Multimorbidity was operationalised as an illness count with a disease list informed by the Charlson Comorbidity Index (Charlson et al., 1994). While this leads to comparability between individuals, it leaves out interindividual differences in subjective severity of illnesses and differential effects of specific illnesses or illness combinations. Future research might consider including multimorbidity measures weighted in terms of functional impairments.

Our study focused on emotional support only. Future research might want to test the effects of receiving, anticipating and providing of other types of social support, e.g., *instrumental* or *informational* support on QoL, or include measures of size, composition and reciprocity of networks and the sources of support to provide a broader view on social influences.

Anticipated support was operationalised by two items of the Loneliness Scale (de Jong Gierveld & Kamphuis, 1985). Although the items describe anticipated support, and although the scale has been used to assess anticipated support in previous studies (Bisschop et al., 2004), specific measures of anticipated support would be preferable.

According to Social Exchange Theory, providing and receiving social support should be balanced to maintain autonomy (Dowd, 1975). To test for the balance in providing and receiving social support in individuals with multiple morbidities remains an important research question for future studies.

Table 2. Summary of Results for six Multiple Mediation Models

Independent Variable (IV)	Dependent Variable (DV)	Mediating variables (M)	Effect of IV on M (a)	Effect of M on DV (b)	Total effect (c)	Direct effect (c')	Indirect effects (a*b)	Lower BC 99% CI for a*b	Higher BC 99% CI for a*b	Contrast of mediators	Lower BC 99% CI for contrast	Higher BC 99% CI for contrast
Received support	Physical Quality of Life	Self-esteem	-0.30*	0.55***	-1.63***	-1.50***	-0.16	-0.40	0.02	-0.20	-0.43	0.02
		Control beliefs	0.01	3.35***			0.03	-0.12	0.20			
Received support	Mental Quality of Life	Self-esteem	-0.30*	1.29***	-2.00***	-1.66***	-0.38	-0.86	0.05	-0.42	-0.87	<0.01
		Control beliefs	0.01	3.85***			0.04	-0.13	0.24			
Anticipated support	Physical Quality of Life	Self-esteem	1.67***	0.55***	2.15***	0.62	0.92 <sup>a</sup>	0.48	1.45	0.32	-0.36	1.01
		Control beliefs	0.18***	3.35***			0.61 <sup>a</sup>	0.28	1.04			
Anticipated support	Mental Quality of Life	Self-esteem	1.67***	1.29***	5.05***	2.20***	2.16 <sup>a</sup>	1.48	2.94	1.47 <sup>a</sup>	0.63	2.37
		Control beliefs	0.18***	3.85***			0.69 <sup>a</sup>	0.35	1.13			
Providing support	Physical Quality of Life	Self-esteem	0.48***	0.55***	1.27***	0.82*	0.26 <sup>a</sup>	0.08	0.53	0.09	-0.19	0.38
		Control beliefs	0.05***	3.35***			0.18 <sup>a</sup>	0.05	0.39			
Providing support	Mental Quality of Life	Self-esteem	0.48***	1.29***	0.91**	0.09	0.62 <sup>a</sup>	0.18	1.12	0.42	-0.04	0.89
		Control-beliefs	0.05***	3.85***			0.20 <sup>a</sup>	0.05	0.42			

Note. Reported are unstandardised regression coefficients; <sup>a</sup> = significant point estimate according to 99% bias corrected (BC) bootstrapping confidence interval (CI);  $N = 1,415$ ; \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

A strength of our study is the fact that we controlled for the influence of receiving, anticipating and providing support respectively when testing one of them as independent variable. This increases the likelihood of detecting differential effects for different facets of social support, ruling out the possibility that mere contact to other people is the active ingredient leading to benefits in QoL.

### *Practical Implications and Conclusions*

The findings from this study bear several implications for practice. Bolger et al. (2000) found that the detrimental effects of *receiving* support may be attenuated if it remains *invisible* to the recipient. This subliminal support may operate by leading recipients to think they solved the problem on their own, or by highlighting recipient's positive attributes instead of drawing attention to failed coping.

*Anticipated* support has often been found to be a better predictor of adjustment to illness and well-being than actual support exchanges (e.g. Brand et al., 1995). Thus, changing a person's social environments is not the first choice of interventions to ensure positive outcomes. It has been suggested to target self-perceptions instead, which in turn enable participants to interpret social interactions more positively and accordingly increase their anticipated support (Brand et al., 1995). If modifications in social environments seem necessary nevertheless, such changes should account for age-related tendencies to prioritise emotionally meaningful social partners over acquaintances or novel social partners as outlined in Socioemotional Selectivity Theory (Carstensen, 1992).

Our results add to a growing body of research that documents the benefits of *providing* support to others (e.g. Brown et al., 2003; Schwartz et al., 2003). A successful intervention based on this principle was developed by Schwartz and Sendor (1999). In comparison to the patient-group that received no training, but received support from trained individuals, the group which provided support was better adjusted to multiple sclerosis. However, we would not unconditionally recommend interventions to educate chronically ill individuals to give as much support as they can, because helping might also cause frustration, burden and excessive demands (e.g. Lu & Argyle, 1992; Schwartz et al., 2003). Therefore, it has to be ensured that the provision of support, especially in chronically ill individuals with restricted resources is realistic (Schwartz & Sendor, 1999). Based on the results of our study, only the provision of *emotional* support can be recommended.

Our study took a first step in disentangling the association between QoL and different social resources in multimorbid individuals from a nationally representative survey. In examining the

provision of emotional support in addition to the effects of received and anticipated emotional support, we have contributed to reveal a further facet of a very important resource for chronically ill persons – social support.

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### **References**

- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman.
- Bengtson, V. L., & Kuypers, J. A. (1986). The family support cycle: Psycho-social issues in the aging family. In P. M. J. M. A. Munnichs, & E. Olbrich (Ed.), *Life span and change in a gerontological perspective* (pp. 61-77). New York: Academic Press.
- Berkman, L. F., & Glass, T. (2000). Social integration, social networks, social support, and health. In L. F. Berkman & I. Kawachi (Eds.), *Social Epidemiology* (pp. 137-173). New York, NY: Oxford University Press Inc.
- Bisconti, T. L., & Bergeman, C. S. (1999). Perceived social control as a mediator of the relationships among social support, psychological well-being, and perceived health. *Gerontologist*, 39(1), 94-103.
- Bisschop, M. I., Kriegsman, D. M. W., Beekman, A. T. F., & Deeg, D. J. H. (2004). Chronic diseases and depression: The modifying role of psychosocial resources. *Social Science & Medicine*, 59(4), 721-733.
- Bolger, N., Zuckerman, A., & Kessler, R. C. (2000). Invisible support and adjustment to stress. *Journal of Personality and Social Psychology*, 79(6), 953-961.
- Brand, E. F., Lakey, B., & Berman, S. (1995). A preventive, psychoeducational approach to increase perceived social support. *American Journal of Community Psychology*, 23(1), 117-135.
- Brown, S. L., Nesse, R. M., Vinokur, A. D., & Smith, D. M. (2003). Providing social support may be more beneficial than receiving it: Results from a prospective study of mortality. *Psychological Science*, 14(4), 320-327.
- Bullinger, M., & Kirchberger, I. (1998). *SF-36 Fragebogen zum Gesundheitszustand*. Göttingen: Hogrefe.
- Carstensen, L. L. (1992). Social and emotional patterns in adulthood: Support for socioemotional selectivity theory. *Psychology and Aging*, 7(3), 331-338.

- Charlson, M. E., Szatrowski, T. P., Peterson, J., & Gold, J. (1994). Validation of a combined comorbidity index. *Journal of Clinical Epidemiology*, *47*(11), 1245-1251.
- de Jong Gierveld, J., & Kamphuis, F. H. (1985). The development of a Rasch-type loneliness-scale. *Applied Psychological Measurement*, *9*, 289-299.
- Dowd, J. J. (1975). Aging as Exchange: A Preface to Theory. *Journal of Gerontology*, *30*(5), 584-594.
- Dunkel-Schetter, C., Bennett, T. L., Sarason, B. R., Sarason, I. G., & Pierce, G. R. (1990). Differentiating the cognitive and behavioral aspects of social support. In *Social support: An interactional view*. (pp. 267-296). Oxford England: John Wiley & Sons.
- Engstler, H., & Wurm, S. (2006). Datengrundlagen und Methodik [Data and methods]. In C. Tesch-Römer, H. Engstler & S. Wurm (Eds.), *Altwerden in Deutschland: Sozialer Wandel und individuelle Entwicklungen in der zweiten Lebenshälfte* (pp. 47-83). Wiesbaden, Germany: VS Verlag.
- Fortin, M., Bravo, G., Hudon, C., Lapointe, L., Almirall, J., Dubois, M.-F., et al. (2006). Relationship between multimorbidity and health-related quality of life of patients in primary care. *Quality of Life Research*, *15*(1), 83-91.
- Fortin, M., Lapointe, L., Hudon, C., Vanasse, A., Ntetu, A. L., & Maltais, D. (2004). Multimorbidity and quality of life in primary care: a systematic review. *Health and Quality of Life Outcomes*, *2*(51). doi: 10.1186/1477-7525-2-51
- Frijters, P., Haisken-DeNew, J. P., & Shields, M. A. (2003). Investigating the Patterns and Determinants of Life Satisfaction in Germany Following Reunification. *Journal of Human Resources*, *39*(3), 649-674.
- Fry, P. S. (2001). Predictors of health-related quality of life perspectives, self-esteem, and life satisfactions of older adults following spousal loss: an 18-month follow-up study of widows and widowers. *Gerontologist*, *41*(6), 787-798.
- Gijzen, R., Hoeymans, N., Schellevis, F. G., Ruwaard, D., Satariano, W. A., & van den Bos, G. A. (2001). Causes and consequences of comorbidity: a review. *Journal of Clinical Epidemiology*, *54*(7), 661-674.
- Gleason, M. E. J., Iida, M., Bolger, N., & Shrout, P. E. (2003). Daily supportive equity in close relationships. *Personality & Social Psychology Bulletin*, *29*(8), 1036-1045.
- Hautzinger, M., & Bailer, M. (1993). *Allgemeine Depressions-Skala. Manual*. Göttingen: Beltz Test GmbH.
- Klein Ikkink, K., & van Tilburg, T. (1999). Broken ties: Reciprocity and other factors affecting the termination of older adults' relationships. *Social Networks*, *21*(2), 131-146.
- Krause, N., Herzog, A. R., & Baker, E. (1992). Providing support to others and well-being in later life. *Journals of Gerontology*, *47*(5), 300-311.
- Krause, N., & Shaw, B. A. (2000). Giving social support to others, socioeconomic status, and changes in self-esteem in late life. *Journals of Gerontology Series B: Psychological Sciences & Social Sciences*, *55B*(6), 323-333.

- Kriegsman, D. M. W., Penninx, B. W. H. J., & van Eijk, J. T. M. (1995). A criterion-based literature survey of the relationship between family support and incidence and course of chronic disease in the elderly. *Family Systems Medicine, 13*(1), 39-68.
- Kuijer, R. G., Buunk, B. P., & Ybema, J. F. (2001). Are equity concerns important in the intimate relationship when one partner of a couple has cancer? *Social Psychology Quarterly, 64*(3), 267-282.
- Lu, L., & Argyle, M. (1992). Receiving and giving support: Effects on relationships and well-being. *Counselling Psychology Quarterly, 5*(2), 123.
- MacKinnon, D. P. (2000). Contrasts in multiple mediator models. In L. C. J. Rose, C. C. Presson, & S. J. Sherman (Ed.), *Multivariate applications in substance use research: New methods for new questions* (pp. 141-160). Mahwah, NJ: Erlbaum.
- Mankowski, E. S., & Wyer, R. S., Jr. (1997). Cognitive causes and consequences of perceived social support. In G. R. Pierce, B. Lakey, I. G. Sarason & B. R. Sarason (Eds.), *Sourcebook of social support and personality*. (pp. 141-165). New York, NY US: Plenum Press.
- Newsom, J. T., & Schulz, R. (1998). Caregiving from the recipient's perspective: Negative reactions to being helped. *Health Psychology, 17*(2), 172-181.
- Pearlin, L. I., Menaghan, E. G., Morton, A. L., & Mullan, J. T. (1981). The Stress Process. *Journal of Health and Social Behavior, 22*(4), 337-356.
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*(3), 879-891.
- Revenson, T. A., Wollman, C. A., & Felton, B. J. (1983). Social supports as stress buffers for adult cancer patients. *Psychosomatic Medicine, 45*(4), 321-331.
- Riessman, F. (1965). The "Helper" Therapy Principle. *Social Work, 10*(2), 27-32.
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.
- Saltzman, K. M., & Holahan, C. J. (2002). Social support, self-efficacy and depressive symptoms: An integrative model. *Journal of Social & Clinical Psychology, 21*(3), 309-322.
- Sarason, I. G., Levine, H. M., Basham, R. B., & Sarason, B. R. (1983). Assessing social support: The Social Support Questionnaire. *Journal of Personality and Social Psychology, 44*(1), 127-139.
- Schwartz, C., Meisenhelder, J. B., Ma, Y., & Reed, G. (2003). Altruistic social interest behaviors are associated with better mental health. *Psychosomatic Medicine, 65*(5), 778-785.
- Schwartz, C., & Sendor, M. (1999). Helping others helps oneself: Response shift effects in peer support. *Social Science & Medicine, 48*(11), 175-188.
- Schwarzer, R., & Knoll, N. (2007). Functional roles of social support within the stress and coping process: A theoretical and empirical overview. *International Journal of Psychology, 42*(4), 243-252.
- Schwarzer, R., & Leppin, A. (1991). Social support and health: A theoretical and empirical overview. *Journal of Social and Personal Relationships, 8*(1), 99-127.

- Silverstein, M., Xuan, C., & Heller, K. (1996). Too much of a good thing? Intergenerational social support and the psychological well-being of older parents. *Journal of Marriage & Family*, 58(4), 970-982.
- van den Akker, M., Buntinx, F., & Knottnerus, J. A. (1996). Comorbidity or multimorbidity: what's in a name? A review of literature. *European Journal of General Practice*, 2(2), 65-70.
- van den Akker, M., Buntinx, F., Metsemakers, J. F., Roos, S., & Knottnerus, J. A. (1998). Multimorbidity in general practice: prevalence, incidence, and determinants of co-occurring chronic and recurrent diseases. *Journal of Clinical Epidemiology*, 51(5), 367-375.
- van Tilburg, T. (1998). Losing and gaining in old age: Changes in personal network size and social support in a four-year longitudinal study. *Journals of Gerontology: Series B: Psychological Sciences and Social Sciences*, 53(6), 313-323.
- Wethington, E., & Kessler, R. C. (1986). Perceived support, received support, and adjustment to stressful life events. *Journal of Health and Social Behavior*, 27(1), 78-89.
- World Health Organization. (1998). *WHOQOL user manual*. Geneva: WHO.
- Ziegelmann, J. P., Lippke, S., & Schwarzer, R. (2006). Subjective residual life expectancy in health self-regulation. *Journals of Gerontology: Series B: Psychological Sciences and Social Sciences*, 61(4), 195-201.

# 3

## Maintaining Autonomy despite Multimorbidity: Self-Efficacy and the two Faces of Social Support

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### **Abstract**

Multimorbidity – the co-occurrence of multiple illnesses – is a frequent condition in older adults and poses serious threats to autonomy. In order to identify resources for autonomy despite multimorbidity, our longitudinal study tested main and interaction effects of personal and social resources (self-efficacy and social support) on maintaining autonomy. Three hundred and nine individuals (aged 65-85 years) with multiple illnesses completed measures of self-efficacy beliefs, received instrumental social support and perceptions of autonomy. Data were analyzed using structural equation modeling. Cross-sectionally, individuals with lower perceptions of autonomy received more support from their networks. Longitudinally, the relation of received support with autonomy was moderated by self-efficacy: Simple slopes analyses showed that social support compensated for lower levels of self-efficacy, whereas in individuals with higher self-efficacy the resources interfered.

Receiving social support bolstered autonomy in lower self-efficacious individuals, but in highly self-efficacious individuals support threatened autonomy. This has implications for both theory and practice, as it suggests differential effects of social resources depending on personal resources.

*Keywords:*

autonomy, self-efficacy, received instrumental social support, multimorbidity, old age

## Introduction

Chronic illnesses have serious consequences for older people's lives. Difficulties in maintaining social roles or valued activities and increasing dependency on others threaten perceptions of autonomy. The challenge to maintain autonomy in old age is even greater for people with multiple chronic conditions (multimorbidity). Therefore, this study aims at identifying personal and social resources that help to maintain autonomy despite multimorbidity.

### *Perceived Autonomy*

Autonomy is a fundamental and universal psychological need (Ryan and Deci 2000). According to Ryan and Deci (2006), autonomy is primarily defined as the "experience of choice". Such perceptions of autonomy are related to satisfaction with life, positive mood, vitality and well-being (Hertz and Anschutz 2002; Matsui and Capezuti 2008; Reis et al. 2000; Zissi et al. 1998). However, the ability to experience choices in one's life is challenged by developmental tasks that inevitably accompany the aging process. Besides being confronted with the feeling of time running out and the experience of social stressors such as the loss of social roles (e.g., as a result of retirement), the most severe threats to autonomy in age are physical losses and biological impairments (Baltes and Silverberg 1994). With increasing age, chronic physical conditions often accumulate and result in multimorbidity – the co-occurrence of two or more chronic conditions at a time (van den Akker et al. 1998). Older people affected by multimorbidity report more frequent health care utilization, longer hospital stays, treatment complications, medication interactions and declines in mental quality of life (Fortin et al. 2004; Gijsen et al. 2001). However, the strongest threats to autonomy in chronically ill persons are rapidly accelerating functional limitations, which limit the freedom of acting on one's own and cause disability and dependence (Sibley et al. 2006). Such functional losses that accompany the aging process have for several decades been the primary focus of aging research. Only in the last years, this "one-way" perspective of aging has been replaced by an interactive viewpoint (Baltes 1995). Lifespan psychology has moved away from seeing the aging process as a phase primarily characterized by losses and suggests that persons and their environments constitute reciprocal systems of action (Wahl 1991). By adopting this interactive perspective, it becomes evident that the interplay of social and personal resources is crucial for understanding how autonomy can be maintained despite multimorbidity and the accompanying health problems. This interplay of personal and social resources is immanent in Ryan and Deci's (2006) definition of autonomy. According to Ryan and Deci, aging individuals are autonomous if

they have a *choice* of actions, i.e., can decide on every day activities and the course of their lives, even if this requires help from others. This notion also emphasizes that autonomy is something that is perceived by an individual and goes beyond mere functional status.

The idea that autonomy is characterized by having a choice means that it can be adaptive for the maintenance of autonomy in old age to delegate actions that are *perceived* to be unrealistic to perform on one's own. The important point here is an individual's *perception* whether an action can still be performed unassisted or not. This belief in the capability to perform a specific action required to attain a desired outcome is known as perceived *self-efficacy* – an important personal resource factor.

#### *Perceived Self-Efficacy*

According to Social Cognitive Theory (Bandura 1997), human motivation and actions are regulated extensively by forethought. One of the prime factors that affect behavior is perceived self-efficacy, that is, people's beliefs in their capabilities to produce certain effects by their actions. The construct is usually understood as being either task-specific or domain-specific and usually, specific self-efficacy beliefs predict specific outcomes best (Bandura 1997). However, some researchers have also conceptualized a generalized belief of self-efficacy that refers to a broad and stable sense of personal competence to master a variety of stressful situations (Schwarzer and Jerusalem 1995). General self-efficacy was found to be valid across various cultures (Luszczynska et al. 2005b) and to be rather stable across time, which is the reason it is conceptualized to be a trait-like rather than a state-like construct (Chen et al. 2000). This broad self-efficacy concept may explain a wider range of human behaviors and coping outcomes when the context is less specific. It is useful when looking for resources of multiple behavior changes simultaneously (Luszczynska et al. 2004) or when studying the well-being or behavior of patients who have to adjust their life to multiple demands due to illness (Bonetti et al. 2001).

Even though it was found that general self-efficacy beliefs slowly decrease with age and with the incidence of chronic diseases (Endler et al. 2001; Steverink et al. 2005), individuals who have stronger general self-efficacy beliefs show better adjustment to medical conditions, e.g., cancer (Schwarzer et al. 2005), or rehabilitation from heart surgery (Schröder et al. 1998) and are less likely to develop disabilities (see Disablement Process Model; Fauth et al. 2007). General self-efficacy was further found to be related to the performance of health behaviors (Luszczynska et al. 2005a), to perceived functional ability in older and chronically ill adults and to control perceptions for multiple illnesses (Schüz et al. in press; Seeman et al. 1999). Hence, a general sense of self-

efficacy can be considered a resource for the adaptation to multiple chronic conditions. Chronic conditions, however, often activate social networks that try to provide social support – regardless of whether it was requested – to ensure that the ill person receives the help the network members consider necessary (Smith and Goodnow 1999).

### *Social Support*

Social support refers to the function and quality of social relationships. Social support has been differentiated into instrumental (e.g., practically assisting with a problem, donating goods), informational (e.g., giving advice), and emotional (e.g., giving reassurance) support. Another important distinction is made between support *received* in the past and support *perceived* or *anticipated* as available in general (Schwarzer and Knoll 2007). *Received* support refers to an individual's recall of support obtained within a given time span in the past. In contrast, *anticipated* support is an individual's perception of support available if needed. Our study focuses on received social support only. However, it is essential to bear in mind that received support and anticipated support do not necessarily need to have much in common (Haber et al. 2007). Expecting support in the future resembles a personality disposition related to optimism and self-worth and is often positively related to health and well-being in older adults (Sarason et al. 1983), whereas support received in the past is based on the recall of actual personal experiences, and in particular instrumental support is an important resource for the maintenance of autonomy in chronically ill patients (Proot et al. 2000; Proot et al. 2007; Williams et al. 1998). However, besides such positive effects, received social support can also have negative effects on both well-being and physical health in older and chronically ill adults (Brown and Vinokur 2003; Hays et al. 1997; Schwarzer and Leppin 1991; Seeman et al. 1996; Cohen et al. 2005). As both the aged and the chronically ill are often met with supporting behavior provided by others, even if they have not directly sought assistance, receiving support may even pose a threat to autonomy (Reich and Zautra 1995; Smith and Goodnow 1999; Zautra et al. 1995; Baltes and Wahl 1992). Therefore, further investigation of the circumstances that render receiving support a threat to autonomy is necessary.

Such two faces of received social support can be explained by several theories: The *mobilization hypothesis* postulates that receiving support does not cause losses of health and well-being, but that existing losses of physical or mental health cause social networks to provide more social support. This hypothesis explains cross-sectional findings of negative relations of received support and adjustment to illness, whereas it predicts time-lagged beneficial effects of receiving support to

be found in longitudinal data (Silverstein et al. 1996; Barrera 1986; Schwarzer and Leppin 1991; Ringdal et al. 2007).

Besides the mobilization hypothesis describing methodological artifacts, however, there are theories that link received social support to *negative* outcomes: *Reactance theory* for example assumes that the major problem for recipients of help is a perceived restriction of freedom (Brehm and Cole 1966). *Social breakdown theory* assumes an increase of feelings of dependency and an erosion of personal competencies through being assisted in older ages (Bengtson and Kuypers 1985). Other authors assume that individuals first try to resolve problems on their own, and only if their personal resources are ineffective, they seek help from others. Accordingly, individuals can perceive received support as a marker of failed coping efforts, which will encourage recipients to adopt the external view that they are dependent on their networks (Revenson et al. 1983; Wethington and Kessler 1986). In summary, these theories assume that receiving external assistance may erode individuals' personal resources. However, research on the interplay of personal and social resources has shown that these approaches do not represent the whole picture. The mechanism between receiving support, personal resources and detrimental outcomes is not a one-way street as personal and social resources also interact with each other (Schröder 1997). Therefore, two further possible explanations for adverse effects of receiving support were postulated that stress the possible interactions of personal and social resources: The *interference* and the *compensation hypothesis* (Schröder 1997).

The *interference hypothesis* posits that it is crucial to take personal resources into account when trying to understand the impact of social resources (Schröder 1997). The hypothesis claims that receiving social support threatens the adjustment to illness in individuals higher in self-efficacy, in particular if this support was unrequested. Research has accordingly found that after heart surgery, patients higher in self-efficacy and social support reported higher illness-related sorrows as well as worse eating habits than those higher in self-efficacy but lower in social support (Schröder 1997). Similarly, physically disabled older recipients of help with high control beliefs preferred to receive less support than recipients with lower levels of perceived control (Newsom and Schulz 1998).

For individuals with lower self-efficacy, the *compensation hypothesis* predicts beneficial effects of receiving social support (Schröder 1997). The compensatory effect of social support is in line with Ryan and Deci's (2006) definition of autonomy that perceived lacks of personal resources can be compensated by social resources. Accordingly, individuals low in self-efficacy were more likely to

engage in compensation in order to maintain autonomy and cope with health problems such as cancer (Aymanns 1992), rheumatoid arthritis (Reich and Zautra 1995) or recovery from heart surgery (Schröder 1997).

#### *Aims of the Study*

In the present study, autonomy is defined as the perception of being independent from others as well as the possession of freedom of choice in everyday life (Ryff, 1995). We assume that self-efficacy and received instrumental social support are core personal and social resources for the perceptions of autonomy in older individuals with multiple medical conditions. We predict that cross-sectionally, participants' perception of low autonomy is related to more social support (mobilization approach), whereas longitudinally it depends on the level of self-efficacy, whether receiving instrumental support helps to maintain autonomy (compensatory approach) or threatens autonomy (interference approach).

## **Method**

#### *Participants and Procedure*

Participants for the PREFER (Personal Resources of Elderly People with Multimorbidity: Fortification of Effective Health Behaviour) study were recruited from the third assessment wave of the German Ageing Survey (DEAS, Wurm et al. 2010), a population-representative survey of adults aged 40 and over, with a total N of 8,200. The third wave of the DEAS took part from July to September 2008 and served as recruitment pool and baseline assessment (Time 0) for the PREFER study. DEAS participants were considered eligible to be contacted for the PREFER study if they were a) 65 years or older, b) suffered from at least two chronic physical conditions mentioned either in the Charlson Comorbidity Index (Charlson et al. 1994) or the Functional Comorbidity Index (Groll et al. 2005) and c) had given consent to be contacted for further studies.

Of a total eligible  $n=443$  participants,  $n=309$  (69.7 %) provided informed consent and made an appointment for the first point of measurement in PREFER (Time 1, March 2009). Participants were visited at their homes by trained interviewers, completed a 30-minute personal interview and additionally completed a questionnaire with a prepaid return envelope. The second point of measurement (Time 2, June 2009) was a questionnaire only that was completed and sent back in a prepaid envelope by  $n=252$  (81.55% of Time 1). The period of 3 months was assumed to be sufficient to observe changes in perceptions of autonomy due to the rapidly changing health status of adults over the age of 65 with multiple chronic conditions (Fortin et al. 2004; Librero et al.

1999). Table 1 provides information on participants' age and sex. Participants had on average 5.49 chronic conditions ( $SD=2.86$ ).

### *Measures*

Perceived Autonomy was assessed with four items of the Perceived Autonomy in Old Age scale (Schwarzer 2008). A pilot study in  $N = 110$  individuals aged 65 and older revealed the following four items to be best-discriminating: (a) I organize my life according to my own ideas, (b) I make my own decisions and don't allow others to protect me, (c) I live by my own choices now that I am old, (d) I cope with my daily life without outside help. Items are rated from (1) 'strongly disagree' to (4) 'strongly agree'. In the pilot study, the scale had a Cronbach's alpha of .91 and discriminant validity was demonstrated by low correlations with the Overprotection scale  $r = .11$  (Thompson and Sobolew-Shubin 1993), limitations in Activities of Daily Living  $r = -.14$  (Lawton and Brody 1969) and with the Satisfaction with Life scale  $r = .07$  (Pavot et al. 1991). Also considering the moderate correlations of  $r = .20$  and  $r = .25$  with the EuroQoL EQ5D questionnaire (Greiner et al. 2003) in this study, the Perceived Autonomy in Old Age (Schwarzer 2008) scale operationalizes participants' subjective evaluation of independence and freedom of choice and clearly discriminates from related constructs as intended by the author. In this study, Cronbach's alpha for the four items of perceived autonomy in old age was .82 at Time 1 and Time 2 as well.

General self-efficacy was assessed at T0 with the German five-item short form of the General Self-efficacy scale (Schwarzer and Jerusalem 1995). The items were a) It is easy for me to stick to my aims and accomplish my goals, b) I can usually handle whatever comes my way, c) I can solve most problems if I invest the necessary effort, d) When I am confronted with a problem, I can usually find several solutions, e) If I am in trouble, I can usually think of a solution. Possible responses ranged from (1) 'strongly disagree' to (4) 'strongly agree'. The short scale had a Cronbach's alpha of .75. General self-efficacy was assessed at Time 0 only, as it is a stable trait rather than a state-like construct (Chen et al. 2000).

To assess received instrumental support at Time 1, two items from the Berlin Social Support Scales (Luszczynska et al. 2007; Schwarzer and Schulz 2000; Schulz and Schwarzer 2003) were applied. The items were: If you think of the last three months, what have persons close to you (partner, children, friends, acquaintances) done for you? Persons close to me... a) took care of many things for me, b) took care of things I could not handle on my own. Participants rated the frequency with which they received instrumental support on a four-point scale from (1) '(almost) never' to (4) '(almost) always'. The items correlated to .60.

Table 1. Means, Standard Deviations, Ranges, and Correlations.

	<i>M</i>	<i>SD</i>	<i>Range</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>
15. Age	73.27	5.10	65-85						
16. Sex (1=men, 2=women)	58% male	42% female		-.09					
17. T2 EQ5D	78.44	13.87	25.9-97.7	-.03	-.20**				
18. T0 perceived self-efficacy	3.01	0.45	1.5-4	<.01	-.06	.15*			
19. T1 instrumental support	2.21	0.92	1-4	.19**	.21***	-.18**	<.01		
20. T1 perceived autonomy	3.43	0.57	1-4	<-.01	<.01	.20**	.20***	-.24***	
21. T2 perceived autonomy	3.42	0.52	2-4	.13*	<.01	.25***	.27***	-.08	.58***

Note. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

Functional health as a covariate was assessed at Time 2. Functional health was measured with the German version of the EuroQol EQ5D (Schulenburg et al. 1998). The EQ5D has five dimensions (1) mobility, (2) self-care, (3) usual activities, (4) pain/discomfort and (5) anxiety/depression that are rated on a 3-point scale ranging from “no problems” to “extreme problems”. Answers were converted to a weighted health status index using European norm weights and the procedure described in the EQ5D manual (Greiner et al. 2003). In our sample, the index ranged from 25.86 to 97.66, with higher scores indicating better quality of life.

#### *Analytic Procedure*

Descriptive data analysis and Pearson correlations were carried out with SPSS 18.0. Data were further analyzed with structural equation modeling using Mplus 5.21. The moderator effect of self-efficacy was tested by comparing a model with a latent interaction term to one without. The Latent Moderated Structural Equation (LMS) approach by Klein and Moosbrugger (2000) was applied to examine the latent interaction. As commonly used fit indices (e.g., CFI, RMSEA, SRMR) cannot be estimated in the LMS approach and the two models were not nested, the Bayesian Information Criterion (BIC) and the Akaike Information Criterion (AIC) were used to assess improvement in fit with lower BIC and AIC values indicative of better fit (Tabachnick and Fidell 2007). No variable had a skewness or kurtosis larger than a value of 2 (Curran et al. 1996). Missing data (not exceeding 20% on any variable) were treated using Full Information Maximum Likelihood in the structural equation model without interaction term and listwise deletion in the LMS model with interaction term.

We tested for measurement invariance of the perceived autonomy scale in order to ensure that it measured the same attributes on the two measurement occasions. Chi-square nested model comparisons suggested that strict invariance was not given, as the strict invariance model fitted the data significantly worse than the strong invariance model ( $\Delta\chi^2(4) = 12.9, p < .05$ ). However, we could assume weak and strong measurement invariance, as the weak invariance model did not fit the data significantly worse than the baseline model ( $\Delta\chi^2(6) = 4.03, n.s.$ ), and the strong invariance model did not fit the data worse than the weak invariance model ( $\Delta\chi^2(4) = 8.56, n.s.$ ), which allowed assuming that the autonomy factors represent the same construct over time.

## Results

### Descriptive Statistics

Descriptive statistics are reported in Table 1. Women and older participants reported receiving more instrumental support, but sex and age made no difference for the perception of self-efficacy. Self-efficacy beliefs were positively correlated with autonomy at Time 1 and Time 2 and had no relation to received instrumental support. Received instrumental support at Time 1 was negatively associated with autonomy at Time 1, but showed no significant correlation with autonomy at Time 2.

### Structural Equation Models

After testing for measurement invariance, we specified two structural equation models that both included age, sex and functional health as covariates and received instrumental support as well as self-efficacy beliefs as predictors for perceived autonomy at Time 1 and Time 2. In the second model, we additionally specified an interaction term of self-efficacy and received instrumental support as predictor of autonomy at Time 2. The residuals for each indicator of autonomy were allowed to auto-correlate over time.

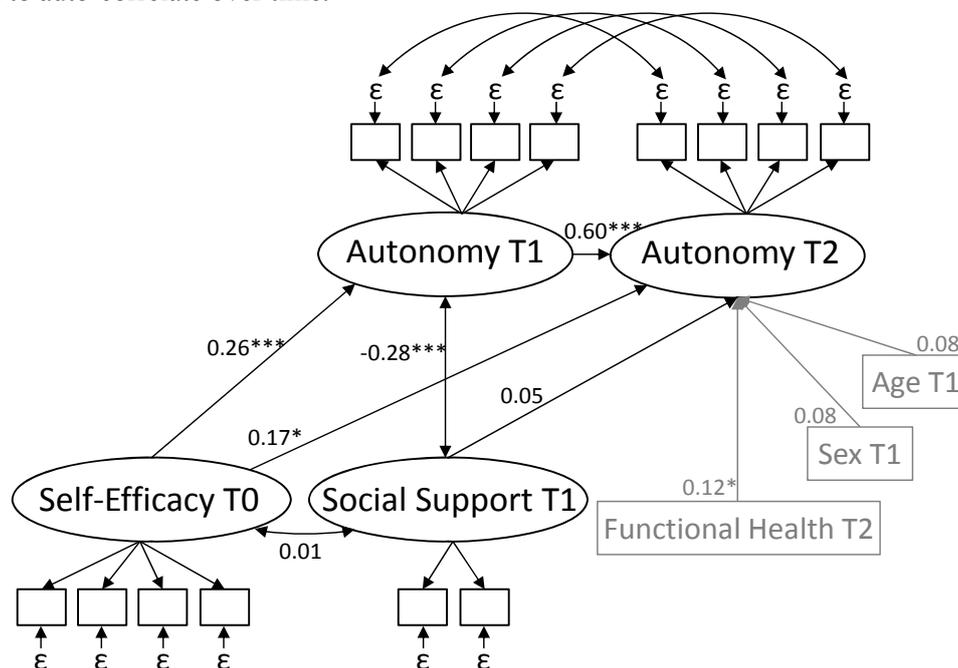


Figure 1. Structural Equation Model without Interaction Term.

Note. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ . Reported are standardized coefficients. Covariates were Age, sex and functional health. T0=baseline, T1=Time 1, T2=Time 2.

The model without interaction had a fair fit,  $\chi^2(116) = 270.01$ , RMSEA = 0.07, CFI = 0.90, SRMR = 0.07 (Tabachnick and Fidell 2007). The AIC of this model was 12,878.97, the BIC was

13,117.89 (sample size adjusted BIC = 12,914.91). The model explained 46% of the variance in autonomy at Time 2. Figure 1 shows the results for this model. Standardized path coefficients show that receiving instrumental support at Time 1 was negatively associated with perceived autonomy at Time 1 ( $\beta = -0.28, p < .001$ ). Longitudinally, received instrumental support (Time 1) showed no significant association with perceived autonomy at Time 2 ( $\beta = 0.05, n.s.$ ). This longitudinal path was further examined by specifying a second model that included a latent interaction term for self-efficacy beliefs and received instrumental support.

The results for the interaction model are shown in Figure 2. The unstandardized coefficient for the interaction term was significant ( $B = -0.30, p < .05$ ), indicating that the impact of received instrumental support on perceived autonomy depends on the level of self-efficacy beliefs. The model with interaction term had lower AIC = 8,827.60 and BIC = 9,033.93 values (sample size adjusted BIC = 8,846.91), indicating a better fit compared to the model without interaction. .

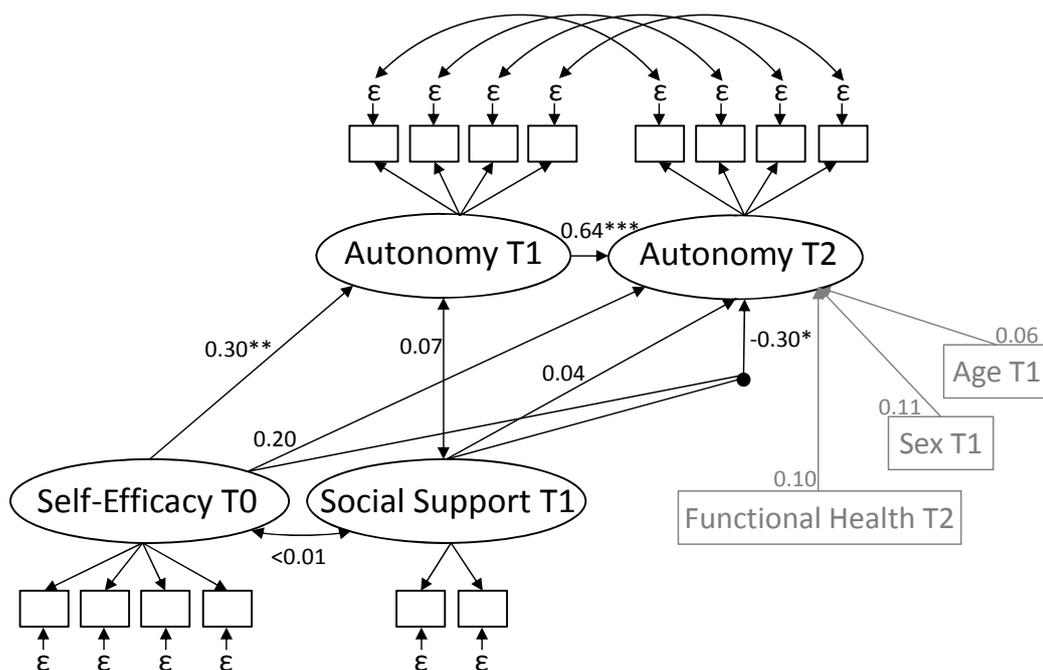
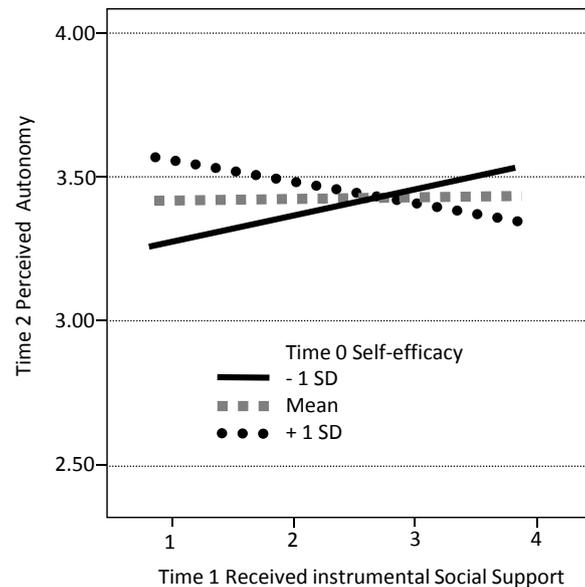


Figure 2. Structural Equation Model with Interaction Term

Note.  $*p < .05$ ;  $**p < .01$ ;  $***p < .001$ . Reported are unstandardized coefficients. Covariates were Age, sex and functional health. T0=baseline, T1=Time 1, T2=Time 2.

We used simple slopes analysis (Aiken and West 1991) to determine whether the association of received support with autonomy at Time 2 was compensatory for individuals with lower self-efficacy and interfering for those with higher self-efficacy. Figure 3 depicts the association of the

manifest measures of received instrumental support with perceived autonomy at Time 2 at three theoretical levels of self-efficacy (-1 SD, Mean, +1 SD).



*Figure 3.* Simple Slopes Analysis Depicting the Interaction between Instrumental Support and Self-efficacy.

In accordance with the compensation hypothesis, individuals lower in self-efficacy (-1 SD) – depicted in the solid line in Figure 3 – reported higher levels of autonomy, when they received more instrumental support, whereas individuals higher in self-efficacy (+ 1 SD) – depicted in the dotted line in Figure 3 – reported to perceive more autonomy when their levels of instrumental social support were lower, which is in line with the interference hypothesis.

## Discussion

In this longitudinal study, we aimed at identifying the relation of received instrumental support to perceived autonomy in a sample of older persons with multiple illnesses. We showed that different levels of self-efficacy beliefs make a difference on whether received instrumental support is detrimental or beneficial for perceived autonomy. Three hypotheses were tested: a) The mobilization hypothesis, assuming that cross-sectionally received social support is negatively related to autonomy, as persons with less perceived autonomy mobilize more support, b) the compensation hypothesis, postulating that longitudinally persons lower in self-efficacy can maintain autonomy by being instrumentally supported, and b) the interference hypothesis, suggesting that persons higher in self-efficacy experience declines in autonomy when they receive instrumental support.

In our study, women and older participants reported higher levels of received instrumental support, which is in line with previous studies (Edelbrock et al. 2001; Longino and Lipman 1981). Despite the high number of chronic conditions in the sample, and considering the sample's age, participants still experienced high levels of autonomy, which were quite stable over the period of investigation (three months). This may be explained by Ryan and Deci's (2006) conception of autonomy: Autonomy can not only be restored by performing a chosen action on one's own, but also by delegating actions to others, if they are considered to be no more within reach of one's own means (Ryan and Deci 2006). Thus, perceived self-efficacy and received instrumental social support were hypothesized to be focal resources for the maintenance of autonomy in old age. In accordance with this assumption, persons higher in self-efficacy beliefs perceived greater autonomy in this study. The role of received instrumental support, however, can only be understood by taking additional approaches into consideration: The mobilization, compensation and interference hypotheses.

Our study corroborates previous cross-sectional studies that often found negative relations between received instrumental support and well-being (Barrera 1986; Ringdal et al. 2007; Schwarzer and Leppin 1991; Silverstein et al. 1996). This effect can be explained using the mobilization hypothesis, which states that receiving instrumental support is not the cause of adverse outcomes for an individual, but rather an indicator of ill health and low well-being: Being worse off in the first place evokes higher levels of support from the social network (Väänänen et al. 2005). Besides the fact that causality cannot be tested with the design of our study, the disappearance of the negative relation of receiving instrumental support with perceived autonomy in the longitudinal analysis further corroborates the cross-sectional mobilization hypothesis. In our data, the negative association between received instrumental support and autonomy vanished when tested longitudinally; however, it did not turn into a positive effect. To fully understand the time-lagged effect of received instrumental support, one has to consider two further hypotheses – the compensation and interference hypotheses, which posit that it is necessary to additionally take levels of self-efficacy into consideration.

We specified a latent interaction model with an interaction term of self-efficacy and received instrumental support. The significance of the interaction term and better fit indices of the interaction model as compared to the model without interaction indicated that the longitudinal relation of received instrumental support is moderated by self-efficacy: If individuals have lower self-efficacy, their reports of social support are positively related to their perceptions of autonomy.

Hence, they seem to compensate their low levels of self-efficacy with social support. This replicates findings on the compensation hypothesis in patients with cancer (Aymanns 1992), rheumatoid arthritis (Reich and Zautra 1995) as well as on patients recovering from heart surgery (Schröder 1997).

In contrast, in individuals with higher levels of self-efficacy who additionally received higher levels of social support, personal and social resources interfered. For those individuals perceptions of autonomy were negatively related to social support. This corroborates the interference hypothesis and is in line with previous research showing that receiving support might enhance increases in feelings of dependence, anxiety, guilt and depression and reduced self-esteem (Bolger et al. 2000; Lu and Argyle 1992; Newsom and Schulz 1998; Warner et al. 2010). Our results suggest that potential negative or non-existent time-lagged effects of receiving instrumental support depend on whether support recipients still feel able to perform and choose actions on their own. Hence, higher self-efficacy – an important resource on its own – might make it more likely that chronically ill older persons perceive social support as something that is imposed on them, as something creating dependence or threatening their autonomy.

#### *Limitations*

The results of our study are limited to older adults with multimorbidity, a group at high risk for further health deteriorations and premature mortality. However, this means that the results cannot necessarily be generalized to other groups with threatened autonomy such as individuals with special needs. This study investigated received instrumental support only, as we considered this kind of help to be the most important to restore autonomy in an older functionally limited sample. However, other studies also found negative effects of received emotional support (e.g., Warner et al. 2010) and informational support from family and friends (e.g., Helgeson and Cohen 1996), which might be explained by an interaction with personal resources as well, and should, therefore, be investigated in future research. Future research might also profit from the increased reliability of a measure of received instrumental support, which contains more than two items.

Furthermore, future longitudinal studies on older adults with multiple chronic conditions should encompass a longer time interval, as the assumed rapid changes in autonomy did not occur during the three months period of the present study. Due to the study's design, the causality assumptions of the hypothesis could not be examined sufficiently and should, therefore, be tested in more adequately designed studies (e.g., randomized controlled trials).

*Implications for Research*

Our study suggests taking into consideration personal resources when examining the impact of social resources, as the resources interact in producing individual outcomes. Personal resources can moderate the associations between received social support and perceptions of autonomy in older and chronically ill adults. Therefore, future studies on the effects of receiving help should also take initial levels of self-efficacy into account.

The newly developed Perceived Autonomy in Old Age scale measures autonomy in terms of independence as well as freedom of choice, which covers a wider range of perceptions of autonomy than Ryan and Deci's definition of autonomy that primarily focuses on freedom of choice (2006). Thus, the Perceived Autonomy in Old Age reflects a broader construct of living autonomously which is in line with the common sense of autonomy among older adults (Schwarzer 2008). The scale showed good internal consistency and discriminant validity in a pilot study as well as in the present study.

*Implications for Practice*

Even well intended help may undermine perceptions of autonomy of older chronically ill persons, if they still feel capable to cope with emerging problems on their own. As an exaggerated consequence, this would mean that individuals with higher self-efficacy beliefs should not be helped at all. However, this will probably not be the best option, as higher levels of self-efficacy and unrealistic optimism might co-occur in some individuals (Schwarzer 1994). As social partners often reward dependent behavior not only in institutionalized but also in community-living older and chronically ill persons (so called dependency-supportive scripts; Baltes and Wahl 1992; Baltes et al. 1987), we would suggest two approaches: On the one hand, providers of help should take recipients' perceptions of self-efficacy into account and ask whether they would like to be helped before deciding on whether to provide help at all and which kind of help might be appropriate. On the other hand, family members and professional services who provide help to older chronically ill persons – no matter whether they are higher or lower in self-efficacy – should be trained to support recipients' autonomy and self-responsibility throughout the helping process. This way, caregivers are encouraged to emphasize that the recipients will be supported in whatever action they choose, however, that the choice of action remains within the recipient of help (Baltes et al. 1994; Ryan and Solky 1996; Von Bergen et al. 1999). Over and above an encouragement to maintain autonomy, such an autonomy-supportive approach is more likely to lead to greater program involvement, higher adherence to health behaviors, more independent self-care behavior, and might therefore be

the preferred approach for individuals with multimorbidity (Ryan and Solky 1996; Williams 2002; Baltes et al. 1994).

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### **References**

- Aiken LS, West SG (1991) Multiple regression: Testing and interpreting interactions. Sage, Newbury Park, CA
- Aymanns P (1992) *Krebserkrankung und familie* [cancer and family]. Hans Huber, Bern
- Baltes MM (1995) Dependency in old age: Gains and losses. *Curr Dir Psychol Sci* 4:14-19
- Baltes MM, Kindermann T, Reizenzein R, Schmid U (1987) Further observational data on the behavioral and social world of institutions for the aged. *Psychol Aging* 2:390-403
- Baltes MM, Neumann E-M, Zank S (1994) Maintenance and rehabilitation of independence in old age: An intervention program for staff. *Psychol Aging* 9:179-188
- Baltes MM, Silverberg S (1994) The dynamics between dependency and autonomy: Illustrations across the life span. In: Featherman DL, Lerner RM, Perlmutter M (eds) *Life-span development and behavior*. NJ: Erlbaum., Hillsdale, pp 41-90
- Baltes MM, Wahl H-W (1992) The dependency-support script in institutions: Generalization to community settings. *Psychol Aging* 7:409-418
- Bandura A (1997) *Self-efficacy: The exercise of control*. Freeman, New York
- Barrera M (1986) Distinctions between social support concepts, measures, and models. *Am J Community Psychol* 14:413-445
- Bengtson VL, Kuypers JA (1985) The family support cycle: Psycho-social issues in the aging family. In: J. M. A. Munnichs PM, & E. Olbrich (ed) *Life span and change in a gerontological perspective*. Academic Press, New York, pp 61-77
- Bolger N, Zuckerman A, Kessler RC (2000) Invisible support and adjustment to stress. *J Pers Soc Psychol* 79:953-961
- Bonetti D, Johnston M, Rodriguez-Marin J, Pastor M, Martin-Aragon M, Doherty E, Sheehan K (2001) Dimensions of perceived control: A factor analysis of three measures and an examination of their relation to activity level and mood in a student and cross-cultural patient sample. *Psychol Health* 16:655-674
- Brehm JW, Cole AH (1966) Effect of a favor which reduces freedom. *J Pers Soc Psychol* 3:420-426

- Brown SL, Vinokur AD (2003) The interplay among risk factors for suicidal ideation and suicide: The role of depression, poor health, and loved ones' messages of support and criticism. *Am J Community Psychol* 32:131-141
- Charlson ME, Szatrowski TP, Peterson J, Gold J (1994) Validation of a combined comorbidity index. *J Clin Epidemiol* 47:1245-1251
- Chen G, Gully SM, Whiteman JA, Kilcullen RN (2000) Examination of relationships among trait-like individual differences, state-like individual differences, and learning performance. *J Appl Psychol* 85:835-847
- Cohen JL, Lakey B, Tiell K, Neeley LC (2005) Recipient-provider agreement on enacted support, perceived support, and provider personality. *Psychol Assess* 17:375-378
- Curran PJ, West SG, Finch JF (1996) The robustness of test statistics to nonnormality and specification error in confirmatory factor analysis. *Psychol Meth* 1:16-29
- Edelbrock D, Buys L, R., Waite L, M., Grayson D, A., Broe GA, Creasey H (2001) Characteristics of social support in a community-living sample of older people: The sydney older persons study. *Australas J Ageing* 20:173-178
- Endler NS, Kocovski NL, Macrodimitris SD (2001) Coping, efficacy, and perceived control in acute versus chronic illnesses. *Pers Individ Differ* 30:617-625
- Fauth EB, Zarit SH, Malmberg B, Johansson B (2007) Physical, cognitive, and psychosocial variables from the disablement process model predict patterns of independence and the transition into disability for the oldest-old. *Gerontologist* 47:613-624
- Fortin M, Lapointe L, Hudon C, Vanasse A, Ntetu AL, Maltais D (2004) Multimorbidity and quality of life in primary care: A systematic review. *Health Qual Life Outcome* 2:doi:10.1186/1477-7525-1182-1151
- Gijzen R, Hoeymans N, Schellevis FG, Ruwaard D, Satariano WA, van den Bos GA (2001) Causes and consequences of comorbidity: A review. *J Clin Epidemiol* 54:661-674
- Greiner W, Weijnen T, Nieuwenhuizen M, Oppe S, Badia X, Busschbach J, et al. (2003) A single European currency for EQ-5D health states. *Eur J Health Econ* 4:222-231
- Groll DL, To T, Bombardier C, Wright JG (2005) The development of a comorbidity index with physical function as the outcome. *J Clin Epidemiol* 58:595-602
- Haber MG, Cohen JL, Lucas T, Baltes BB (2007) The relationship between self-reported received and perceived social support: A meta-analytic review. *Am J Community Psychol* 39:133-144
- Hays J, Saunders W, Flint E, Kaplan B, Blazer D (1997) Social support and depression as risk factors for loss of physical function in late life. *Aging Ment Health* 1:209-220
- Helgeson VS, Cohen S (1996) Social support and adjustment to cancer: Reconciling descriptive, correlational, and intervention research. *Health Psychol* 15:135-148
- Hertz JE, Anschutz CA (2002) Relationships among perceived enactment of autonomy, self-care, and holistic health in community-dwelling older adults. *J Holist Nurs* 20:166-186. doi:10.1177/08910102020002006
- Klein A, Moosbrugger H (2000) Maximum likelihood estimation of latent interaction effects with the lms method. *Psychometrika* 65:457-474

- Lawton MP, Brody EM (1969) Assessment of older people: Self-maintaining and instrumental activities of daily living. *Gerontologist* 9:179-186
- Librero J, Peiró S, Ordiñana R (1999) Chronic comorbidity and outcomes of hospital care: Length of stay, mortality, and readmission at 30 and 365 days. *J Clin Epidemiol* 52:171-179
- Longino CF, Lipman A (1981) Married and spouseless men and women in planned retirement communities: Support network differentials. *J Marriage Fam* 43:169-177
- Lu L, Argyle M (1992) Receiving and giving support: Effects on relationships and well-being. *Counsell Psychol Q* 5:123
- Luszczynska A, Boehmer S, Knoll N, Schulz U, Schwarzer R (2007). Emotional support for men and women with cancer: Do patients receive what their partners provide? *Int J Behav Med* 14:156-163
- Luszczynska A, Gibbons FX, Piko B, Teközel M (2004) Self-regulatory cognitions, social comparison, perceived peers' behaviors as predictors of nutrition and physical activity: A comparison among adolescents in hungary, poland, turkey, and USA. *Psychol Health* 19:577-593
- Luszczynska A, Gutiérrez-Doña B, Schwarzer R (2005a) General self-efficacy in various domains of human functioning: Evidence from five countries. *Int J Psychol* 40:80-89
- Luszczynska A, Scholz U, Schwarzer R (2005b) The general self-efficacy scale: Multicultural validation studies. *J Psychol* 139:439-457
- Matsui M, Capezuti E (2008) Perceived autonomy and self-care resources among senior center users. *Geriatr Nurs* 29:141-147
- Newsom JT, Schulz R (1998) Caregiving from the recipient's perspective: Negative reactions to being helped. *Health Psychol* 17:172-181
- Pavot WG, Diener E, Colvin CR, Sandvik E (1991) Further validation of the satisfaction with life scale: Evidence for the cross-method convergence of well-being measures. *J Pers Assess* 57:149-161
- Proot IM, Crebolder HFJM, Abu-Saad HH, Macor THGM, Meulen RHJT (2000) Facilitating and constraining factors on autonomy: The views of stroke patients on admission into nursing homes. *Clin Nurs Res* 9:460-478. doi:10.1177/10547730022158690
- Proot IM, ter Meulen RHJ, Abu-Saad HH, Crebolder HFJM (2007) Supporting stroke patients' autonomy during rehabilitation. *Nurs Ethics* 14:229-241. doi:10.1177/0969733007073705
- Reich JW, Zautra AJ (1995) Spouse encouragement of self-reliance and other-reliance in rheumatoid arthritis couples. *J Behav Med* 18:249
- Reis HT, Sheldon KM, Gable SL, Roscoe J, Ryan RM (2000) Daily well-being: The role of autonomy, competence, and relatedness. *Pers Soc Psychol Bull* 26:419-435
- Revenson TA, Wollman CA, Felton BJ (1983) Social supports as stress buffers for adult cancer patients. *Psychosom Med* 45:321-331
- Ringdal GI, Ringdal K, Jordhøy MS, Kaasa S (2007) Does social support from family and friends work as a buffer against reactions to stressful life events such as terminal cancer? *Palliative & Supportive Care* 5:61-69

- Ryan RM, Deci EL (2000) Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am Psychol* 55:68-78
- Ryan RM, Deci EL (2006) Self-regulation and the problem of human autonomy: Does psychology need choice, self-determination, and will? *J Pers* 74:1557-1585
- Ryan RM, Solky JA (1996) What is supportive about social support? In: Pierce GR, Sarason BR, Sarason IG (eds) *Handbook of social support and the family*. Plenum Press, New York, US, pp 249-267
- Ryff C D (1995) Psychological well-being in adult life. *Curr Dir Psychol Sci* 4:99-104
- Sarason IG, Levine HM, Basham RB, Sarason BR (1983) Assessing social support: The social support questionnaire. *J Pers Soc Psychol* 44:127-139
- Schröder K (1997) Self-regulation competence in coping with chronic disease. *Internationale Hochschulschriften*. Waxmann, Münster
- Schröder K, Schwarzer R, Konertz W (1998) Coping as a mediator in recovery from cardiac surgery. *Psychol Health* 13:83-97
- Schüz B, Wurm S, Warner LM, Ziegelmann JP (in press) Self-efficacy and illness representations in individuals with multimorbidity: A multilevel approach. *Psychol Health*
- Schulenburg JM., Claes C, Greiner W, Uber A (1998) Die deutsche Version des EuroQol-Fragebogens [The German version of the EQ5D]. *Z Gesundh Wiss* 6:3-20
- Schulz U, Schwarzer R (2003) Soziale Unterstützung bei der Krankheitsbewältigung: Die Berliner Social Support Skalen (BSSS). *Diagnostica* 49:73-82
- Schwarzer R (1994) Optimism, vulnerability, and self-beliefs as health-related cognitions: A systematic overview. *Psychol Health* 9:161-180
- Schwarzer R (2008) Perceived autonomy in old age. <http://userpage.fu-berlin.de/~health/autonomy.htm>. Accessed June 19, 2010
- Schwarzer R, Boehmer S, Luszczynska A, Mohamed NE, Knoll N (2005) Dispositional self-efficacy as a personal resource factor in coping after surgery. *Pers Individ Differ* 39:807-818
- Schwarzer R, Jerusalem M (1995) Generalized self-efficacy scale. In: Weinman J, Wright S, Johnston M (eds) *Measures in health psychology: A user's portfolio*. Causal and control beliefs. NFER-Nelson, Windsor, England, pp 35-37
- Schwarzer R, Knoll N (2007) Functional roles of social support within the stress and coping process: A theoretical and empirical overview. *Int J Psychol* 42:243-252
- Schwarzer R, Leppin A (1991a) Social support and health: A theoretical and empirical overview. *J Soc Pers Relat* 8:99-127
- Schwarzer R, Schulz U (2000) Berlin Social Support Scales (BSSS). [www.coping.de](http://www.coping.de). Accessed June 19, 2010
- Seeman TE, Bruce ML, McAvay GJ (1996) Social network characteristics and onset of ADL disability: Macarthur studies of successful aging. *J Gerontol B Psychol Sci Soc Sci* 51:191-200

- Seeman TE, Unger JB, McAvay G, Mendes de Leon CF (1999) Self-efficacy beliefs and perceived declines in functional ability: Macarthur studies of successful aging. *J Gerontol B Psychol Sci Soc Sci* 54B:214-222
- Sibley A, Kersten P, Ward CD, White B, Mehta R, George S (2006) Measuring autonomy in disabled people: Validation of a new scale in a UK population. *Clin Rehabil* 20:793-803
- Silverstein M, Xuan C, Heller K (1996) Too much of a good thing? Intergenerational social support and the psychological well-being of older parents. *J Marriage Fam* 58:970-982
- Smith J, Goodnow JJ (1999) Unasked-for support and unsolicited advice: Age and the quality of social experience. *Psychol Aging* 14:108-121
- Steverink N, Lindenberg S, Slaets JPJ (2005) How to understand and improve older people's self-management of wellbeing. *Eur J Ageing* 2:235-244
- Tabachnick BG, Fidell LS (2007) Using multivariate statistics. 5 edn. Allyn & Bacon/Pearson Education, Boston, MA
- Thompson SC, Sobolew-Shubin A (1993) Perceptions of overprotection in ill adults. *J Appl Soc Psychol* 23:85-97
- Väänänen A, Vahtera J, Pentti J, Kivimäki M (2005) Sources of social support as determinants of psychiatric morbidity after severe life events: Prospective cohort study of female employees. *J Psychosom Res* 58:459-467
- van den Akker M, Buntinx F, Metsemakers JF, Roos S, Knottnerus JA (1998) Multimorbidity in general practice: Prevalence, incidence, and determinants of co-occurring chronic and recurrent diseases. *J Clin Epidemiol* 51:367-375
- Von Bergen CW, Soper B, Rosenthal GT, Cox SJ, Fullerton R (1999) When helping hurts: Negative effects of benevolent care. *J Am Psychiatr Nurses Assoc* 5:134-136
- Wahl H-W (1991) Dependence in the elderly from an interactional point of view: Verbal and observational data. *Psychol Aging* 6:238-246
- Warner LM, Schüz B, Wurm S, Ziegelmann JP, Tesch-Römer C (2010) Giving and taking – differential effects of providing, receiving and anticipating emotional support on quality of life in adults with multiple illnesses. *J Health Psychol* 15:660-670
- Wethington E, Kessler RC (1986) Perceived support, received support, and adjustment to stressful life events. *J Health Soc Behav* 27:78-89
- Williams GC (2002) Improving patient's health through supporting the autonomy of patients and providers. In: Deci EL, Ryan RM (eds) *Handbook of self-determination research*. University of Rochester Press, Rochester, NY, pp 233-254
- Williams GC, Freedman ZR, Deci EL (1998) Supporting autonomy to motivate patients with diabetes for glucose control. *Diabetes Care* 21:1644-1651.
- Wurm S, Tomasik MJ, Tesch-Römer C (2010) On the importance of a positive view on ageing for physical exercise among middle-aged and older adults: Cross-sectional and longitudinal findings. *Psychol Health* 25:25 - 42

- Zautra AJ, Reich JW, Newsom JT (1995) Autonomy and sense of control among older adults: An examination of their effects on mental health. In: Bond L, Cutler S, Grams A (eds) Promoting successful and productive aging. Sage, Newbury Park, CA, pp 153–170
- Zissi A, Barry MM, Cochrane R (1998) A mediational model of quality of life for individuals with severe mental health problems. *Psychol Med* 28:1221-1230

# 4

## Synergistic Effect of Social Support and Self-Efficacy on Physical Exercise in Older Adults

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Warner, L.M., Ziegelmann, J. P., Schüz, B., Wurm, S., & Schwarzer, R. (in press).

Synergistic effect of social support and self-efficacy on physical exercise in older adults. *Journal of Aging and Physical Activity*.

The original article will be available online at: <http://journals.humankinetics.com/japa>

Please contact the corresponding author (Lisa Marie Warner) for pdf request.

### **Abstract**

The purpose of the present study is to examine whether the effects of social support on physical exercise in older adults depend on individual perceptions of self-efficacy. Three hundred and nine older German adults (age 65-85) were assessed at 3 points in time (each 3 months apart). In hierarchical regression analyses, support received from friends and exercise self-efficacy were specified as predictors of exercise frequency while controlling for baseline exercise, sex, age, and physical functioning. Besides main effects of self-efficacy and social support, an interaction between social support and self-efficacy emerged. Persons with low self-efficacy were less likely to be active in spite of having social support. Persons with low support were less likely to be active even if they were high in self-efficacy. This points to the importance of both social support and self-efficacy and implies that these resources could be targets of interventions to increase older adults' exercise.

*Keywords:*

self-efficacy, social support, older adults, physical exercise, multimorbidity

# 5

## Sources of Self-Efficacy for Physical Activity in Older Adults with Multiple Illnesses

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Warner, L.M., Schüz, B., Knittle, K., Ziegelmann, J. P., Wurm, S. (in press). Sources of perceived self-efficacy as predictors of physical activity in older adults. *Applied Psychology: Health and Well-Being*.

The original article will be available online at:

<http://onlinelibrary.wiley.com/journal/10.1111/%28ISSN%291758-0854>

Please contact the corresponding author (Lisa Marie Warner) for pdf request.

### **Abstract**

According to Bandura's self-efficacy theory, there are four sources of self-efficacy: past experience, vicarious experience, verbal persuasion, and perception of physical states. The aims of the study were twofold: To review previous research on the sources of self-efficacy and to examine the sources in predicting self-efficacy for exercise in older adults with multimorbidity. A sample of 309 older adults with multimorbidity was assessed at 2 time points for exercise, exercise specific self-efficacy, and four sources of self-efficacy. Past experiences, vicarious experiences, and subjective health had significant direct effects on self-efficacy and indirect effects on exercise via self-efficacy. Persuasive arguments did not predict self-efficacy. This suggests that future research should target past experiences and vicarious experiences as sources of self-efficacy.

*Keywords:*

Sources of self-efficacy, exercise, multimorbidity, subjective health, objective health

# 6

## Interactive Effects of Social Support and Social Conflict in the Prediction of Medication Adherence in Multimorbid Older Adults

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Warner, L.M., Schüz, B., Aiken, L., Ziegelmann, J. P., Wurm, S., Tesch-Römer, C., & Schwarzer, R. (in preparation). Interactive Effects of Social Support and Social Conflict in the Prediction of Medication Adherence in Multimorbid Older Adults.

### **Abstract**

When people become older and suffer from multiple health conditions, their medication regimens become more complex and demanding, which may result in suboptimal adherence. Social support has been found to improve adherence, but findings differ when social conflict is also taken into account. We examined general support along with medication-specific support and social conflict to identify possible mechanisms that operate in the prediction of adherence. In a longitudinal observational study with two time points six months apart (Time 1, Time 2), 309 multimorbid adults (65+ years of age) reported medication adherence and both social support and social conflict. With baseline adherence and covariates (i.e., sex, age, education, number of medicines, attitudes towards medicines, and health status) controlled, Time 2 adherence was regressed on Time 1 general support, medication-specific support and social conflict. Medication-specific support was the only significant predictor and negatively predicted adherence, that is, high specific support was associated with lower adherence. Social conflict moderated this relationship – only among participants with high social conflict was medication-specific support negatively related to adherence. This finding illustrates the need for a more refined analysis of various social factors that might enhance or compromise medication adherence when operating in concert.

*Key words:*

medication adherence, medication-specific social support, received social support, multimorbidity, social conflict

## Introduction

An estimated 61 per cent of men and 65 per cent of women over the age of 60 suffer from two or more co-occurring diseases (van den Akker, Buntinx, Metsemakers, Roos, & Knottnerus, 1998). Having two or more chronic conditions at a time is known as *multimorbidity* and entails some complication for those affected: more frequent health care utilization, longer hospital stays, greater likelihood of developing disabilities and declines in quality of life (Fortin, Dubois, Hudon, Soubhi, & Almirall, 2007; Gijzen, et al., 2001; Kadam & Croft, 2007). Moreover, persons with multiple chronic conditions often face the problem of complicated treatment regimes, as the number of medications increases with the number of diseases (Tinetti, Bogardus, & Agostini, 2004). Whereas adherence rates are relatively high among patients with acute conditions, those with chronic conditions often fail to follow their prescribed treatment reasonably closely during the long-term course of their illness (Doggrell, 2010; Osterberg & Blaschke, 2005). Poor medication adherence, however, adds to the complaints that multimorbidity already implicates, as it can worsen the overall health status, often leads to medication-related hospital admissions, and enhances the likelihood of mortality (Simpson, et al., 2006). The present study aimed to characterize the interplay of social influences on medication adherence among community residing multimorbid older adults.

A substantial body of research on the putative determinants of adherence has addressed the challenges that patients encounter in taking medication as prescribed. Demographic and socio-economic factors (e.g., age, gender, education, etc.), characteristics of the disease and treatment (e.g., chronic versus acute diseases, number of medicines, etc.), and individual resources (e.g., health status, medication beliefs, etc.) have been considered. Beyond this, social resources (e.g., social network characteristics, lack of support perception and receipt, etc.) have received special focus as they relate to adherence (DiMatteo, 2004a, 2004b; Doggrell, 2010; Zivin, Ratliff, Heisler, Langa, & Piette, 2010). The multidimensional nature of social resources requires a more nuanced consideration of types and levels of specificity of social influences.

### *Social Resources and Risk Factors for Health and Well-Being in Older Adults*

Social resources can be classified into the distinct constructs of social integration, social support and social conflict (Lakey, 2010). Social integration such as having a spouse or frequent contact with a social network is a structural measure of social influence and is predominantly positively related to health and health behaviours in older adults (Uchino, 2009). However, there are social resources and risk factors at work within these networks that are more proximal to health

and health behaviour and may potentially support or undermine health (Everson-Rose & Lewis, 2005; Newsom, 1999). Among these functional social resources are positive interactions that include both received social support and anticipated social support. Yet other unsupportive interactions, such as social conflict (Everson-Rose & Lewis, 2005; Newsom, 1999).

Each of these functional aspects of the social network requires distinct consideration. Social conflict is not just the absence of being or feeling supported, but is rather distinct social construct that is consistently associated with adverse effects for health and well-being in older and chronically ill adults (Abbey, Abramis, & Caplan, 1985; Everson-Rose & Lewis, 2005). Likewise, the receipt of support in times of stress and the anticipation that support would be available if needed in the future need not necessarily have much in common (Haber, Cohen, Lucas, & Baltes, 2007; Lakey & Cohen, 2007). Anticipated (perceived) appears to be grounded in an early acquired personality trait that is closely linked to relationship satisfaction, extraversion, agreeableness and self-worth and is consistently positively associated with health and health behaviour. In contrast received (enacted) support is grounded in the experience of having received help, whether or not this help was solicited (Lakey, 2010; Lakey & Scoboria, 2005; Uchino, 2009). Some studies report positive effects of received social support (e.g., Penninx, Van Tilburg, Deeg, & Kriegsman, 1997; Schwarzer & Knoll, 2007). Yet received support may be unrelated (e.g., Brown, Nesse, Vinokur, & Smith, 2003) or even harmful to health and health behaviours especially in older and chronically ill adults (Hays, Saunders, Flint, Kaplan, & Blazer, 1997; Lakey, 2010; Newsom, 1999; Seeman, Bruce, & McAvay, 1996; Uchino, 2009).

The disparate effects of received support underline the importance of further research to uncover the conditions under which such support is associated with positive versus negative health outcomes. One simple explanation for negative relationships between received support and health is that those who are in greatest need, (i.e., who are experiencing significant adverse events that threaten health), – receive more support in response to their need. This explanation, known as the mobilization hypothesis, has a temporal aspect: Whereas cross-sectionally received support coincides with adverse events, the longitudinal outcomes of received support should be positive (Schwarzer & Leppin, 1991; Väänänen, Vahtera, Pentti, & Kivimäki, 2005). In fact, harmful effects of received support have been observed in both cross-sectional and longitudinal studies, and alternative explanations of the adverse effects of receiving social support have been considered. The aged and the chronically ill are often met with support, even if they have not directly sought assistance (Reich & Zautra, 1995; Smith & Goodnow, 1999; Zautra, Reich, & Newsom, 1995).

Such received support can be interpreted as an affirmation of not being able to cope with stressors on one's own and thus threatens older recipients' self-esteem, control beliefs and need for autonomy (Bolger & Amarel, 2007; Warner, Schüz, Wurm, Ziegelmann, & Tesch-Römer, 2010; Warner, et al., 2011). Beyond this received support that threatens competence, older adults experience considerable social conflict (Krause & Rook, 2003), which must be taken into account in the analysis of received support (Liang, Krause, & Bennett, 2001), as the presence of conflict in relationships may undermine the positive effects of received support even further (Holt-Lunstad, Uchino, Smith, & Hicks, 2007).

#### *Social Support and Medication Adherence*

In contrast with the ample evidence of negative effects of receiving overall life support to cope with stressors, social support that is received for a particular health behaviour is usually thought to be more predictive and positively related to the performance of that behaviour (Uchino, 2009). Older and chronically ill persons, benefit from specific social support for exercise and physical activity (e.g., Stevens, Lemmink, van Heuvelen, de Jong, & Rispens, 2003; Warner, Ziegelmann, Schüz, Wurm, & Schwarzer, in press), from dietary support (e.g., Salehi, et al., 2010; Sallis, Grossman, Pinski, Patterson, & Nader, 1987) and from support for their medication regimes (Sayers, White, Zubritsky, & Oslin, 2006; Stirratt, et al., 2006).

An understanding of the impact of received social support requires specificity of measurement of support behaviours. A meta-analysis revealed that most studies of the relationship of social influences to medication adherence have employed general non-behaviour-specific social support measures (DiMatteo, 2004a). DiMatteo found that unidimensional measures of social resources such as structural network characteristics or general received or anticipated social support relate positively to medication adherence in the aged and chronically ill (DiMatteo, 2004a). However, general social support has exhibited negative effects on adherence under certain circumstances as well (Hamilton, Razzano, & Martin, 2007). It has been suggested that characterizing social support in a behaviour-specific manner, such as asking recipients whether interaction partners reminded them to take, bought or organized their medication, should provide better prediction of medication adherence (Uchino, Cacioppo, & Kiecolt-Glaser, 1996). Few studies have measured the receipt of medication-specific social support; results of these studies are inconsistent. Only one study that measured received medication-specific support reported a positive relation to adherence in HIV-seropositive patients (Stirratt, et al., 2006). However, in a study on hypertensive older adults with a comorbid cardiovascular disease a negative effect of medication support on medication adherence

was found (Friedberg, et al., 2009). Studies of patients with diabetes further report practical assistance with metabolic control to be *unrelated* to adherence (Burroughs, Pontious, & Santiago, 1993; Schafer, Glasgow, McCaul, & Dreher, 1983).

### *Aims of the Study*

The study aimed to clarify the importance of social resources *and* risk factors on medication adherence over time, among multimorbid older adults – a population with both a heavy burden of medication regimen and particular need for improvement in medication adherence. We examined associations of general and medication specific support and conflict with medication adherence. We also explored whether social conflict moderated the association of social support with adherence. Finally we explored bidirectional relationships between medication support and adherence over a six-month period. The existing literature on support and adherence has considered support as a force on adherence, and has not considered the role that non-adherence might play in generating support. In a cross-lagged panel analysis we considered the bidirectional relationship between support and adherence over time, moving from a unidirectional to a bi-directional over-time perspective on the interplay between support and adherence.

## **Method**

### *Participants and Procedure*

Participants for the PREFER (Personal Resources of Elderly People with Multimorbidity: Fortification of Effective Health Behaviour) study were recruited from the third assessment wave of the German Ageing Survey (DEAS, Wurm, Tomasik, & Tesch-Römer, 2010), a population-representative survey of adults aged 40 and over, with a total *N* of 8,200. The third wave of the DEAS took part from July to September 2008 and served as recruitment pool and baseline assessment (Time 0) for the PREFER study. DEAS participants were considered eligible to be contacted for the PREFER study if they were a) 65 years or older, b) suffered from at least two chronic physical conditions mentioned either in the Charlson Comorbidity Index (Charlson, Szatrowski, Peterson, & Gold, 1994) or the Functional Comorbidity Index (Groll, To, Bombardier, & Wright, 2005) and c) had given consent to be contacted for further studies.

Of a total eligible  $n=443$  participants,  $n=309$  (69.7 %) provided informed consent and made an appointment for the first point of measurement in PREFER (Time 1, March 2009). Participants were visited at their homes by trained interviewers, completed a 30-minute personal interview and additionally completed a questionnaire with a prepaid return envelope. At Time 2 (September

2009)  $n=272$  participants (88.03% of Time 1) completed both interview and questionnaire. Participants at Time 1 were on average 73.27 years of age ( $SD = 5.10$ ), and 41.7 percent were women.

### *Measures*

#### *Independent Variables*

*General received social support* and *social conflict* were assessed in the Time 1 questionnaire with 6 and 4 items respectively from the German version of the Illness-specific Social Support Scale (ISSS, Ramm & Hasenbring, 2003; Revenson, Schiaffino, Majerovitz, & Gibofsky, 1991). Examples for the six *general received support* items are: 'If you think of the previous three months, what have persons close to you (partner, children, friends, acquaintances) done for you? Persons close to me... a) took care of many things for me, b) talked to me about important decisions, c) gave me the feeling that I can rely completely on them'. Item examples for the four *social conflict* items are: 'If you think of the previous three months, what have persons close to you (partner, children, friends, acquaintances) done for you? Persons close to me... a) found it hard to understand the way I felt, b) became annoyed when I didn't accept their advice'. Participants rated the frequency with which they received support or experienced conflict on a four-point scale from (1) '(almost) never' to (4) '(almost) always'. Responses on the received support assessment were averaged, as were responses on the conflict scale, with higher scores reflecting higher general received support and conflict, respectively. Cronbach's alpha for the six general received support items was .83, and .55 for the four social conflict items.

*Medication-specific social support* was assessed with two items that were adopted from the Medical Care Questionnaire (Sayers, et al., 2006). The Medical Care Questionnaire encompasses items on families' and friends' support for patients' overall medical and self-care decisions. These items were summarized into two items that reflect instrumental received social support for medication adherence. Participants were asked: 'If you think of the previous three months, what have persons close to you (partner, children, friends, acquaintances) done for you? Persons close to me... a) have reminded me to take my medication regularly, b) have handled my medication (e.g., have fetched or organized it)'. Answers ranged from (1) '(almost) never' to (5) '(almost) always'. These two items were correlated ( $r = .58, p < .001$ ) at both points in time.

#### *Dependent Variable*

*Medication adherence* was assessed with an item from the Reported Adherence to Medication Scale (RAM, Horne, Weinman, & Hankins, 1999) that reads, 'Some people forget to take their medicines. How often does this happen to you?', with responses on a 5-point scale from

(1) ‘(almost) never’ to (5) ‘(almost) always’. As the distribution of this measure was highly skewed, with 73.1% of the participants reporting complete adherence at Time 1 and 68.0% at Time 2, this measure was dichotomized into 1 for full adherence and 0 for non-adherence (reflecting any answer from 1 to 4).

#### *Covariates*

*Covariates* were sex, age, education, number of medicines, health status and attitude towards medication, because of their well established relation to medication adherence (DiMatteo, 2004a, 2004b; Doggrell, 2010; Zivin, et al., 2010).

*Number of medication* was assessed with a computer-assisted full medication inventory in the Time 1 interview (Psaty, et al., 1992). The interviewers asked participants to bring all of the medicines they currently took, and recorded them.

*Education level* was classified according to the International Standard Classification of Education (ISCED, Unesco, 1997), with (1) indicating low education (at most 9 years school education), (2) indicating medium education (secondary school) and (3) indicating high education (qualifying for university admission).

*Health status* was measured in the Time 1 interview with a peak expiratory flow meter that assesses the maximum pulmonary expiratory flow. It has been shown that this is a reliable and sensitive indicator of fitness in older and frail adults (Cook, et al., 1995). Participants maximally exhale into the instrument twice. Scores could range from 60-800 litres per minute, and the better result of the two trials was taken as the measure of health status (Cook, et al., 1991). Higher scores indicate better health status.

*Attitudes towards medication* were assessed in the Time 1 questionnaire with an item adopted from Kikkert et al. (2006): ‘My medication or my treatment regime is effective for my disease’ (1) ‘totally disagree’ to (4) ‘totally agree’.

#### *Analytic Procedure*

Descriptive data analysis, Pearson correlations and logistic regressions were carried out with SPSS 18.0. The cross-lagged panel analysis was performed using the WLSMV estimator in Mplus 5.21. Simple slopes analyses were used to detect the direction of the interaction term (Aiken & West, 1991) and displayed using a SPSS macro (Hofmann, 2010). Missing data were treated using pairwise deletion in the cross-lagged panel and correlation analyses, and listwise deletion in the logistic regression analysis.

### *Attrition Analysis*

Those 37 participants who dropped out between Time 1 and Time 2 were examined for significant differences in the study variables at Time 1. Paired-sample t-tests and a McNemar's chi-square test for the medication adherence variable indicated that there were no differences in any of the study variables between participants, who dropped out and those who stayed in the study.

## **Results**

### *Participant Characteristics*

Characteristics of participants are reported in Table 1. Around 12.6 percent indicated low, 52.1 percent medium, and 35.3 percent high education. Participants came from all regions of Germany, with  $n = 108$  (35%) living in the eastern federal states (former German Democratic Republic). Participants had on average 5.49 chronic conditions ( $SD = 2.86$ ) at Time 1, with hypertension (67.6%), osteoarthritis (63.1%), hyperlipidaemia (49.2%), arthritis (31.1%) and peripheral vascular disease (30.7%) being the five most prominent conditions.

As shown in Table 1 health status was higher for males, for younger, and for better educated participants. Age was positively related to receipt of medication specific support, as was the number of medications. Of interest, the number of medications was positively associated with receipt of general support and also with social conflict. Only medication specific support at both time points was associated with adherence both cross-sectionally and over time; all these associations were negative.

### *Prediction of Adherence in Logistic Regression*

The logistic regression analyses of adherence are reported in Table 2. Medication adherence was regressed on baseline adherence, all covariates, general received social support and social conflict in Step 1 of the logistic regression analysis. Apart from baseline adherence at Time 1 ( $OR = 1.79$ , 95% CI 3.18 - 11.29,  $p < .001$ ) neither the covariates nor general social support or social conflict predicted medication adherence at Time 2.

Table 1. Means, Standard Deviations, Ranges, and Correlations.

	<i>M</i>	<i>SD</i>	<i>Range</i>	1	2	3	4	5	6	7	8	9	10	11
1. Sex (0=women, 1=men)	58% men	42% women												
2. Age	73.27	5.10	65-85	.09										
3. Education	2.23	0.66	1-3	.41***	-.07									
4. Number of Medicines	4.26	2.96	1-17	-.03	.10	-.09								
5. Health Status	345.51	134.48	70-780	.50***	-.24***	.36***	-.18**							
6. Attitude towards medication	3.05	1.08	1-4	-.04	.11	-.08	.22	-.18**						
7. General received Support	2.65	0.68	1-4	-.19**	.08	-.12	.19**	-.15**	.19**					
8. Social Conflict	1.42	0.42	1-3.25	.01	.03	-.09	.14*	.04	.01	.04				
9. Medication-specific social support T1	1.43	0.88	1-5	.09	.14*	-.02	.10	<.01	.07	.24***	.11			
10. Medication-specific social support T2	1.43	0.82	1-5	.11	<.01	-.04	.16*	.03	.09	.27***	.12	.54***		
11. Medication Adherence T1 (0=non-adherent, 1=adherent)	27% non-adherent	78% adherent		-.06	-.01	-.06	-.03	-.05	-.06	-.02	<-.01	-.18**	-.22***	
12. Medication Adherence T2 (0=non-adherent, 1=adherent)	32% non-adherent	68% adherent		-.03	.05	.01	-.01	-.08	.02	-.07	-.06	-.22***	-.43***	.37***

Note. \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

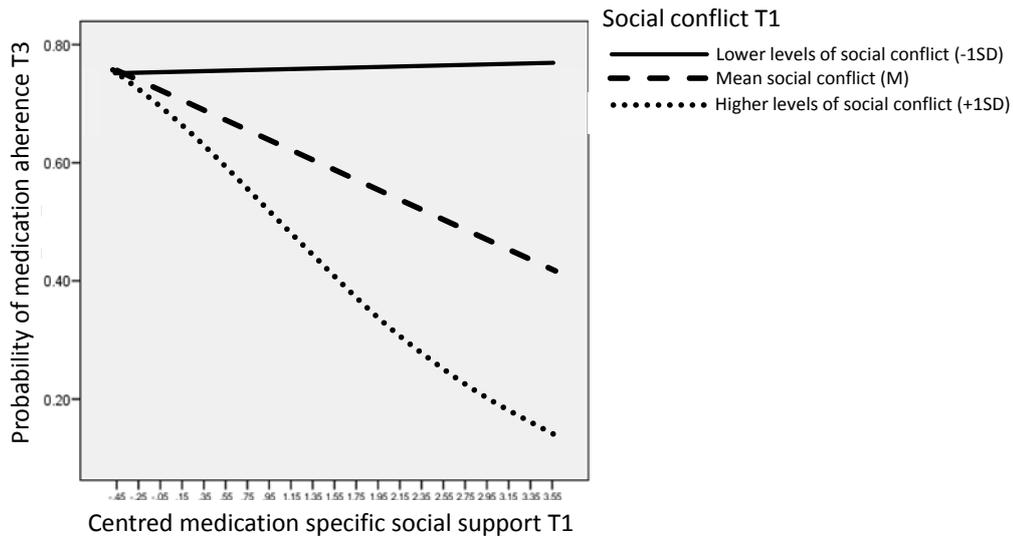
Table 2. Logistic Regression to Predict Adherence

Predictor	Step 1		Step 2		Step 3	
	B (SE)	Odds Ratio (Lower – Upper 95% CI)	B (SE)	Odds Ratio (Lower – Upper 95% CI)	B (SE)	Odds Ratio (Lower – Upper 95% CI)
Constant	-0.26 (2.66)	0.77 -	-0.79 (2.71)	.45 -	-1.15 (2.74)	0.32 -
Adherence Time 1	1.79*** (0.32)	5.99 (3.18, 11.29)	1.68*** (0.33)	5.37 (2.82, 10.24)	1.73*** (0.34)	5.62 (2.91, 10.85)
Sex	0.12 (0.42)	1.14 (0.50, 2.57)	0.25 (0.42)	1.28 (0.56, 2.94)	0.15 (0.43)	1.17 (0.50, 2.70)
Age	0.01 (0.03)	1.01 (0.95, 1.08)	0.02 (0.03)	1.02 (0.95, 1.08)	0.02 (0.03)	1.02 (0.95, 1.09)
Education	0.15 (0.26)	1.16 (0.69, 1.94)	0.11 (0.27)	1.11 (0.66, 1.89)	0.18 (0.27)	1.20 (0.70, 2.05)
Number of Medicines	0.02 (0.05)	1.02 (0.92, 1.13)	0.01 (0.05)	1.01 (0.91, 1.12)	0.01 (0.06)	1.01 (0.91, 1.12)
Health Status	<-0.01 (<0.01)	1.00 (<1.00, >1.00)	<-0.01 (<0.01)	1.00 (<1.00, >1.00)	<-0.01 (<0.01)	1.00 (<1.00, >1.00)
Attitude towards medication	0.09 (0.15)	1.09 (0.81, 1.47)	0.11 (0.15)	1.11 (0.83, 1.50)	.12 (0.16)	1.13 (0.83, 1.53)
General received Support	-0.44 (0.25)	0.64 (0.40, 1.05)	-0.31 (0.26)	0.73 (0.44, 1.21)	-0.31 (0.26)	0.73 (0.44, 1.22)
Social Conflict	-0.44 (0.35)	0.65 (0.32, 1.29)	-0.40 (0.36)	0.67 (0.33, 1.35)	-0.35 (0.38)	0.71 (0.35, 1.49)
Medication-specific social support			-0.37* (0.18)	0.69 (0.49, 0.98)	-0.35 (0.19)	0.70 (0.49, 1.02)
Interaction Specific support * conflict					-0.88* (0.45)	0.42 (0.17, <1.00)

Note. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ ,  $N=236$

Medication-specific social support was added to the prediction equation at Step 2. Above and beyond from Time 1 baseline adherence (OR = 5.37, 95% CI 2.82 - 10.24,  $p < .001$ ) medication-specific support increased prediction of medication adherence at Time 2 ( $\Delta\chi^2$  (1,  $N = 236$ ) = 4.25,  $p < .05$ ). Medication-specific social support was and negatively related to later medication adherence (OR = 0.69, 95% CI 0.49 - 0.98,  $p < .05$ ).

In Step 3, we added the interaction between conflict and medication specific social support. Model fit improved ( $\Delta\chi^2$  (1,  $N = 236$ ) = 4.40,  $p < .05$ ), with OR = 0.42 (95% CI 0.17 - <1.00,  $p < .05$ ) for the interaction term.



*Figure 1.* Simple Slopes Analysis Depicting the Interaction between Medication-Specific Support and Social Conflict.

*Note.* Reported are probabilities to adhere to medication regimes and centred medication-specific social support values,  $N=236$ . Covariates were sex, age, education, number of medicines, health status, attitude towards medication, general received social support, social conflict, T1 = Time 1, T2 = Time 2. The average of social conflict was overall very low, which is why the depicted line for one standard deviation below the mean is out of the actual data range and has to be considered a theoretical trend only.

To determine the direction of this interaction effect, we used simple slopes analyses (Aiken & West, 1991). Figure 1 depicts the association of received medication-specific support at Time 1 with the likelihood of medication adherence at Time 2 at three levels of social conflict at Time 1 (-1 SD, Mean, +1 SD).

The simple slopes analyses revealed that the negative relation between medication support and medication adherence was significant only for individuals with high levels of social conflict (+1 SD). In individuals with moderate (M) or low levels (-1 SD) of social conflict, medication-specific social support was not significantly related to later medication adherence.

#### *Prediction of Adherence and Medication Support in Cross-Lagged Panel Analysis*

The correlations among adherence and medication specific support over time, given in Table 1, included a significant negative relationship between Time 1 adherence and Time 2 social support of precisely the same magnitude of the correlation between support at Time 1 and adherence at Time 2 ( $r=-.22$ ,  $p < .001$  in both cases). Medical support over time was somewhat

more stable ( $r=.54, p < .001$ ) than was adherence ( $r=.37, p < .001$ ). To examine the bidirectional relationships between support and adherence over time, controlling for stability of each construct we performed a cross-lagged panel analysis with medication adherence and medication-specific social support at both measurement points in time (see Figure 2). Covariates, specifically, sex, age, education, number of medicines, health status and attitude towards medication were controlled. They predicted Time 2 adherence and medication-specific support. With stability paths for adherence and medication-specific social support included. As already seen from the logistic regression analyses, initial medication support was negatively related to later adherence ( $\beta = -.19, p < .05$ ). Conversely, higher initial adherence was negatively related to later receipt of medication support medication-specific social support ( $\beta = -.12, p < .001$ ); put another way, low adherence was associated with higher support at a later time. This model explained 27% of the variance in medication adherence and 38% of the variance in medication-specific social support. To test whether the path between medication support Time 1 and adherence Time 2 and the path between adherence Time 1 and medication support Time 2 were significantly different, a second cross-lagged panel analysis was performed with these paths constrained to be equal. Chi square difference tests for these two models showed that the more restrictive model fitted the data as well as the model with freely estimated parameters ( $\Delta\chi^2(1) = 0.002, ns$ ). In sum, participants reported receiving more support, when they had been less adherent previously. However, they also reported that receiving medication-specific support had a negative relation to their later medication adherence. Apart from a positive relation between general social support and medication-specific support ( $\beta = .11, p < .001$ ), none of the other covariates had a significant relation to the outcomes.

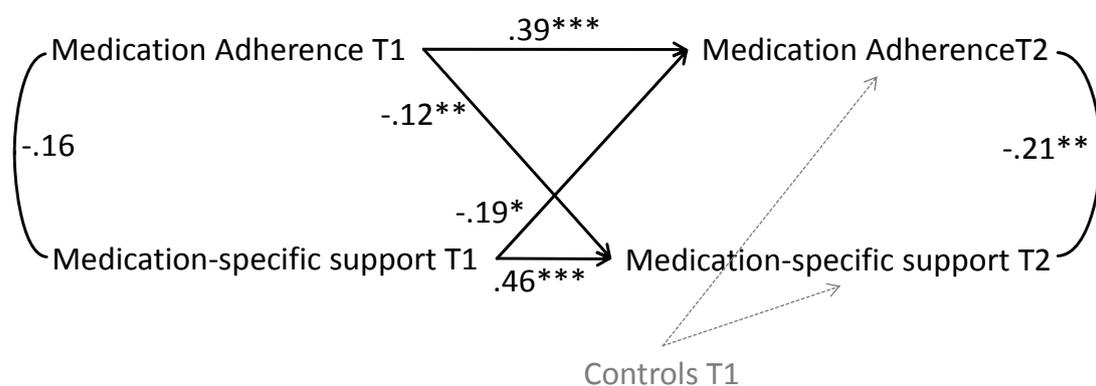


Figure 2. Cross-Lagged Panel Analysis.

Note. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ ,  $N=268$ . Covariates were sex, age, education, number of medicines, health status, attitude towards medication, general received social support, social conflict, T1 = Time 1, T2 = Time 2.

## Discussion

The impact of social resources on health and health behaviour in older adults has to be investigated carefully to find the fine line between those social resources that are helpful and those that might act as a double-edged sword (Revenson, et al., 1991). Former research on the social resources for medication adherence mainly investigated its association with general anticipated and general received social support (DiMatteo, 2004a). However, investigating behaviour-specific social support is of particular importance, as it might enable researchers to prompt social support more directly in interventions on medication adherence. Therefore, this study not only investigated general received social support and social conflict, but medication-specific social support as well. Unexpectedly, medication-specific social support emerged as the only significant predictor of medication adherence (apart from baseline medication adherence) and was negatively associated with it. That is to say, medication adherence was reported to be lower in those participants who reported higher levels of medication-specific social support at the earlier point in time and vice versa. In line with our findings, negative effects of received instrumental social support were found in the context of other health behaviours as well, such as exercise in women with osteoarthritis (Matire, Stephens, Druley, & Wojno, 2002), dietary changes in older men (Silverman, Hecht, & McMillin, 2002) and diet, medication, and exercise regimens in post-myocardial infarction patients (Burg & Seeman, 1994). However, these negative relations may as well be explained by the mobilization hypothesis, which posits that network members support those older adults in particular, for whom they perceive deficits in their health behaviours. The mobilization hypothesis hence claims that being worse off in the first place mobilizes more support from a network, which explains negative relations of receiving social support and positive outcomes (Väänänen, et al., 2005). However, in the long run, support is deemed to be beneficial according to this hypothesis. To investigate this possible alternative explanation, this study tested the mutual relation of medication-specific support and medication adherence over time and found that the constructs are reciprocally associated. On the one hand, participants reported receiving more medication-specific support when they were less adherent previously. On the other hand, more medication-specific social support was associated with later non-adherence, as well. How can that be? A prominent explanation for similar phenomena in research on received social support is that social support is not perceived as helpful if it coincides with social conflict (Liang, et al., 2001). In fact, the closest network members are often perceived to be major sources of social support, while they are major source of social conflict at the same time (Abbey, et al., 1985; Argyle & Furnham, 1983). In

detecting an interaction between social conflict and medication-specific social support in our sample of older adult with multiple chronic conditions, we confirmed that the negative relation between medication-specific social support and medication adherence can be traced to those individuals with high levels of social conflict. This is in line with previous research that showed that the impact of social support can be rendered negative, if too much social conflict is present (Liang, et al., 2001). For individuals with moderate and low levels of social conflict, however, the expected positive relation between medication support and medication adherence did not emerge. To investigate why participants with low levels of social conflict did not perceive received medication-specific support as helpful, future studies should incorporate personal resources such as medication adherence self-efficacy. Interactions between personal and social resources have explained the negative effects of received support in previous research (Warner, et al., 2011). The inclusion of measures of both overprotection and social control in future research may provide a more complete understanding of the mechanisms that underlie the negative link between support and adherence (Lewis & Rook, 1999; Thompson & Sobolew-Shubin, 1993).

#### *Limitations*

The results of our study are limited to older adults with multimorbidity - a group at high risk for medication non-adherence due to highly prevalent and complicated treatment regimes (Osterberg & Blaschke, 2005; Tinetti, et al., 2004). However, this means that the results cannot be generalized to other groups of chronically ill patients, such as AIDS or cancer patients, among whom received medication-specific support has been often found to facilitate medication adherence (DiMatteo, 2004a).

With regard to the measures in this study, future research would benefit from more complete characterization of the multiple sources of medication-specific social support. We asked participants to rate medication-specific support from family and friends only, as support from significant others seems to be more relevant in most domains of life (Hogan, Linden, & Najarian, 2002). However, health care providers comprise a fifth of overall support in previous studies on medication adherence (Hamilton, et al., 2007). Hence, it would be of great importance to assess medication-specific social support from health care providers in future research as well. Social conflict was measured with four very broad items, which makes it impossible to determine whether the medication-specific social support was indeed a source of conflict or whether the reported social conflict derived from different life domains or interaction partners. Future studies should assess in detail the identities of the major providers of medication-specific support and whether the

supporting behaviour per se leads to social conflict or whether social conflict is present for different reasons and beclouds the positively intended acts of the medication support provider. Furthermore, medication adherence was assessed via self-report. This might have led to overreporting, as adherence rates ranged between 68 and 70 percent in this study and could be due to a social desirability bias. However, previous comparative research showed that self-reported measures of adherence can be considered valid (Hansen, et al., 2009).

Even though we tried to exclude alternative explanations and showed in the cross-lagged panel analyses that medication-specific social support and medication adherence relate to one another reciprocally over time, causal assumptions can not be drawn from this longitudinal study and more adequate study designs (such as randomized controlled trials) are needed.

### *Implications*

Finding harmful effects of receiving support is quite common when older adults are the focus of research. On the one hand the need for social support grows with health deterioration, but on the other hand older adults often disapprove support in order to sustain their sense of self-esteem and autonomy (Fisher, Nadler, & Whitcher-Alagna, 1982; Warner, et al., 2010; Warner, et al., 2011). If this phenomenon is not explainable by alternative explanations – like the mobilization hypothesis – it is reasonable to examine the role of negative social experiences within the social network, including social conflict, overprotection, or social control. Such negative interplay between individuals may be a major source of the perception that support provided by others is not, in fact, supportive from the perspective of the recipient (Lewis & Rook, 1999; Thompson & Sobolew-Shubin, 1993).

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## **References**

- Abbey, A., Abramis, D. J., & Caplan, R. D. (1985). Effects of different sources of social support and social conflict on emotional well-being. *Basic and Applied Social Psychology*, 6, 111-129.

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Argyle, M., & Furnham, A. (1983). Sources of satisfaction and conflict in long-term relationships. *Journal of Marriage and the Family*, 45, 481-493.
- Bolger, N., & Amarel, D. (2007). Effects of social support visibility on adjustment to stress: Experimental evidence. *Journal of Personality and Social Psychology*, 92, 458-475.
- Brown, S. L., Nesse, R. M., Vinokur, A. D., & Smith, D. M. (2003). Providing social support may be more beneficial than receiving it: Results from a prospective study of mortality. *Psychological Science*, 14, 320-327.
- Burg, M. M., & Seeman, T. E. (1994). Families and health: The negative side of social ties. *Annals of Behavioral Medicine*, 16, 109-115.
- Burroughs, T. E., Pontious, S. L., & Santiago, J. V. (1993). The relationship among six psychosocial domains, age, health care adherence, and metabolic control in adolescents with IDDM. *The Diabetes Educator*, 19, 396-402.
- Charlson, M. E., Szatrowski, T. P., Peterson, J., & Gold, J. (1994). Validation of a combined comorbidity index. *Journal of Clinical Epidemiology*, 47, 1245-1251.
- Cook, N. R., Albert, M. S., Berkman, L. F., Blazer, D., Taylor, J. O., & Hennekens, C. H. (1995). Interrelationships of peak expiratory flow rate with physical and cognitive function in the elderly: MacArthur Foundation Studies of Aging. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, 50A, M317-M323. doi: 10.1093/gerona/50A.6.M317
- Cook, N. R., Evans, D. A., Scherr, P. A., Speizer, F. E., Taylor, J. O., & Hennekens, C. H. (1991). Peak expiratory flow rate and 5-year mortality in an elderly population. *American Journal Of Epidemiology*, 133, 784-794.
- DiMatteo, M. R. (2004a). Social support and patient adherence to medical treatment: a meta-analysis. *Health Psychology*, 23, 207-218.
- DiMatteo, M. R. (2004b). Variations in patients' adherence to medical recommendations: a quantitative review of 50 years of research. *Medical Care*, 42, 200-209.
- Doggrell, S. A. (2010). Adherence to medicines in the older-aged with chronic conditions: does intervention by an allied health professional help? *Drugs & Aging*, 27, 239-254.
- Everson-Rose, S. A., & Lewis, T. T. (2005). Psychosocial factors and cardiovascular diseases. *Annual Review of Public Health*, 26, 469-500.
- Fisher, J. D., Nadler, A., & Whitcher-Alagna, S. (1982). Recipient reactions to aid. *Psychological Bulletin*, 91, 27-54.
- Fortin, M., Dubois, M.-F., Hudon, C., Soubhi, H., & Almirall, J. (2007). Multimorbidity and quality of life: a closer look. *Health and Quality of Life Outcomes*, 5-52. doi: 10.1186/1477-7525-1185-1152
- Friedberg, J. P., Robinaugh, D., Ulmer, M. E., Antonopoulos, M. S., Sathe, N., & Natarajan, S. (2009). *Does comorbid cardiovascular disease affect anti-hypertensive medication*

- adherence?* Paper presented at the Health Services Research & Development Service, Baltimore.
- Gijzen, R., Hoeymans, N., Schellevis, F. G., Ruwaard, D., Satariano, W. A., & van den Bos, G. A. (2001). Causes and consequences of comorbidity: A review. *Journal of Clinical Epidemiology*, *54*, 661-674.
- Groll, D. L., To, T., Bombardier, C., & Wright, J. G. (2005). The development of a comorbidity index with physical function as the outcome. *Journal of Clinical Epidemiology*, *58*, 595-602.
- Haber, M. G., Cohen, J. L., Lucas, T., & Baltes, B. B. (2007). The relationship between self-reported received and perceived social support: A meta-analytic review. *American Journal of Community Psychology*, *39*, 133-144.
- Hamilton, M. M., Razzano, L. A., & Martin, N. B. (2007). The relationship between type and quality of social support and HIV medication adherence. *Journal of HIV/AIDS & Social Services*, *6*, 39-63.
- Hansen, R. A., Kim, M. M., Song, L., Tu, W., Wu, J., & Murray, M. D. (2009). Comparison of methods to assess medication adherence and classify nonadherence. *The Annals of Pharmacotherapy*, *43*, 413-422. doi: 10.1345/aph.1L496
- Hays, J., Saunders, W., Flint, E., Kaplan, B., & Blazer, D. (1997). Social support and depression as risk factors for loss of physical function in late life. *Aging & Mental Health*, *1*, 209-220.
- Hofmann, W. (2010). An extension of the MODPROBE macro for SPSS. Retrieved February 7th 2011, from [http://wilhelmhofmann.info/wordpress/?page\\_id=120](http://wilhelmhofmann.info/wordpress/?page_id=120)
- Hogan, B. E., Linden, W., & Najarian, B. (2002). Social support interventions: Do they work? *Clinical Psychology Review*, *22*, 381-440.
- Holt-Lunstad, J., Uchino, B. N., Smith, T. W., & Hicks, A. (2007). On the importance of relationship quality: the impact of ambivalence in friendships on cardiovascular functioning. *Annals of Behavioral Medicine*, *33*, 278-290.
- Horne, R., Weinman, J., & Hankins, M. (1999). The beliefs about medicines questionnaire: The development and evaluation of a new method for assessing the cognitive representation of medication. *Psychology & Health*, *14*, 1.
- Kadam, U. T., & Croft, P. R. (2007). Clinical multimorbidity and physical function in older adults: A record and health status linkage study in general practice. *Family Practice*, *24*, 412-419.
- Kikkert, M. J., Schene, A. H., Koeter, M. W. J., Robson, D., Born, A., Helm, H., et al. (2006). Medication adherence in schizophrenia: exploring patients', carers' and professionals' views. *Schizophrenia Bulletin*, *32*, 786-794.
- Lakey, B. (2010). Social support: Basic research and new strategies for intervention. In J. E. Maddux & J. P. Tangney (Eds.), *Social Psychological Foundations of Clinical Psychology* (pp. 177-194). New York: Guilford.
- Lakey, B., & Cohen, J. L. (2007). Social Support Assessment. In S. Ayers, A. Baum, C. McManus, S. Newman, K. Wallston, J. Weinman & R. West (Eds.), *Cambridge Handbook of Psychology, Health, & Medicine* (pp. 321-326). Cambridge, England: Cambridge University Press.

- Lakey, B., & Scoboria, A. (2005). The relative contribution of trait and social influences to the links among perceived social support, affect, and self-esteem. *Journal of Personality, 73*, 361-388.
- Lewis, M. A., & Rook, K. S. (1999). Social control in personal relationships: impact on health behaviors and psychological distress. *Health Psychology, 18*, 63-71.
- Liang, J., Krause, N. M., & Bennett, J. M. (2001). Social exchange and well-being: Is giving better than receiving? *Psychology and Aging, 16*, 511-523.
- Matire, L. M., Stephens, M. A. P., Druley, J. A., & Wojno, W. C. (2002). Negative reactions to received spousal care: Predictors and consequences of miscarried support. *Health Psychology, 21*, 167-176.
- Newsom, J. T. (1999). Another side to caregiving: negative reactions to being helped. *Current Directions in Psychological Science, 8*, 183.
- Osterberg, L., & Blaschke, T. (2005). Drug therapy: adherence to medication. *The New England Journal of Medicine, 353*, 487-497.
- Penninx, B. W. J. H., Van Tilburg, T., Deeg, D. J. H., & Kriegsman, D. M. W. (1997). Direct and buffer effects of social support and personal coping resources in individuals with arthritis. *Social Science & Medicine, 44*, 393-402.
- Psaty, B., Lee, M., Savage, P., Rutan, G., German, P., & Lyles, M. (1992). Assessing the use of medications in the elderly: methods and initial experience in the Cardiovascular Health Study. *Journal of Clinical Epidemiology, 646*, 683-692.
- Ramm, G. C., & Hasenbring, M. (2003). Die deutsche Adaptation der Illness-specific Social Support Scale und ihre teststatistische Überprüfung beim Einsatz an Patienten vor und nach Knochenmarktransplantation [The German adaptation of the Illness-specific Social Support Scale and the test statistical evaluation on the basis of patients undergoing bone marrow transplantation]. *Zeitschrift für Medizinische Psychologie, 12*, 29-38.
- Reich, J. W., & Zautra, A. J. (1995). Spouse encouragement of self-reliance and other-reliance in rheumatoid arthritis couples. *Journal of Behavioral Medicine, 18*, 249.
- Revenson, T. A., Schiaffino, K. M., Majerovitz, S. D., & Gibofsky, A. (1991). Social support as a double-edged sword: The relations of positive and problematic support to depression among rheumatoid arthritis patients. *Social Science & Medicine, 33*, 807-813.
- Salehi, L., Eftekhar, H., Mohammad, K., Tavafian, S. S., Jazayery, A., & Montazeri, A. (2010). Consumption of fruit and vegetables among elderly people: a cross sectional study from Iran. *Nutrition Journal, 9*, 2-2.
- Sallis, J. F., Grossman, R. M., Pinski, R. B., Patterson, T. L., & Nader, P. R. (1987). The development of scales to measure social support for diet and exercise behaviors. *Preventive Medicine, 16*, 825-836.
- Sayers, S. L., White, T., Zubritsky, C., & Oslin, D. W. (2006). Family involvement in the care of healthy medical outpatients. *Family Practice, 23*, 317-324.

- Schafer, L. C., Glasgow, R. E., McCaul, K. D., & Dreher, M. (1983). Adherence to IDDM regimens: relationship to psychosocial variables and metabolic control. *Diabetes Care*, *6*, 493-498.
- Schwarzer, R., & Knoll, N. (2007). Functional roles of social support within the stress and coping process: A theoretical and empirical overview. *International Journal of Psychology*, *42*, 243-252.
- Schwarzer, R., & Leppin, A. (1991). Social support and health: A theoretical and empirical overview. *Journal of Social and Personal Relationships*, *8*, 99-127.
- Seeman, T. E., Bruce, M. L., & McAvay, G. J. (1996). Social network characteristics and onset of ADL disability: MacArthur studies of successful aging. *Journals of Gerontology: Series B: Psychological Sciences and Social Sciences*, *51*, 191-200.
- Silverman, P., Hecht, L., & McMillin, J. D. (2002). Social support and dietary change among older adults. *Ageing & Society*, *22*, 29.
- Simpson, S. H., Eurich, D. T., Majumdar, S. R., Padwal, R. S., Tsuyuki, R. T., Varney, J., et al. (2006). A meta-analysis of the association between adherence to drug therapy and mortality. *British Medical Journal*, *333*. doi: 10.1136/bmj.38875.675486.675455
- Smith, J., & Goodnow, J. J. (1999). Unasked-for support and unsolicited advice: Age and the quality of social experience. *Psychology and Aging*, *14*, 108-121.
- Stevens, M., Lemmink, K. A. P. M., van Heuvelen, M. J. G., de Jong, J., & Rispens, P. (2003). Groningen Active Living Model (GALM): Stimulating physical activity in sedentary older adults; validation of the behavioral change models. *Preventive Medicine*, *37*, 561-570.
- Stirratt, M. J., Remien, R. H., Smith, A., Copeland, O. Q., Dolezal, C., & Krieger, D. (2006). The role of HIV serostatus disclosure in antiretroviral medication adherence. *AIDS and Behavior*, *10*, 483-493.
- Thompson, S. C., & Sobolew-Shubin, A. (1993). Perceptions of overprotection in ill adults. *Journal of Applied Social Psychology*, *23*, 85-97.
- Tinetti, M. E., Bogardus, S. T., & Agostini, J. V. (2004). Potential pitfalls of disease-specific guidelines for patients with multiple conditions. *New England Journal of Medicine*, *351*, 2870-2874. doi:10.1056/NEJMs042458
- Uchino, B. N. (2009). Understanding the links between social support and physical health: A life-span perspective with emphasis on the separability of perceived and received support. *Perspectives on Psychological Science*, *4*, 236-255.
- Uchino, B. N., Cacioppo, J. T., & Kiecolt-Glaser, J. K. (1996). The relationship between social support and physiological processes: A review with emphasis on underlying mechanisms and implications for health. *Psychological Bulletin*, *119*, 488-531.
- Unesco. (1997). International Standard Classification of Education. Retrieved February 7th 2011, from <http://www.uis.unesco.org/publications/ISCED97>
- Väänänen, A., Vahtera, J., Pentti, J., & Kivimäki, M. (2005). Sources of social support as determinants of psychiatric morbidity after severe life events: Prospective cohort study of female employees. *Journal of Psychosomatic Research*, *58*, 459-467.

- van den Akker, M., Buntinx, F., Metsemakers, J. F., Roos, S., & Knottnerus, J. A. (1998). Multimorbidity in general practice: Prevalence, incidence, and determinants of co-occurring chronic and recurrent diseases. *Journal of Clinical Epidemiology*, *51*, 367-375.
- Warner, L. M., Schüz, B., Wurm, S., Ziegelmann, J. P., & Tesch-Römer, C. (2010). Giving and taking – differential effects of providing, receiving and anticipating emotional support on quality of life in adults with multiple illnesses. *Journal of Health Psychology*, *15*, 660-670. doi: 10.1177/1359105310368186
- Warner, L. M., Ziegelmann, J. P., Schüz, B., Wurm, S., & Schwarzer, R. (in press). Interaction between Social Support and Self-Efficacy on Physical Exercise in Older Adults. *Journal of Aging and Physical Activity*.
- Warner, L.M., Ziegelmann, J. P., Schüz, B., Wurm, S., Tesch-Römer, C., & Schwarzer, R. (2011). Maintaining autonomy despite multimorbidity: Self-efficacy and the two faces of social support. *European Journal of Ageing*, *8*, 3-12. doi: 10.1007/s10433-011-0176-6
- Wurm, S., Tomasik, M. J., & Tesch-Römer, C. (2010). On the importance of a positive view on ageing for physical exercise among middle-aged and older adults: Cross-sectional and longitudinal findings. *Psychology & Health*, *25*, 25 - 42.
- Zautra, A. J., Reich, J. W., & Newsom, J. T. (1995). Autonomy and sense of control among older adults: An examination of their effects on mental health. In L. Bond, S. Cutler & A. Grams (Eds.), *Promoting Successful and Productive Aging* (pp. 153–170). Newbury Park, CA: Sage.
- Zivin, K., Ratliff, S., Heisler, M. M., Langa, K. M., & Piette, J. D. (2010). Factors influencing cost-related nonadherence to medication in older adults: a conceptually based approach. *Value in Health*, *13*, 338-345.

# 7

## General Discussion

## General Discussion

### *Introduction*

The major aim of this thesis was to identify social resources and risk factors for quality of life, autonomy and health behaviours of older adults with multiple chronic illnesses – a disadvantaged and under-researched population. Multimorbidity adds to the normative declines the ageing process already involves – such as the reduction of social roles and activities – by bringing about health constraints that interfere with daily life, frequent health care utilisation, premature disability and reduced life expectancy (Baltes & Silverberg, 1994; 2004; Kadam & Croft, 2007). Moreover, older adults with multiple illnesses frequently struggle to maintain their quality of life and autonomy (Fortin, et al., 2006; Sibley, et al., 2006). They often need social support to manage activities of daily life and to cope with the limitations of multiple diseases. However, accepting help is not always easy. Older adults with chronic diseases may perceive support as an additional burden, especially if they are limited in such a way that leaves them no choice for whether they want to be supported or not (Roe, Whattam, Young, & Dimond, 2001). As a result of receiving support, individuals may feel dependent, indebted, inferior and guilty (Newsom & Schulz, 1998; Silverstein, Xuan, & Heller, 1996). Those negative emotions, in turn, often entail reduction of quality of life and perceptions of autonomy. Therefore, this thesis investigated how receiving support affects older adults with multimorbidity. The empirical chapters in this thesis focused on the identification of social interactions that act as the so called “*double edged sword*” (Revenson, Schiaffino, Majerovitz, & Gibofsky, 1991). To further the field of social support research, this thesis adopted a highly detailed perspective on social support constructs. Helpful and unhelpful *types* of support were distinguished and *conditions* and *mechanisms* were investigated that explain under which circumstances receiving support may be beneficial. Finally, strategies on how to avoid or reduce negative effects of receiving social support in older adults were elaborated. This thesis provides accumulated knowledge, which may inform future interventions to facilitate older adult’s efforts to maintain quality of life and autonomy despite the various health challenges they encounter. The main findings of this thesis are summarised in Table 1.

Figure 4 further illustrates the assumed links between social resources and outcomes that were investigated in this thesis. The most general outcome levels were perceptions of autonomy and quality of life, which were thought to be affected by more general measures of social resources.

Table 1. Summary of the Findings in the Thesis

Aims	Findings	Conclusions
<i>Chapter 2</i> examined the differential effects of providing, receiving and anticipating emotional social support on quality of life in adults with multiple illnesses and investigated self-esteem and control beliefs as possible mechanisms.	Anticipating and providing support positively predicted quality of life, mediated via self-esteem and control beliefs. Received support negatively predicted quality of life, without mediation.	Anticipating support seemed to exert its beneficial effects on quality of life via enhanced self-esteem and control beliefs, confirming its close relation to self-evaluative cognitions. The <i>helper therapy principle</i> was also confirmed, which posits that helping others boosts self-esteem and control beliefs in the provider. The results for received support were in contrast to the <i>social breakdown</i> and <i>failed individual coping theory</i> , as the negative effects of received support were not due to decreases in control beliefs and self-esteem. Hence, alternative mechanisms for the negative effects of receiving support such as the <i>mobilisation hypothesis</i> , <i>self-evaluative cognitions</i> as moderators or co-occurrence of <i>social conflict</i> need to be investigated.
<i>Chapter 3</i> . As autonomy may be maintained by delegating tasks to others, the aim of Chapter 3 was to investigate the interplay of self-efficacy and received instrumental social support on autonomy in older adults with multimorbidity.	Cross-sectionally, participants reported higher social support when they perceived lower autonomy. Longitudinally, participants <i>high</i> in self-efficacy, who additionally received support, perceived lower autonomy. However, received support helped to maintain autonomy in participant with <i>lower</i> self-efficacy.	The cross-sectional negative effects of receiving support might be explained by the <i>mobilisation hypothesis</i> . However, the longitudinal null-effect needed investigation of a possible moderator. Longitudinally, receiving instrumental support was positive for individuals with <i>low</i> self-efficacy only - supporting the <i>compensation hypothesis</i> . For individuals with <i>high</i> self-efficacy, the self-efficacy and social support interfered and threatened autonomy longitudinally, supporting the <i>interference hypothesis</i> . Health behaviours, such as exercise and medication adherence, should be investigated as a possible <i>behavioural pathway</i> between social support and health in older adults with multiple illnesses.
<i>Chapter 4</i> examined whether self-efficacy and received social support for exercise affect exercise in a compensatory and interfering way similar to Chapter 3, or whether they act synergistically.	Participants with low exercise self-efficacy were less likely to be active in spite of having social support for exercise. Participants with low support were less likely to be active even if they were high in self-efficacy.	Receiving social support had positive effects on exercise behaviour in older adults with multimorbidity. This effect was even stronger, when participants held high exercise self-efficacy beliefs – suggesting a <i>synergistic effect</i> . Both resources should be targeted in efforts to increase older adults' exercise. In order to find ways how to promote the highly relevant personal resource of exercise self-efficacy, its sources should be examined.
<i>Chapter 5</i> . The aim of this Chapter was to investigate the four sources of exercise self-efficacy in older adults with multimorbidity.	Past experiences, vicarious experiences, and subjective health had significant direct effects on self-efficacy and indirect effects on exercise via self-efficacy. Persuasive arguments did not predict exercise-specific self-efficacy.	Social support did not only affect exercise behaviour directly, it also enhanced self-efficacy beliefs for exercise – a crucial resource for older adult's exercise behaviour. However, the type of support makes a difference: Whereas companionship support (vicarious experience) can be highly recommended from the results of this chapter, verbal persuasion affected neither self-efficacy nor exercise, corroborating previous research. To test whether the positive effects of exercise-specific support occur only due to closely related measurement of support and outcome, other health behaviours should be investigated.
<i>Chapter 6</i> tested the impact of general received social support, medication-specific social support and social conflict on medication adherence in older adults with multimorbidity.	Participants, who received high medication-specific support showed lower medication adherence over time. However, this only applied to participants with high levels of social conflict.	Whereas medication-specific social support was negatively related to medication adherence, general support did not predict the latter health behaviour. Cross-sectionally, this negative relation could be explained by the <i>mobilisation hypothesis</i> . Longitudinally, only participants who reported high social conflict, perceived medication support to be adverse for their medication adherence.

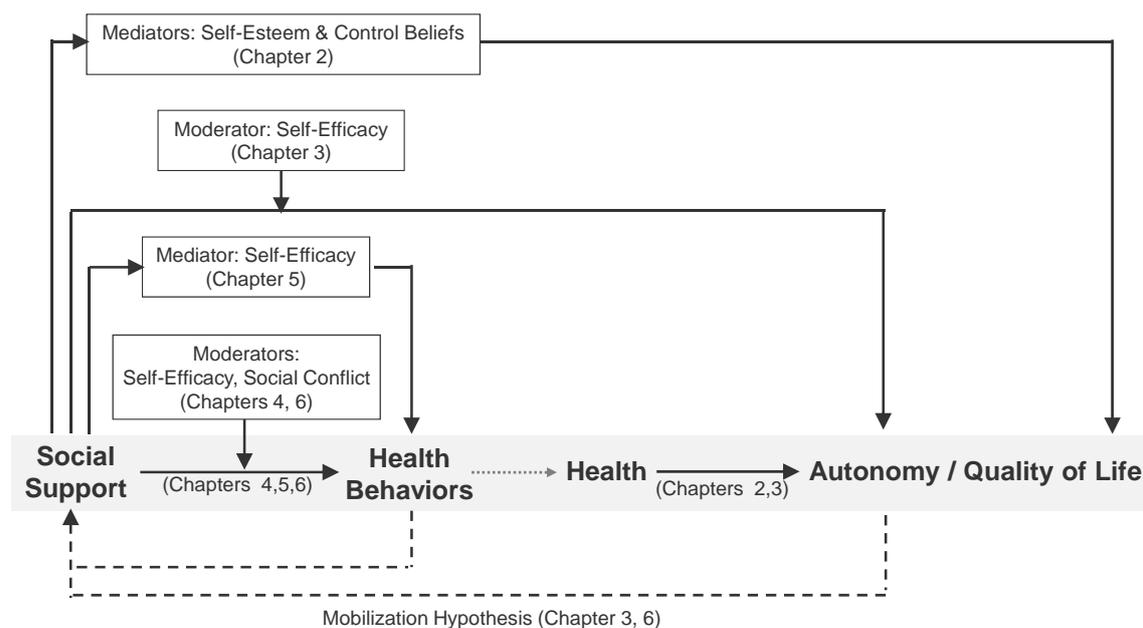


Figure 4. Paths Investigated within this Thesis

Note. Solid lines and dashed lines reflect paths that were investigated within this thesis; the dotted path was not tested within this thesis.

Associations between receiving social support with quality of life (Chapter 2) and autonomy (Chapter 3) were investigated directly as well as indirectly via the *psychological pathway*, assuming self-referent cognitions to mediate these effects. To investigate more specific outcomes, the impact of behaviour-specific received social support on exercise behaviour (Chapters 4, 5) and medication adherence (Chapter 6) were tested as the *behavioural pathway*. Since there is consistent evidence that health behaviours play a crucial role in maintaining older adult's *health status* (Hinrichs & Trampisch, 2010), this thesis did not investigate the complete causal chain depicted in Figure 4, but rather focused on associations of social resources health behaviours, quality of life and autonomy.

### Summary

As a first step, this thesis examined the comparative effects of *anticipating*, *providing* and *receiving* social support on physical and mental quality of life in older adults with multimorbidity. Corroborating previous research, participants were found to profit from *anticipating* emotional support to be available if needed in terms of their mental and physical quality of life (Kriegsman, Penninx, & van Eijk, 1995). As the effects of anticipating support had not been tested in adults with multimorbidity before, this study adds to the ample evidence on beneficial findings for anticipating support, even in individuals with a high burden of disease (Brummett, et al., 2005; Finch, Okun, Pool, & Ruehlman, 1999). Since self-referent cognitions are assumed to be responsible for the link between anticipating support and positive outcomes, self-esteem and control beliefs were tested as

simultaneous mediators between anticipating support and quality of life (Berkman & Glass, 2000; Brand, Lakey, & Berman, 1995; Pearlin, Menaghan, Morton, & Mullan, 1981; Sarason, Levine, Basham, & Sarason, 1983). In previous research, both cognitions had been tested separately, which does not allow conclusions to be drawn as to, whether they act in concert or whether one of them is a better mediator than the other (Bisconti & Bergeman, 1999; Dunkel-Schetter, Bennett, Sarason, Sarason, & Pierce, 1990). Chapter 2 established evidence that self-esteem and control-beliefs both constitute psychological pathways from anticipating support to health and well-being (Saltzman & Holahan, 2002). Studies that attempted to promote the anticipation of support in interventions, however, conclude that it might be easier to intervene on self-referent cognitions directly, as *anticipating* support is less proximal to health and well-being (Brand, et al., 1995). Therefore, this thesis focused on *receiving* support rather than anticipating support.

In addition the results of Chapter 2 emphasise the beneficial effects of *providing* support. As suggested in previous research, self-esteem and control beliefs were analysed concurrently in this chapter to reveal the psychological mechanisms behind the positive effects of helping on quality of life (Krause, Herzog, & Baker, 1992). Both self-referent cognitions were found to mediate the relation between providing support and quality of life. Hence, together with the ample evidence from previous research, the conclusion can be drawn that even persons with multiple chronic conditions profit from providing emotional support, as this boosts their self-esteem and control-beliefs (Oman, Thoresen, & McMahan, 1999).

While positive effects of *anticipating* and *providing* support are well established, research on receiving support has delivered equivocal findings (Uchino, 2009). Therefore, this thesis primarily focused on *receiving* support, which is often referred to as a “double edged sword” or “mixed blessing” (Fisher, Nadler, & Whitcher-Alagna, 1982; Revenson, et al., 1991). The often occurring disparate effects of receiving support also emerged in this thesis. Three Chapters (2, 3, 6) found receiving support to produce mainly negative effects, whereas two Chapters (4, 5) reported receiving support to be beneficial. Therefore, the following sections of this thesis first summarise the negative and positive effects found for receiving support. Then conditions and mechanisms that may explain these disparate results were elaborated on.

#### *Negative Effects of Receiving Social Support*

In contrast to the positive effects of anticipating and providing support, *Chapter 2* found that *receiving* emotional social support was negatively associated with mental as well as physical quality of life, corroborating previous research on the frequently occurring negative effects of receiving social support (Bolger & Amarel, 2007; Newsom & Schulz, 1998). Furthermore, received

support was found to be inversely related to self-esteem in Chapter 2. In other words, the higher the received support the lower the reported self-esteem. As Chapter 2 investigated these associations cross-sectionally, the mobilisation hypothesis could not be excluded as an alternative explanation for the “adverse effects” of receiving support, because the mobilisation hypothesis assumes individuals with greater needs (e.g., lower quality of life or self-esteem) to receive more social support as a consequence of their needs.

Therefore, *Chapter 3* tested the relation between *received* instrumental support and perceptions of autonomy cross-sectionally and over time. Results indicated, that there was a negative relationship, cross-sectionally. Longitudinally, however, a reduction in autonomy was only evident in individuals with high levels of self-efficacy, who also received high levels of instrumental support (see interference hypothesis). *Chapter 6* also found that older adults with multimorbidity did not always profit from receiving support, as receiving *medication-specific support* was negatively related to medication adherence over time.

To sum up, different types of received support were found to negatively relate to more general outcomes, e.g., quality of life and autonomy, and more specific outcome, e.g., self-esteem and medication adherence. However, not all participants were affected by these processes in the same way. Consequently, these findings need to be put into perspective. After a brief summary of the *positive* effects of receiving support that were found in this thesis, conditions and support types, which make older adults resistant to experiencing detrimental effects of receiving support, will be elaborated.

#### *Positive Effects of Receiving Social Support*

Although result of *Chapter 3* indicate detrimental effects of being supported cross-sectionally as well as longitudinally (for the group of high self-efficacious individuals), it also revealed that receiving support may be beneficial, as it facilitated autonomy in participants, who reported to have low self-efficacy (see compensation hypothesis).

*Chapter 4 and 5* investigated exercise behaviour, as one crucial *behavioural* pathway from social resources to health in older individuals with multiple chronic illnesses. Both chapters found that participants, who were provided with offers from their social networks to exercise together, indeed exercised more frequently when compared with those, who had less companionship support. This corroborates previous research (Chogahara, O'Brien Cousins, & Wankel, 1998; Orsega-Smith, Payne, Mowen, Ho, & Godbey, 2007).

However, even for the positive effects found in these three chapters, types and preconditions of support need to be taken into account. For example, in Chapter 5, companionship support was a

better predictor of exercise self-efficacy and exercise behaviour than verbal persuasion. Furthermore, Chapter 3 found that not all participants profited from receiving general instrumental support for the maintenance of their autonomy (compensation versus interference hypothesis).

#### *Evaluation of Theories to Explain the Disparate Effects of Received Social Support*

##### *Mobilisation Hypothesis*

The most prominent alternative explanation to the assumption, that receiving support indeed has adverse effects, is the mobilisation hypothesis. This hypothesis assumes that receiving support does not lead to limitations in quality of life and autonomy, but that those individuals, who are worse off (e.g., have lower quality of life), mobilise more support from their networks (Barrera, 1986). Negative life events such as the onset of a chronic disease, are assumed to activate social networks, to providing more support to the person in need. The mobilisation hypothesis hence assumes that receiving support is a consequence of being ill or stressed, and that receiving help per se is beneficial (Väänänen, Vahtera, Pentti, & Kivimäki, 2005). Consequently, receiving support should show its potentially positive effects in longitudinal investigations (Schwarzer & Leppin, 1991). Since the mobilisation hypothesis could not be ruled out as an alternative explanation for the findings of Chapter 2, as its design was cross-sectional, Chapter 3, 4, 5 and 6 investigated the effect of receiving social support over time. Thereby Chapter 3 and 6 found negative relationships, whereas Chapter 4 and 5 found positive associations of receiving support. For these disparate effects, this thesis could not definitely rule out the alternative explanation of mobilisation effects as a consequence of low health behaviour or low quality of life and autonomy. Previous research, however, suggests that the amount of received support does not increase after the onset of illnesses (Väänänen, et al., 2005). In addition, ample evidence exists for the adverse effects of receiving support in longitudinal analyses (Silverstein, et al., 1996). A test for spuriousness further showed that it is more likely that receiving support indeed exerts adverse effects, rather than that stressors cause higher levels of received support (Seidman, Shrout, & Bolger, 2006).

##### *Matching Hypothesis*

Another rather methodological explanation for the negative effects of receiving support is the matching hypothesis. It predicts that support is less efficient and at times may be even detrimental when it does not match the needs of the recipient (Cutrona, 1990; Horowitz, et al., 2001). Support that is received for a particular stressor or health behaviour is therefore assumed to be more predictive and positively related to coping with that stressor or the performance of the specific behaviour (De Vries, Kremers, Smeets, & Reubsaet, 2008; Eyster & Brownson, 1999;

Thrasher, Campbell, & Oates, 2004). Chapter 4 and 5 support this assumption, because receiving more exercise-specific social support led to a higher frequency of exercise in older adults with multiple illnesses. This effect was even stronger, when participants held high self-efficacy beliefs for exercise (*Chapter 4*), corroborating previous research on the importance of self-efficacy beliefs for older adult's exercise behaviour (Edward McAuley, et al., 2005; E. McAuley, Jerome, Marquez, Elavsky, & Blissmer, 2003). In Chapter 5, exercise specific support did not only directly affect exercise frequency, but also indirectly via exercise self-efficacy. This mediating role of self-efficacy between exercise support and exercise corroborates findings from previous studies (Hankonen, Absetz, Ghisletta, Renner, & Uutela, 2010).

From the results of Chapter 4 and 5, one might conclude that finding positive effects of receiving support is more likely, if received support measures are specific with regard to the outcome. However, Chapter 6 falsifies this view, because the assessment of medication-specific social support related negatively to medication adherence and measures of general received support did not relate to the behaviour either. If social support constructs, that are measured closely related to the outcome, affect two health behaviours in opposite directions, it is reasonable to suggest that the matching hypothesis is not sufficient to explain these disparate results. Therefore, the question arises whether the qualitatively distinct outcomes per se caused the effects.

#### *The Outcome Makes the Difference*

As exercise behaviour and medication adherence pose qualitatively distinct challenges to older adults, receiving support for these two health behaviours may be perceived differently as well. To shed light on the disparate effects, this thesis found for exercise-specific support and medication-specific support, the meaning of medication adherence and exercise behaviour for older adults with multiple morbidities needs to be understood.

Medication adherence is a behaviour that leaves little choice for those whose health status is dependent on their medication. Especially for adults with multiple chronic illnesses, medication regimes are often complex and the majority of them needs to take medication several times a day (Tinetti, Bogardus, & Agostini, 2004). Taking medication constantly reminds patients of their bad health status (Veinot, et al., 2006), often makes them feel ashamed of having to take medication that frequently and interrupts their every day life (Goetzmann, et al., 2006; van den Donk, Gorter, & Rutten, 2010). Therefore, individuals with chronic illnesses often perceive their prescribed medication as something forced on them and threatening their autonomy (Hazzard, Hutchinson, & Krawiecki, 1990; Williams, Freedman, & Deci, 1998). With these limitations in mind, it makes it easier to understand why individuals with multiple chronic illnesses do not respond positively

when they are encouraged or reminded to take their medicine. Furthermore, taking ones medication may be perceived as a simple behaviour that does not need special social support (as opposed to more complex health behaviours), which makes it more likely that medication-specific social support evokes reactance (Moran, Christensen, & Lawton, 1997).

Exercise behaviour, on the other hand, leaves older adults the freedom of deciding on the type and timing of their activity. Thus, engaging in exercise behaviour may foster perceptions of autonomy in older adults (Andersen, Crespo, Bartlett, Cheskin, & Pratt, 1998). In addition, exercise behaviour renders possibilities for enjoyment and opportunities to socialise (Shores & West, 2010). Hence, having exercise-specific support, such as an active companion, may match the needs of older adults with multiple chronic conditions, as it makes exercising safer, more sociable and enjoyable (Gordon, Zizzi, & Pauline, 2004; Granner, Sharpe, Hutto, Wilcox, & Addy, 2007). Furthermore, older adults were found to prefer to exercise together with a partner (Clark, 1996; Wallace, Raglin, & Jastremski, 1995).

On the one hand, medication adherence is less time-consuming than exercise behaviour and therefore easier to implement into a daily routine. However, on the other hand, older adults usually hold more positive attitudes toward exercise than medication adherence, which is why they might be more inclined to accept help for exercise (Fraenkel & Fried, 2008). In sum, finding exercise companions for older adults with multiple chronic illnesses appears to be a good strategy to enhance exercise behaviour that in turn showed to improve autonomy and quality of life in previous research (Gillison, Skevington, Sato, Standage, & Evangelidou, 2009; Landi, et al., 2007; Netz, Wu, Becker, & Tenenbaum, 2005).

This thesis found significant adverse effects of receiving support not only on medication adherence, but on quality of life and autonomy as well. As methodological issues (mobilisation hypothesis, matching measurement) could be excluded as explanations, alternative “*real life*”-mechanisms need to be consulted. Several hypotheses for the negative effects of receiving support have been suggested, however, evidence is still inconclusive (Bracke, Christiaens, & Verhaeghe, 2008). Therefore, Chapters 2, 3 and 6 tested the social breakdown, failed individual coping, interference, compensation and social conflict approach, consecutively.

*Social Breakdown and Failed Individual Coping Theory - Personal Resources as Mediators*

The aim of Chapter 2 was to explain the detrimental effects of receiving social support with the social breakdown and failed individual coping hypothesis, respectively. Social breakdown theory (Bengtson & Kuypers, 1985) assumes that older individuals experience a depletion of beliefs in one's own *personal competencies*, such as control beliefs or self-efficacy when they receive support. The failed individual coping theory predicts that receiving support may be interpreted as a failure of one's own coping efforts and thus poses a threat to one's *self-esteem* (Bolger, Zuckerman, & Kessler, 2000; Eckenrode & Wethington, 1990; Revenson, Wollman, & Felton, 1983; Wethington & Kessler, 1986). So far, both hypotheses have only been tested separately. Chapter 2 aimed to close this gap by testing them as comparative mediators in the received support – quality of life relation. In contrast to both theories and previous research, the results of this thesis revealed that received support was not negatively related to control beliefs (Bengtson & Kuypers, 1985; Bolger, et al., 2000; Glaser, 2007; Wethington & Kessler, 1986). Participants, who received higher levels of support, reported lower self-esteem. However, lower levels of self-esteem were not associated with lower quality of life. To sum up, neither self-esteem nor control beliefs mediated the detrimental effect of receiving support on quality of life as presented in Chapter 2. However, research on the interplay of social resources has shown that these “threat to self-referent cognitions”-approaches do not represent the whole picture. The mechanisms between receiving support, personal resources and detrimental health and well-being may be more than just a one-way street. In other words, personal and social resources may also interact with each other (Schröder, 1997). Therefore, two further possible explanations for the adverse effects of receiving support on health outcomes were tested in Chapter 3.

*Interference and Compensation Hypothesis - Personal Resources as Moderators*

As the two mediator hypotheses could not be supported empirically by the results of this thesis, the following Chapter 3 adopted a moderator perspective by testing the compensation and interference hypothesis (Schröder, 1997). Self-efficacy was assumed to moderate the received support – autonomy association. This approach was more successful in explaining adverse effects of receiving support: Receiving social support was only helpful for participants with low levels of self-efficacy (compensation), whereas having high social support in addition to high self-efficacy beliefs diminished perceptions of autonomy (interference). Individuals with low self-efficacy hence profited from receiving support as they compensated their lack in self-efficacy with social support to maintain perceptions of autonomy. However, in individuals with high levels of self-efficacy,

personal and social resources interfered, as they perceived social support threatening their sense of autonomy.

This moderating role of self-efficacy on the link between receiving support and adjustment to illnesses supports previous research: Consistent with the interference hypothesis, patients, who were recovering from heart surgery and were physically disabled, preferred to receive less support when they had high levels of self-efficacy (Newsom & Schulz, 1998; Schröder, 1997). However, individuals with low levels of self-efficacy were more likely to cope with cancer (Aymanns, 1992), rheumatoid arthritis (Reich & Zautra, 1995) and heart surgery (Schröder, 1997) when they received support, adding evidence for the compensation hypothesis.

Literature and the results from this thesis thereby support Ryan's and Deci's (2008) conceptualisation of autonomy. More specifically, they assume that, if individuals have restricted personal resources that limit their freedom of choice, outside help can re-establish autonomy. This so called *selective-dependence* is, however, only helpful for individuals with insufficient personal resources (Bandura, 1997). Consequently, for participants with high levels of personal resources, outside help may restrict their sense of autonomy (Schröder, 1997).

In line with previous research, Chapter 2 and 3 offer support to the notion that levels of personal resources are not a consequence of received social support (no mediators) as assumed by the *psychological pathway* (Berkman & Glass, 2000), but rather the preconditions (moderators) that determine, whether individuals with chronic diseases are willing to accept help, or whether being supported undermines their efforts to stay autonomous.

#### *The Social Conflict Approach*

Another explanation for the negative effects of receiving support in older adults is the co-occurrence or maybe even provocation of social conflict by the mere fact that they receive social support (Holt-Lunstad, Uchino, Smith, & Hicks, 2007). Therefore, Chapter 6 investigated the direct impact of social conflict on medication adherence and the moderating effect of social conflict on the relation between received support with medication adherence. Even though, social conflict did not directly relate to adherence, the negative effect of receiving support for adherence was moderated by social conflict. Specifically, participants, who reported high levels of social conflict, experienced negative effects on their medication adherence, when they received medication specific support. For participants with low social conflict, the negative relationship between being supported and adherence vanished. However, this relationship did not turn into a positive effect. Hence, being supported for one's medication adherence did not affect adherence behaviour in those participants, who had low social conflict. However, for persons with high social conflict, medica-

tion-specific support turned out to be negative for their adherence. To conclude, the experience of high levels of social conflict made the negative impact of receiving support stronger, thus corroborating previous research (Holt-Lunstad, et al., 2007). Since social conflict is very likely to occur in older adults lives (Krause & Rook, 2003), the interplay of receiving support with social conflict is a further possible explanation for the sometimes occurring adverse effects of received support on health outcomes in this population.

*Received Support: The Type, Source and Sample Make a Difference*

Chapter 4 and 5 demonstrated that receiving exercise-specific support positively relates to older adults' exercise frequency. However, not all studies that investigate social support for exercise result in such positive conclusions. Thus, the impact of further factors should be considered.

In a study by Okun et al. (2003), companionship support for exercise was inversely related to exercise. The authors hypothesised, that having the opportunity to exercise with another person, might undermine exercise efforts, as some individuals do not want to socialise while exercising. However, Okun's sample consisted of adolescents (i.e. college students), pointing to differential effects of companionship support for exercise in *different age groups* or *groups with different health states*.

A meta-analytic review by Van Stralen et al. (2009) also found social support from sports partners to be effective for exercise behaviour of older adults, whereas support from health care providers, such as general practitioners or nurses, was reported to interfere with exercise ambitions. Such preferences for specific sources of social support were also found in analyses that preceded Chapter 4 (not reported). These analyses revealed that exercise-specific support from family members was less effective than exercise support from friends, corroborating previous *source-preferences* for exercise support in older adults (Resnick, Orwig, Magaziner, & Wynne, 2002; Stevens, Lemmink, van Heuvelen, de Jong, & Rispens, 2003). Consistent with previous research (Ashford, Edmunds, & French, 2010), Chapter 5 further demonstrated that verbal persuasion, as a *type* of exercise-specific support, did not affect exercise behaviour. The ineffectiveness of exercise-specific verbal persuasion indicated that even specifically measured constructs such as exercise support need to be further differentiated to identify the active ingredients; in the case of this thesis – companionship support.

To sum up, this thesis demonstrates that exercise-specific support is beneficial for exercise engagement. Results of this thesis further suggest that this positive effect is dependent on the *type* and *source* of support. Older adults with multiple illnesses only profited from support from their

friends (not family) and from received companionship support (not persuasion). Further, previous research suggests that these preferences cannot be transferred to younger or healthier populations.

#### *Future Directions and Implications for Research*

##### *Methods of Analysis*

Apart from the linear negative association between received support, quality of life, autonomy and medication adherence found in Chapters 2, 3 and 6, *curvilinear relations* between receiving support and outcomes are possible as well. Silverstein et al. (1996), for example, found that low to moderate levels of received support decreased depressive symptoms, whereas, high levels of support in turn increased depressive symptoms. Taking such quadratic trends into consideration will allow elaborating further explanations for the differential effect of receiving support in future research.

The *moderated mediation approach* (Preacher, Rucker, & Hayes, 2007) is another option to investigate the psychological pathways linking receiving support to health outcomes. Chapter 2 found received support to affect self-esteem negatively. Chapter 3 found that receiving support is adverse in individuals with high self-efficacy only. Thus, the question remains, as to whether the social breakdown theory may explain the result for the group of high self-efficacious individuals. A moderated mediation approach would allow testing the mediator function of self-esteem, differentiated for high and low self-efficacious individuals. This might reveal, whether only the high self-efficacious group perceives support as a threat to self-esteem, which should then translate into diminished quality of life according to the social breakdown and interference hypothesis.

Another method that might shed light on the link between received support and health outcomes is *multiple-step mediation* (A. B. Taylor, MacKinnon, & Tein, 2008). Chapter 2 revealed that received support was negatively related with self-esteem, which was positively associated with control beliefs. Higher control beliefs in turn were positively related to quality of life. Hence, a temporal sequence in the mediators might have occurred. Thus, in future research it would be wise to use a longitudinal design and a multiple-step mediation approach so that these relationship may be probed further.

##### *Origin of Social Conflict*

Investigating the co-occurrence hypothesis, Chapter 6 found that participants, who experienced high social conflict in combination with high levels of received support, reported less medication adherence. Chapter 6, however, did not investigate, whether the reported conflict actually originated from being supported. An avenue for future research may be to investigate,

whether social conflict is a direct outcome of receiving support. Therefore, more specificity in the measurement of social conflict may be needed to assess the conflicts that result from support situations. Testing, whether received support unfolds its negative effects only, if the recipient's relationship quality with the donor is ambiguous or negative, might further the knowledge on negative social interactions (Holt-Lunstad, et al., 2007; Lakey, 2010).

Future studies might want to investigate *action planning* as a potential mediator between social support and exercise. Action planning is known to be a strategy that enhances the likelihood of exercise engagement and is a self-regulatory strategy that can be carried out together with a companion (Burkert, Knoll, & Scholz, 2005; Hankonen, et al., 2010; van Stralen, et al., 2009).

Future research should further consider that older or less fit study participants might profit more from outside help than younger and healthier individuals (Okun, et al., 2003). Future research would also benefit from investigating further *sources* of support, such as health care providers or group-exercise leaders (van Stralen, et al., 2009). This might help to explain the sometimes occurring negative effects of exercise support (Okun, et al., 2003; Ranby, 2010) and determine which kinds of exercise-specific support are the most effective for exercise behaviour in older individuals with chronic illnesses.

#### *Negative Social Interactions and Negative Emotions*

Previous research has demonstrated that the co-occurrences of negative interactions can also be a major cause for support being perceived as unhelpful by some recipients (Lewis & Rook, 1999; Thompson & Sobolew-Shubin, 1993). Therefore, possible negative interactions, such as overprotection, social undermining or social control, should be assessed in studies that investigate received support.

Future research may add to the findings of this thesis by investigating negative emotions such as feelings of indebtedness, inferiority, guilt, anxiety and depressive symptoms, as an explanation for why social support is perceived as a "mixed blessing" or "double edged sword", as negative emotions are known to increase with unwanted support (Bolger, et al., 2000; Fisher, et al., 1982; Lu & Argyle, 1992; Newsom & Schulz, 1998; Silverstein, et al., 1996). Hence, future research might consider negative social interactions as well as negative emotions to shed light into the effects of receiving support on health and well-being.

To further understand why verbal persuasion did not affect exercise behaviour in older adults, in this thesis (Chapter 5), and even negatively affected exercise in a recent meta-analysis (Ashford, et al., 2010), future research might profit from incorporating measures of exercise intention, overprotection and social control, to determine, whether well-intended attempts of

exercise encouragement might be perceived as oppressing, when recipients do not intend to perform exercise (Ranby, 2010).

#### *Strengths and Limitations*

Several recommendations can be derived from this thesis to improve future studies in terms of: a) sample, b) measurement and c) study design.

#### *Sample*

Both samples that were analysed within this thesis stem from a pool of participants that are representative for the German population between 40 and 80 years (DEAS II and III). However, the samples for this thesis were not drawn at random. This gives reason to believe that the samples were selective: To begin with, all participants were unpaid volunteers. This procedure might have lead to an overrepresentation of participants with high income. In addition, study participants were more likely to be a highly motivated and educated (Walsh, Kiesler, Sproull, & Hesse, 1992). Furthermore, they represented a selection of relatively healthy individuals with multimorbidity, as all of them still lived at home and were fit enough to take part in a 30 minutes interview and to fill in an approximately 60 minutes paper-and-pencil questionnaire. Thus, the thesis' samples are not representative for institutionalised older adult with multimorbidity. In a recent study, Schöllgen et al. (in press) showed that older adults with lower socio-economic status profit more from social support than those with high socio-economic status. Hence, this thesis' results are not generalisable to older adults with multimorbidity that are lower in socio-economic status. To limit the impact of self-selection processes on the results, income, education and health status were statistically controlled, when they might have affected the analyses in this thesis.

To be able to compare and integrate the present findings, future studies should include a healthy control group, to find out which of the observed processes are unique for individuals with more than two chronic conditions, or whether the results are transferable to individuals with one single chronic disease or also hold true for healthy older adults.

Furthermore, the PREFER sample was too small to make illnesses-cluster comparisons. Hence, another challenge for future research will be, to investigate whether different illnesses-combinations exert a qualitatively different impact on individual's quality of life and autonomy and whether different intervention strategies are needed for individuals, who are affected by different illness-clusters (Schüz, Wurm, Warner, & Tesch-Römer, 2009).

### *Measurement*

Even though efforts were made to incorporate objective measures such as the assessment of lung volume (Chapter 5 and 6), most analyses relied on self-reports in this thesis. Participants were considered eligible if they reported to have two or more chronic illnesses via self-report. Although comparative studies found self-reports and symptom lists to be relatively consistent with objective illness data (Chaudhry, Jin, & Meltzer, 2005), it would be desirable for future research to determine multimorbidity according to medical records or diagnoses from general practitioners (Fortin, et al., 2004).

Health behaviours, social resources and risk factors were assessed via self-report measures as well. Although memory biases and social desirability may have influenced reports of exercise frequency and medication adherence in this thesis, comparative studies have shown that self-reports are relatively valid indicators of individual differences in health behaviours (Hansen, et al., 2009; Jacobs, Ainsworth, Hartman, & Leon, 1993; Warnecke, et al., 1997).

Reports of received and provided support are usually biased by selective recall and attribution processes (Wethington & Kessler, 1986), whereas self-reported anticipated support is rather biased by personality characteristics (Finch, et al., 1999; Lakey & Cohen, 2007). However, for the assessment of social resources and risk factors it is inevitable and even desirable to utilise self-reports, as the cognitive processes that bias social interactions are *real* for the reporting person. Objectively similar situations can be perceived differently by different persons. Moreover, for the reporting individuals, their perceptions of social support exist and also exert an actual impact on their perceptions of quality of life and autonomy (Fisher, et al., 1982; Kelley, 1967).

### *Design*

Testing associations on the same measurement occasion does not allow for inferences about the cause and consequence in these associations. For example, the cross-sectional analyses in Chapter 2 were not able to rule out, whether low quality of life mobilises social support (mobilisation hypothesis) or, whether receiving support exerted negative effects on quality of life. Hence, without temporal precedence, alternative explanations for the observed phenomena are always possible. This thesis tried to overcome this issue by testing associations over time in the chapters that followed Chapter 2.

Although the thesis' underlying framework (Figure 2 and 4) assumes the variables to reciprocally determine each other in line with the international classification of functioning, disability and health model (Dixon, Johnston, Rowley, & Pollard, 2008), the majority of chapters in this thesis treated social and personal resources as *independent variables* (solid paths in Figure 4).

To overcome this one-way view, Chapter 5 and 6 tested social support and self-efficacy as *dependent variables* as well and found reciprocal dynamics (dashed paths in Figure 4). Corroborating previous research, Chapter 5 supports the idea of bidirectional effects in finding that self-efficacy beliefs for exercise can be altered by earlier subjective health perceptions (O'Brien Cousins & Tan, 2002; Perkins, Baum, Taylor, & Basen-Engquist, 2009). Furthermore Chapter 6 revealed that individuals, who were less adherent to their medication, got more medication-specific support later on. However, even though this thesis made an effort to investigate reciprocal associations between personal and social resources with classical outcome variables, such as quality of life and health behaviours, the findings remain correlational. And particularly in Chapter 6, one can see, that resources are sometimes as intertwined with their outcomes, that a cause-consequence relation is hard to identify.

Such bidirectional effects between dependent and independent variables in longitudinal social support research may be based on spurious effects (Link & Shrout, 1992). However, even in very strict tests for spuriousness in the received support – harmful outcome relation, the mobilisation hypothesis did not prove to be superior in explaining the naturally occurring negative effects of receiving support (Seidman, et al., 2006). Hence, this thesis adds to the evidence that receiving support is indeed threatening to older adult's autonomy under some circumstances and not just the effect of mobilised support due to health limitations.

Still the assumed cause-consequence relations are mainly based on theoretical foundations and the thesis' attempts to disprove the alternative mobilisation hypothesis are not conclusive. Therefore, future research should consider analysing relations between *changes* in social support and *changes* in the outcomes of interest. This can be implemented by using *latent true change models*, as these models allow investigating intra-individual change associations over time, while reducing the problem of measurement errors (Steyer, Eid, & Schwenkmezger, 1997). Furthermore, an important challenge for future research is to experimentally manipulate social support and its assumed consequences to advance causality assumptions in social support research (Link & Shrout, 1992).

Although the empirical chapters of this thesis have their limitations, relevant implications for research and practice can, nevertheless, be deduced. Therefore, the next section integrates results of this thesis and findings from related literature to derive implications for researchers and practitioners.

*Additional Assessment of Personal Resources*

As pointed out in the introduction and confirmed by the majority of this thesis' chapters, it is quite common that research on social support finds negative effects, especially when *receiving* support is assessed and when older adults are the focus of research. On the one hand, the need for social support grows as age increases and with accumulating health complaints. However, on the other hand, older adults often refuse or disapprove help from others in order to maintain their self-esteem and autonomy (Fisher, et al., 1982; Warner, Schüz, Wurm, Ziegelmann, & Tesch-Römer, 2010; Warner, et al., 2011). Except for exercise behaviour (Chapter 4 & 5), receiving support had detrimental effects on quality of life (Chapter 2), sense of autonomy (Chapter 3) and medication adherence (Chapter 6) for participants in the studies underlying this thesis. As the detrimental effects of receiving help are not explainable by methodological artefacts (e.g., matching of measures) but serious and naturally occurring incidences, future research should continue investigating the exact conditions, under which help is perceived to be unhelpful in older adults with multimorbidity, to figure out, how to avoid such negative interactions.

As Chapter 3 found that social resources may help to compensate lacks in personal resources, but has adverse effects if they are still high, future research should take both personal as well as social resources into consideration. Frequently occurring null or negative findings may thus be explained by testing for interactions between social and personal resources (Casado, et al., 2009). This may reveal subgroups of older adults that are likely to react negatively to outside help and should be given special consideration in interventions.

*Assessment of Perceived Autonomy and General Self-Efficacy in Old Age*

A further contribution of this thesis for future research is the validation of a newly developed scale to assess perceptions of autonomy in older adults (Schwarzer, 2008). The scale had satisfactory discriminant validity and reliability in a pilot project as well as in the PREFER project (see Chapter 3). The instrument is offered through the internet to make it accessible for a wide range of researchers (Schwarzer, 2008). With only four items, the scale is relatively short and hence better to implement into survey studies in comparison to previous scales on autonomy and self-determination (Hertz & Anschutz, 2002; Kersten, et al., 2007; Sheldon, Ryan, & Reis, 1996).

Chapter 3 also validated a 5-item short version of the widely used Generalised Self-Efficacy Scale, of which future survey studies may profit (Schwarzer & Jerusalem, 1995; Warner, et al., 2011).

*Implications for Practice**How to Provide Helpful Support?*

As mentioned in the conceptualisation of social support constructs in the introduction section, functional aspects of social support (e.g., anticipated support, received support) are more proximally related to health and well-being than quantitative aspects (e.g., network size). The age-related tendency to prioritise emotionally meaningful social partners over acquaintances or novel social interaction partners – assumed by the socioemotional selectivity theory – further predicts that interventions that focus on the quantity of social support are less likely to succeed, than those that foster functional aspects (Carstensen, 1992; Lansford, Sherman, & Antonucci, 1998). Consequently, it can be recommended to focus on the functional aspects of social relations in future interventions, instead of attempting to extend older adult's networks.

*Matching Support*

Support that is not matched to the situation and stressor is more likely to result in reactance on the side of the recipient and can even cause direct harm (Fisher et al., 1982). Hence care-givers should carefully take recipients needs and stressors into account to provide support that is as appropriate as possible (Cutrona, 1990; Horowitz, et al., 2001).

*Vicarious Experiences and Friend Support for Exercise*

Chapter 4 and 5 inform exercise interventions for older adults with multiple illnesses. Chapter 4 found favourable effects of exercise-specific support from *friends* and Chapter 5 further pointed out that only *companionship* support (vicarious experience) helps to gain more self-efficacy for exercise. In contrast, family support was less effective and verbal persuasion for exercise did not affect exercise, corroborating previous research (Ashford, et al., 2010; Resnick, et al., 2002; Stevens, et al., 2003). Therefore, it seems to be a good strategy, to enrol older adults in relatively homogenous exercise-groups, or exercise groups with peer-educators to enhance vicarious experiences and companionship support (Beauchamp, Carron, McCutcheon, & Harper, 2007).

*Invisible Support*

A strategy to provide help in a supportive way was developed and investigated by Bolger et al. (2000). They found that the detrimental effects of receiving support may be attenuated, if the recipients do not realise that they are supported, in other words, if the support is *invisible* to the recipient. The recipients are made to believe that they solved a problem on their own by highlighting recipient's positive attributes, instead of drawing attention to the recipient's failed or ineffective

coping attempts. These helping strategies might work even better if the provided support stems from *self-dissimilar donors*, as this prevents processes of social comparison with similar others, who are apparently still able to perform certain actions and solve problems, which the recipient may no longer be able to accomplish (Fisher, et al., 1982).

#### *Autonomy Support*

From the functional perspective of social support, it seems to be a straightforward solution to advise support providers to simply ask, whether potential recipients feel they need help, before deciding on whether to provide help at all, and which kind of help might be appropriate. However, unrealistic optimism or false pride might tempt older people to decline help, even if they may, in fact, need assistance (Schwarzer, 1994). Hence, a more promising approach may be to train family members and primary care-givers to provide support that confirms recipients' autonomy and self-responsibility throughout the helping process.

Professional care interactions, however, often consist of so called *dependency support scripts* – typical interaction patterns between health care providers and recipients, in which recipients' attempts to act autonomously are ignored or even discouraged (Baltes & Wahl, 1992). As a result, such interactions reward dependent behaviour and make it more likely to occur in the future. Autonomy-supportive approaches may help to overcome these problems (Fisher, et al., 1982). A study on residents of nursing home facilities found autonomy support from nurses and social networks members to positively affect resident's ratings of mental and physical health, whereas the quantity of social contacts did not relate to these outcomes (Ryan & Solky, 1996). A study on diabetes patients showed that individuals who felt that they were supported to autonomously manage their disease, had lower glycosylated hemoglobin over the 12-month period of the study (Williams, et al., 1998).

For the reasons mentioned above, it seems recommendable that health care professionals provide patients with choices, information, acknowledgment, and exert low pressure on them to behave in a particular way. Consequently caregivers need to learn how to communicate to recipients that they will be supported in whatever action they chose; however, that the freedom of choice remains within the recipient (Baltes, Neumann, & Zank, 1994; Ryan & Solky, 1996; Von Bergen, Soper, Rosenthal, Cox, & Fullerton, 1999). Such autonomy support has led to greater program involvement, higher adherence to health behaviours and more independent self-care behaviour in community-dwelling as well as institutionalised older adults (Baltes, et al., 1994; Williams, 2002). Therefore, autonomy support seems to be the optimal choice for individuals with

multiple illnesses to prevent learned helplessness and to facilitate living self-administered as long as possible (Seligman, 1974).

To apply this knowledge on invisible and autonomy supportive social support to practice, primary care-givers should be educated in these support styles, by translating the theoretical constructs into meaningful descriptions and examples, followed by role plays (Joekes, Maes, & Warrens, 2007).

#### *How to Accept Social Support?*

Since selective memory, self-evaluative cognitions and the perceived quality of the relationship may bias the appraisal of support over and above the donor's behaviour, the recipient's perception of support has to be considered in order to avoid negative reaction to receiving support as well (Fisher, et al., 1982).

#### *Attribution Style*

Similar helping situations may be perceived very differently by different recipients (Brand, et al., 1995). Attribution theory explains this diversity by assuming that recipients form cognitive evaluations of why they were helped (Kelley, 1967): Some recipients ascribe the reasons for receiving support to their own weaknesses and incompetence to cope with stressors. Consequently, they attribute the cause for being helped on *internal-dispositional* factors (factor within themselves). Learning how to attribute receiving help from others on *external-situational* factors, such as the difficulty of the task, can make it easier for recipients to accept support without experiencing threats to self-esteem or control beliefs (Fisher, et al., 1982).

#### *Balance in Receiving and Providing*

To prevent negative feelings such as shame, dependence, anxiety or depressive mood, recipients may profit from opportunities to "pay back" some of the support they received. Even though older individuals with multiple illnesses may have difficulties to provide types of support, such as physical or financial assistance, they are often capable to listen actively, give advice or support others emotionally (DiMatteo & Hays, 1981). These small favours not only lessen the imbalance between receiving and providing, but offer opportunities to restore control-beliefs and show appreciation for the primary care-providers, which may even improve the relationship quality (Dunbar, Ford, & Hunt, 1998).

#### *Providing Support*

Not only does reciprocating support have beneficial effects on older adult's health and well-being, even helping behaviour that is directed towards others than the primary care-givers has been

shown to enhance quality of life by increasing self-esteem and control-beliefs. Chapter 2 of this thesis supports previous research regarding the positive effects of providing support (Krause, et al., 1992; Krause & Shaw, 2000). An experimental study impressively confirmed the beneficial effect of providing help even for individuals with chronic conditions. More specifically, Schwartz & Sendor (1999) trained a group of study participants with Multiple Sclerosis to provide support to another group with Multiple Sclerosis that received no training. They found that the help providers profited much more from the intervention than the recipients. Therefore, as long as the amount of provided support is moderate and feasible for the provider, and preferably also professionally supervised, even individuals with restricted resources and chronic diseases may profit from helping others. Providing help also has been shown to reduce depressive symptoms and anxiety, while mental quality of life, coping, purpose-in-life and longevity were improved in previous correlational studies (Brown, Nesse, Vinokur, & Smith, 2003; Schwartz, Meisenhelder, Ma, & Reed, 2003).

Future research might benefit from investigating the *behavioural* and *physiological* pathways that may help to explain why providing support to others even increases longevity (Tan, Xue, Li, Carlson, & Fried, 2006). First studies on the behavioural pathways report that older volunteers were more physical active (Tan, et al., 2006) and smoked less as compared to non-volunteers (Oman, et al., 1999). The “*tend and befriend*” mechanism was suggested as an alternative to the “*fight or flight*” reaction towards stressors (Brown, 2007; S. E. Taylor, et al., 2000); however, the endocrinological benefits providers of help experience, have only been explored in few laboratory studies (Batson, Gilbert, Fiske, & Lindzey, 1998; Brown, 2007).

Despite the overall encouraging results for providing help in older adult’s health and well-being, concepts of caregiver burden, carer distress, or costs of caring reported in previous research have to be distinguished from the emotional support that was assessed in this thesis (Savishinsky, 1992). As high-burden donors often experience negative emotions, such as feeling used or frustrated, an over-provision of help may quickly evoke the opposite effect than intended in volunteering or peer-support interventions. This is why such interventions should be closely supervised (Kriegsman, et al., 1995) and researchers, who develop interventions, should keep in mind that the positive effects of providing support are limited to moderate amounts of support (Musick, Herzog, & House, 1999; Riessman, 1990; Savishinsky, 1992).

#### *Communication and Self-Management Skills*

To obtain the type, amount and timing of support an individual needs, social skills play an important role. One important factor for helping interactions to be beneficial is a clear but polite

statement from the potential recipient, on what kind of support is needed (Lakey & Lutz, 1996). To communicate needs very early in a newly established relation or at the occurrence of a recent limitation might facilitate the maintenance of self-esteem and autonomy, as both, the recipient and the provider, then know what kind of help is usually requested and recipients do not have to admit their needs over again. Social skills training may help to establish such a clear communication style and was found to be especially important for older adult with low socio-economic status as they are often equipped with low social skills (Krause & Shaw, 2000).

Some self-management programs have, therefore, developed broader approaches to help chronically ill individuals not only to cope with a specific disease, but also to restore meaningful social roles, personal resources and activities by using social skills training and self-regulatory strategies (Lorig & Holman, 2003; Lorig, Mazonson, & Holman, 1993). Since individuals with multimorbidity are highly motivated to learn self-management strategies to cope with their illnesses than single-morbid persons (Noël, et al., 2007), these comprehensive types of self-management programmes might particularly match the needs of older adults with multiple chronic conditions. Integrative self-management trainings that foster not only social skills, but personal resources as well, are hence required, to educate older adults with multimorbidity that they are able to partake in maintaining their autonomy and quality of life as long as possible.

### *Conclusions*

Returning to the initially posed research questions in the introduction, several conclusions can be drawn from this thesis:

- 1) Is receiving social support a resource or risk factor for health behaviour, quality of life and autonomy in older adults with multiple chronic conditions?  
→ Receiving support was found to be a risk factor in Chapter 2 only, whereas the following chapters either found positive effects of being supported (Chapters 4, 5) or report that receiving support develops adverse effects under certain circumstances only.
- 2) Under which conditions is received support a risk factor – methodological issues, such as the mobilisation or matching hypothesis, or the interplay with self-esteem, self-efficacy and social conflict?  
→ This thesis accumulated evidence that adverse effects of receiving support are not attributable to mobilisation effects, as negative effects emerged longitudinally as well (Chapter 3) and may not be attributed to spuriousness (Seidman, et al., 2006). In addition, they could not be traced back to measurement issues, as adverse effects of receiving support were found for general (Chapter 2 & 6) as well as specific measures of social support (Chapter 6).

Therefore, this thesis tested other more praxis-related explanations. Among these, the social breakdown and failed individual coping theory could not be supported, because the adverse effects of receiving support were not due to decreases in self-esteem and self-efficacy (Chapter 2). Instead, personal resources were found to moderate the link between receiving support and negative outcomes, as individuals with high self-efficacy reported undesirable effects of being supported, whereas individuals with low self-efficacy profited from support in terms of their perceived autonomy (Chapter 3). Furthermore, the level of social conflict made a difference, on whether support was perceived to be helpful or detrimental for participant's medication adherence (Chapter 6).

- 3) Under which conditions is received support a resource? Does the support need to be matched to the outcome or does the investigated outcome per se make a difference? And which type of received support is beneficial for whom?

→ The results of studies on social support seem to be determined to a certain degree by the examined outcome: Exercise-specific social support was perceived to be much more positive than medication-specific support in this sample of older adult with multiple morbidities, as they might have perceived these two behavioural outcomes differently (Chapters 4, 5, 6). Furthermore, support was beneficial for those with limited personal resources only, speaking in favour of a compensatory effect between personal and social resources (Chapter 3). Hence, positive effect of social resource can be expected if they compensate for limitations of personal resources. Special types of support were further found to be more beneficial, such as having a companion rather than to be verbally persuaded to perform exercise (Chapter 5).

This thesis demonstrated that specificity in measurement of social support constructs is indispensable if the goal is to shed light on the disparate effects receiving support may have. Future research and practice should therefore keep the complex multidimensional nature of social interactions and their potential adverse effect under certain circumstances and with certain outcomes in mind and continue conducting investigations by assessing social support constructs very specifically. Together with the knowledge accrued in this thesis, continued investigations of very specific social support constructs may inform and help to develop interventions that facilitate older adult's striving to maintain their quality of life and autonomy for as long as possible despite the various health challenges they encounter.

## References

- Andersen, R. E., Crespo, C. J., Bartlett, S. J., Cheskin, L. J., & Pratt, M. (1998). Relationship of physical activity and television watching with body weight and level of fatness among children: results from the Third National Health and Nutrition Examination Survey. *JAMA*, *279*, 938-942. doi: 10.1177/0898264309348197
- Ashford, S., Edmunds, J., & French, D. P. (2010). What is the best way to change self-efficacy to promote lifestyle and recreational physical activity? A systematic review with meta-analysis. *British Journal of Health Psychology*, *15*, 265-288. doi: 10.1348/135910709X461752
- Aymanns, P. (1992). *Krebserkrankung und Familie [Cancer and Family]*. Bern: Hans Huber.
- Baltes, M. M., Neumann, E.-M., & Zank, S. (1994). Maintenance and rehabilitation of independence in old age: an intervention program for staff. *Psychology and Aging*, *9*, 179-188. doi: 10.1037/0882-7974.9.2.179
- Baltes, M. M., & Silverberg, S. (1994). The dynamics between dependency and autonomy: illustrations across the life span. In D. L. Featherman, R. M. Lerner & M. Perlmutter (Eds.), *Life-span development and behavior* (Vol. 12, pp. 41-90). Hillsdale, NJ: Erlbaum.
- Baltes, M. M., & Wahl, H.-W. (1992). The dependency-support script in institutions: Generalization to community settings. *Psychology and Aging*, *7*, 409-418.
- Bandura, A. (1997). *Self-efficacy: the exercise of control*. New York: Freeman.
- Barrera, M. (1986). Distinctions between social support concepts, measures, and models. *American Journal of Community Psychology*, *14*, 413-445. doi: 10.1007/BF00922627
- Batson, C. D., Gilbert, D. T., Fiske, S. T., & Lindzey, G. (1998). *Altruism and prosocial behavior*. New York, NY US: McGraw-Hill.
- Beauchamp, M. R., Carron, A. V., McCutcheon, S., & Harper, O. (2007). Older adults' preferences for exercising alone versus in groups: considering contextual congruence. *Annals of Behavioral Medicine*, *33*, 200-206. doi: 10.1007/BF02879901
- Bengtson, V. L., & Kuypers, J. A. (1985). The family support cycle: Psycho-social issues in the aging family. In P. M. J. M. A. Munnichs, & E. Olbrich (Ed.), *Life span and change in a gerontological perspective* (pp. 61-77). New York: Academic Press.
- Berkman, L. F., & Glass, T. (2000). From social integration to health: Durkheim in the new millennium. *Social Science & Medicine*, *51*, 843-857 doi: 10.1016/S0277-9536(00)00065-4
- Bisconti, T. L., & Bergeman, C. S. (1999). Perceived social control as a mediator of the relationships among social support, psychological well-being, and perceived health. *Gerontologist*, *39*, 94-103. doi: 10.1093/geront/39.1.94
- Bolger, N., & Amarel, D. (2007). Effects of social support visibility on adjustment to stress: experimental evidence. *Journal of Personality and Social Psychology*, *92*, 458-475. doi: 10.1037/0022-3514.92.3.458
- Bolger, N., Zuckerman, A., & Kessler, R. C. (2000). Invisible support and adjustment to stress. *Journal of Personality and Social Psychology*, *79*, 953-961. doi: 10.1037//0022-3514.79.6.953

- Bracke, P., Christiaens, W., & Verhaeghe, M. (2008). Self-esteem, self-efficacy, and the balance of peer support among persons with chronic mental health problems. *Journal of Applied Social Psychology, 38*, 436-459. doi: 10.1111/j.1559-1816.2008.00312.x
- Brand, E. F., Lakey, B., & Berman, S. (1995). A preventive, psychoeducational approach to increase perceived social support. *American Journal of Community Psychology, 23*, 117-135. doi: 10.1007/BF02506925
- Brown, S. L. (2007). Health effects of caregiving: studies of helping behavior needed. *Alzheimer's Care Today, 8*, 235-246. doi: 10.1097/01.ALCAT.0000281871.81270.eb
- Brown, S. L., Nesse, R. M., Vinokur, A. D., & Smith, D. M. (2003). Providing social support may be more beneficial than receiving it: results from a prospective study of mortality. *Psychological Science, 14*, 320-327. doi: 10.1111/1467-9280.14461
- Brummett, B. H., Mark, D. B., Siegler, I. C., Williams, R. B., Babyak, M. A., Clapp-Channing, N. E., et al. (2005). Perceived social support as a predictor of mortality in coronary patients: effects of smoking, sedentary behavior, and depressive symptoms. *Psychosomatic Medicine, 67*, 40-45. doi: 10.1097/01.psy.0000149257.74854.b7
- Burkert, S., Knoll, N., & Scholz, U. (2005). Korrelate der Rauchgewohnheiten von Studierenden und jungen Akademikern: Das Konzept der dyadischen Planung [Correlates of smoking habits among university students and young academics: The concept of dyadic planning]. *Psychomed, 17*, 240-247.
- Carstensen, L. L. (1992). Social and emotional patterns in adulthood: support for socioemotional selectivity theory. *Psychology and Aging, 7*, 331-338. doi: 10.1037//0882-7974.7.3.331
- Casado, B. L., Resnick, B., Zimmerman, S., Nahm, E.-S., Orwig, D., Macmillan, K., et al. (2009). Social Support for Exercise by Experts in Older Women Post-Hip Fracture. *Journal of Women & Aging, 21*, 48-62. doi: 10.1080/08952840802633719
- Chaudhry, S., Jin, L., & Meltzer, D. (2005). Use of a self-report-generated Charlson Comorbidity Index for predicting mortality. *Medical Care, 43*, 607-615. doi: 10.1097/01.mlr.0000163658.65008.ec
- Chogahara, M., O'Brien Cousins, S., & Wankel, L. M. (1998). Social influence on physical activity in older adults: a review. *Journal of Aging and Physical Activity, 6*, 1-17.
- Clark, D. O. (1996). Age, socioeconomic status, and exercise self-efficacy. *The Gerontologist, 36*, 157-164. doi: 10.1093/geront/36.2.157
- Cutrona, C. E. (1990). Stress and social support: in search of optimal matching. *Journal of Social & Clinical Psychology, 9*, 3-14. doi: 10.1521/jscp.1990.9.1.3
- De Vries, H., Kremers, S., Smeets, T., & Reubsat, A. (2008). Clustering of diet, physical activity and smoking and a general willingness to change. *Psychology & Health, 23*, 265-278. doi: 10.1080/14768320701349107
- Deci, E. L., & Ryan, R. M. (2008). Hedonia, eudaimonia, and well-being: an introduction. *Journal of Happiness Studies, 9*, 1-11. doi: 10.1007/s10902-006-9018-1
- DiMatteo, M. R., & Hays, R. (1981). Social support and serious illness. In B. H. Gottlieb (Ed.), *Social Networks and Social Support* (pp. 117-148). Beverly Hills: Sage.

- Dixon, D., Johnston, M., Rowley, D., & Pollard, B. (2008). Using the ICF and psychological models of behavior to predict mobility limitations. *Rehabilitation Psychology, 53*, 191-200. doi: 10.1037/0090-5550.53.2.191
- Dunbar, M., Ford, G., & Hunt, K. (1998). Why is the receipt of social support associated with increased psychological distress? An examination of three hypotheses. *Psychology & Health, 13*, 527-544. doi: 10.1080/08870449808407308
- Dunkel-Schetter, C., Bennett, T. L., Sarason, B. R., Sarason, I. G., & Pierce, G. R. (1990). Differentiating the cognitive and behavioral aspects of social support. In B. R. Sarason, I. G. Sarason & G. R. Pierce (Eds.), *Social support: An interactional view*. (pp. 267-296). Oxford England: John Wiley & Sons.
- Eckenrode, J., & Wethington, E. (1990). The process and outcome of mobilizing social support. In S. W. Duck & R. C. Silver (Eds.), *Personal relationships and social support* (pp. 83-103). Thousand Oaks, CA: Sage Publications.
- Eyler, A. A., & Brownson, R. C. (1999). Physical activity social support and middle- and older-aged minority women: Results from a US survey. *Social Science & Medicine, 49*, 781-789. doi: 10.1016/S0277-9536(99)00137-9
- Finch, J. F., Okun, M. A., Pool, G. J., & Ruehlman, L. S. (1999). A comparison of the influence of conflictual and supportive social interactions on psychological distress. *Journal of Personality, 67*, 581-622. doi: 10.1111/1467-6494.00066
- Fisher, J. D., Nadler, A., & Whitcher-Alagna, S. (1982). Recipient reactions to aid. *Psychological Bulletin, 91*, 27-54. doi: 10.1037//0033-2909.91.1.27
- Fortin, M., Bravo, G., Hudon, C., Lapointe, L., Almirall, J., Dubois, M.-F., et al. (2006). Relationship between multimorbidity and health-related quality of life of patients in primary care. *Quality of Life Research, 15*, 83-91. doi: 10.1007/s11136-005-8661-z
- Fortin, M., Lapointe, L., Hudon, C., Vanasse, A., Ntetu, A. L., & Maltais, D. (2004). Multimorbidity and quality of life in primary care: a systematic review. *Health and Quality of Life Outcomes, 2*, 51-63. doi: 10.1186/1477-7525-1182-1151
- Fraenkel, L., & Fried, T. (2008). If you want patients with knee osteoarthritis to exercise, tell them about NSAIDs. *The Patient, 1*, 21-26. doi: 10.2165/01312067-200801010-00005
- Gillison, F. B., Skevington, S. M., Sato, A., Standage, M., & Evangelidou, S. (2009). The effects of exercise interventions on quality of life in clinical and healthy populations; a meta-analysis. *Social Science & Medicine, 68*, 1700-1710. doi: 10.1016/j.socscimed.2009.02.028
- Glaser, D. B. (2007). *The paradoxical positive relation between received social support and emotional distress: Is self-esteem the culprit?* DAI-A 68/06, ProQuest Information & Learning, US. Retrieved from <http://gradworks.umi.com/32/69/3269068.html>
- Goetzmann, L., Moser, K. S., Vetsch, E., Klaghofer, R., Naef, R., Russi, E. W., et al. (2006). What do patients think after a lung transplantation about their self, lung and social network? A quantitative analysis of categorical interview data. *Psycho-Social Medicine, 3*, Doc03-Doc03.

- Gordon, P. M., Zizzi, S. J., & Pauline, J. (2004). Use of a community trail among new and habitual exercisers: a preliminary assessment. *Preventing Chronic Disease, 1*, A11-A11.
- Granner, M. L., Sharpe, P. A., Hutto, B., Wilcox, S., & Addy, C. L. (2007). Perceived individual, social, and environmental factors for physical activity and walking. *Journal of Physical Activity & Health, 4*, 278-293.
- Hankonen, N., Absetz, P., Ghisletta, P., Renner, B., & Uutela, A. (2010). Gender differences in social cognitive determinants of exercise adoption. *Psychology & Health, 25*, 55-69. doi: 10.1080/08870440902736972
- Hansen, R. A., Kim, M. M., Song, L., Tu, W., Wu, J., & Murray, M. D. (2009). Comparison of methods to assess medication adherence and classify nonadherence. *The Annals of Pharmacotherapy, 43*, 413-422. doi: 10.1345/aph.1L496
- Hazzard, A., Hutchinson, S. J., & Krawiecki, N. (1990). Factors Related to Adherence to Medication Regimens in Pediatric Seizure Patients. *Journal of Pediatric Psychology, 15*, 543-555. doi: 10.1093/jpepsy/15.4.543
- Hertz, J. E., & Anschutz, C. A. (2002). Relationships among perceived enactment of autonomy, self-care, and holistic health in community-dwelling older adults. *Journal of Holistic Nursing, 20*, 166-186. doi: 10.1177/08910102020002006
- Hinrichs, T., & Trampisch, U. (2010). Körperliche Aktivität bei multimorbiden Patienten [Physical activity in multimorbid patients]. *Public Health Forum, 18*, 29.e21-29.e24 doi: 10.1016/j.phf.2009.12.016
- Holt-Lunstad, J., Uchino, B. N., Smith, T. W., & Hicks, A. (2007). On the importance of relationship quality: the impact of ambivalence in friendships on cardiovascular functioning. *Annals of Behavioral Medicine, 33*, 278-290. doi: 10.1007/BF02879910
- Horowitz, L. M., Krasnoperova, E. N., Tatar, D. G., Hansen, M. B., Person, E. A., Galvin, K. L., et al. (2001). The way to console may depend on the goal: experimental studies of social support. *Journal of Experimental Social Psychology, 37*, 49-61. doi: 10.1006/jesp.2000.1435
- Jacobs, D. R., Ainsworth, B. E., Hartman, T. J., & Leon, A. S. (1993). A simultaneous evaluation of 10 commonly used physical activity questionnaires. *Medicine and Science in Sports and Exercise, 25*, 81-91.
- Joekes, K., Maes, S., & Warrens, M. (2007). Predicting quality of life and self-management from dyadic support and overprotection after myocardial infarction. *British Journal of Health Psychology, 12*, 473-489. doi: 10.1348/135910706X118585
- Kadam, U. T., & Croft, P. R. (2007). Clinical multimorbidity and physical function in older adults: a record and health status linkage study in general practice. *Family Practice, 24*, 412-419. doi: 10.1093/fampra/cmm049
- Kelley, H. H. (1967). Attribution theory in social psychology. In D. Levine (Ed.), *Nebraska Symposium on Motivation* (Vol. 15). Lincoln: University of Nebraska Press.
- Kersten, P., Cardol, M., George, S., Ward, C., Sibley, A., & White, B. (2007). Validity of the impact on participation and autonomy questionnaire - a comparison between two countries. *Disability & Rehabilitation, 29*, 1502-1509. doi: 10.1080/09638280601030066

- Krause, N., Herzog, A. R., & Baker, E. (1992). Providing support to others and well-being in later life. *Journals of Gerontology*, *47*, 300-311. doi: 10.1093/geronj/47.5.P300
- Krause, N., & Rook, K. S. (2003). Negative interaction in late life: issues in the stability and generalizability of conflict across relationships. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *58*, 88-99. doi: 10.1093/geronb/58.2.P88
- Krause, N., & Shaw, B. A. (2000). Giving social support to others, socioeconomic status, and changes in self-esteem in late life. *Journals of Gerontology Series B: Psychological Sciences & Social Sciences*, *55*, 323-333. doi: 10.1093/geronb/55.6.S323
- Kriegsman, D. M. W., Penninx, B. W. H. J., & van Eijk, J. T. M. (1995). A criterion-based literature survey of the relationship between family support and incidence and course of chronic disease in the elderly. *Family Systems Medicine*, *13*, 39-68. doi: 10.1037/h0089392
- Lakey, B. (2010). Social support: Basic research and new strategies for intervention. In J. E. Maddux & J. P. Tangney (Eds.), *Social Psychological Foundations of Clinical Psychology* (pp. 177-194). New York: Guilford.
- Lakey, B., & Cohen, J. L. (2007). Social support assessment. In S. Ayers, A. Baum, C. McManus, S. Newman, K. Wallston, J. Weinman & R. West (Eds.), *Cambridge Handbook of Psychology, Health, & Medicine* (pp. 321-326). Cambridge, England: Cambridge University Press.
- Lakey, B., & Lutz, C. J. (1996). Social support and preventive and therapeutic interventions. In G. R. Pierce, B. R. Sarason & I. G. Sarason (Eds.), *Handbook of social support and the family* (pp. 435-465). New York: Plenum Press.
- Landi, F., Onder, G., Carpenter, I., Cesari, M., Soldato, M., & Bernabei, R. (2007). Physical activity prevented functional decline among frail community-living elderly subjects in an international observational study. *Journal of Clinical Epidemiology*, *60*, 518-524. doi: 10.1016/j.jclinepi.2006.09.010
- Lansford, J. E., Sherman, A. M., & Antonucci, T. C. (1998). Satisfaction with social networks: an examination of socioemotional selectivity theory across cohorts. *Psychology and Aging*, *13*, 544-552. doi: 10.1037/0882-7974.13.4.544
- Lewis, M. A., & Rook, K. S. (1999). Social control in personal relationships: impact on health behaviors and psychological distress. *Health Psychology*, *18*, 63-71. doi: 10.1037/0278-6133.18.1.63
- Link, B. G., & Shrout, P. E. (1992). Spurious associations in longitudinal research. *Research in Community and Mental Health*, *7*, 301-321.
- Lorig, K. R., & Holman, H. R. (2003). Self-management education: history, definition, outcomes, and mechanisms. *Annals of Behavioral Medicine*, *26*, 1. doi: 10.1207/S15324796ABM2601\_01
- Lorig, K. R., Mazonson, P. D., & Holman, H. R. (1993). Evidence suggesting that health education for self-management in patients with chronic arthritis has sustained health benefits while reducing health care costs. *Arthritis & Rheumatism*, *36*, 439-446. doi: 10.1002/art.1780360403

- Lu, L., & Argyle, M. (1992). Receiving and giving support: effects on relationships and well-being. *Counselling Psychology Quarterly*, *5*, 123. doi: 10.1080/09515079208254456
- McAuley, E., Elavsky, S., Motl, R. W., Konopack, J. F., Hu, L., & Marquez, D. X. (2005). Physical activity, self-efficacy, and self-esteem: longitudinal relationships in older adults. *The Journals of Gerontology: Series B: Psychological Sciences and Social Sciences*, *60*, 268-275. doi: 10.1093/geronb/60.5.P268
- McAuley, E., Jerome, G. J., Marquez, D. X., Elavsky, S., & Blissmer, B. (2003). Exercise self-efficacy in older adults: social, affective, and behavioral influences. *Annals of Behavioral Medicine*, *25*, 1-7. doi: 10.1207/S15324796ABM2501\_01
- Moran, P. J., Christensen, A. J., & Lawton, W. J. (1997). Social support and conscientiousness in hemodialysis adherence. *Annals of Behavioral Medicine*, *19*, 333-338. doi: 10.1007/BF02895150
- Musick, M. A., Herzog, A. R., & House, J. S. (1999). Volunteering and mortality among older adults: findings from a national sample. *Journals of Gerontology Series B: Psychological Sciences & Social Sciences*, *54*, 173-180. doi: 10.1093/geronb/54B.3.S173
- Netz, Y., Wu, M.-J., Becker, B. J., & Tenenbaum, G. (2005). Physical activity and psychological well-being in advanced age: a meta-analysis of intervention studies. *Psychology and Aging*, *20*, 272-284. doi: 10.1037/0882-7974.20.2.272
- Newsom, J. T., & Schulz, R. (1998). Caregiving from the recipient's perspective: negative reactions to being helped. *Health Psychology*, *17*, 172-181. doi: 10.1037//0278-6133.17.2.172
- Noël, P. H., Parchman, M. L., Williams, J. W., Jr., Cornell, J. E., Shuko, L., Zeber, J. E., et al. (2007). The challenges of multimorbidity from the patient perspective. *Journal of General Internal Medicine*, *22*, 419-424. doi: 10.1007/s11606-007-0308-z
- O'Brien Cousins, S., & Tan, M. (2002). Sources of efficacy for walking and climbing stairs among older adults. *Physical & Occupational Therapy in Geriatrics*, *20*, 51-68. doi: 10.1300/J148v20n03\_04
- Okun, M. A., Ruehlman, L., Karoly, P., Lutz, R., Fairholme, C., & Schaub, R. (2003). Social support and social norms: do both contribute to predicting leisure-time exercise? *American Journal of Health Behavior*, *27*, 493-507.
- Oman, D., Thoresen, C. E., & McMahon, K. (1999). Volunteerism and mortality among the community-dwelling elderly. *Journal of Health Psychology*, *4*, 301. doi: 10.1177/135910539900400301
- Orsega-Smith, E. M., Payne, L. L., Mowen, A. J., Ho, C.-H., & Godbey, G. C. (2007). The role of social support and self-efficacy in shaping the leisure time physical activity of older adults. *Journal of Leisure Research*, *39*, 705-727.
- Pearlin, L. I., Menaghan, E. G., Morton, A. L., & Mullan, J. T. (1981). The Stress Process. *Journal of Health and Social Behavior*, *22*, 337-356. doi: 10.2307/2136676
- Perkins, H. Y., Baum, G. P., Taylor, C. L. C., & Basen-Engquist, K. M. (2009). Effects of treatment factors, comorbidities and health-related quality of life on self-efficacy for physical activity in cancer survivors. *Psycho-Oncology*, *18*, 405-411. doi: 10.1002/pon.1535

- Preacher, K. J., Rucker, D. D., & Hayes, A. F. (2007). Addressing moderated mediation hypotheses: theory, methods, and prescriptions. *Multivariate Behavioral Research, 42*, 185-227. doi: 10.1080/00273170701341316
- Ranby, K. (2010). *Spousal influences on adult women's exercise: an expansion of the health action process approach model* DAI-B 70/10. Retrieved from <http://gradworks.umi.com/33/80/3380668.html>
- Reich, J. W., & Zautra, A. J. (1995). Spouse encouragement of self-reliance and other-reliance in rheumatoid arthritis couples. *Journal of Behavioral Medicine, 18*, 249. doi: 10.1007/BF01857872
- Resnick, B., Orwig, D., Magaziner, J., & Wynne, C. (2002). The effect of social support on exercise behavior in older adults. *Clinical Nursing Research, 11*, 52-70. doi: 10.1177/1054773802011001005
- Revenson, T. A., Schiaffino, K. M., Majerovitz, S. D., & Gibofsky, A. (1991). Social support as a double-edged sword: the relations of positive and problematic support to depression among rheumatoid arthritis patients. *Social Science & Medicine, 33*, 807-813. doi: 10.1016/0277-9536(91)90385-P
- Revenson, T. A., Wollman, C. A., & Felton, B. J. (1983). Social supports as stress buffers for adult cancer patients. *Psychosomatic Medicine, 45*, 321-331.
- Riessman, F. (1990). Restructuring help: A human services paradigm for the 1990s. *American Journal of Community Psychology, 18*, 221-230. doi: 10.1007/BF00931302
- Roe, B., Whattam, M., Young, H., & Dimond, M. (2001). Elders' perceptions of formal and informal care: aspects of getting and receiving help for their activities of daily living. *Journal of Clinical Nursing, 10*, 398-405. doi: 10.1046/j.1365-2702.2001.00484.x
- Ryan, R. M., & Solky, J. A. (1996). What is supportive about social support? In G. R. Pierce, B. R. Sarason & I. G. Sarason (Eds.), *Handbook of social support and the family*. (pp. 249-267). New York, NY, US: Plenum Press.
- Saltzman, K. M., & Holahan, C. J. (2002). Social support, self-efficacy and depressive symptoms: an integrative model. *Journal of Social & Clinical Psychology, 21*, 309-322. doi: 10.1521/jscp.21.3.309.22531
- Sarason, I. G., Levine, H. M., Basham, R. B., & Sarason, B. R. (1983). Assessing social support: the Social Support Questionnaire. *Journal of Personality and Social Psychology, 44*, 127-139. doi: 10.1037/0022-3514.44.1.127
- Savishinsky, J. S. (1992). Intimacy, domesticity and pet therapy with the elderly: expectation and experience among nursing home volunteers. *Social Science & Medicine, 34*, 1325-1334. doi: 10.1016/0277-9536(92)90141-C
- Schöllgen, I., Huxhold, O., Schüz, B., & Tesch-Römer, C. (in press). Resources for health: Differential effects of optimistic self-beliefs and social support according to socioeconomic status. *Health Psychology*.
- Schröder, K. (1997). *Self-regulation competence in coping with chronic disease*. Münster: Waxmann.

- Schüz, B., Wurm, S., Warner, L. M., & Tesch-Römer, C. (2009). Health and subjective well-being in later adulthood: different health states – different needs? *Applied Psychology: Health and Well-Being, 1*, 23-45. doi: 10.1111/j.1745-7254.2007.00657.x-i1
- Schwartz, C., Meisenhelder, J. B., Ma, Y., & Reed, G. (2003). Altruistic social interest behaviors are associated with better mental health. *Psychosomatic Medicine, 65*, 778-785. doi: 10.1097/01.PSY.0000079378.39062.D4
- Schwartz, C., & Sendor, M. (1999). Helping others helps oneself: response shift effects in peer support. *Social Science & Medicine, 48*, 175-188. doi: 10.1037/10382-012
- Schwarzer, R. (1994). Optimism, vulnerability, and self-beliefs as health-related cognitions: a systematic overview. *Psychology & Health, 9*, 161-180. doi: 10.1080/08870449408407475
- Schwarzer, R. (2008). Perceived Autonomy in Old Age Retrieved January 19, 2010, from <http://userpage.fu-berlin.de/~health/autonomy.htm>
- Schwarzer, R., & Jerusalem, M. (1995). Generalized Self-Efficacy Scale. In J. Weinman, S. Wright & M. Johnston (Eds.), *Measures in health psychology: A user's portfolio. Causal and control beliefs* (pp. 35-37). Windsor, England: NFER-Nelson.
- Schwarzer, R., & Leppin, A. (1991). Social support and health: a theoretical and empirical overview. *Journal of Social and Personal Relationships, 8*, 99-127. doi: 10.1177/0265407591081005
- Seidman, G., Shrout, P. E., & Bolger, N. (2006). Why is enacted social support associated with increased distress? Using simulation to test two possible sources of spuriousness. *Personality and Social Psychology Bulletin, 32*, 52-65. doi: 10.1177/0146167205279582
- Seligman, M. E. P. (1974). Depression and learned helplessness. In R.J. Friedman & M.M. Katz (Eds.), *The Psychology of depression: Contemporary theory and research*. Washington DC: Winston-Wiley.
- Sheldon, K. M., Ryan, R., & Reis, H. T. (1996). What makes for a good day? Competence and autonomy in the day and in the person. *Personality and Social Psychology Bulletin, 22*, 1270-1279. doi: 10.1177/01461672962212007
- Shores, K. A., & West, S. T. (2010). Pursuing leisure during leisure-time physical activity. *Journal of Physical Activity & Health, 7*, 685-694.
- Sibley, A., Kersten, P., Ward, C. D., White, B., Mehta, R., & George, S. (2006). Measuring autonomy in disabled people: validation of a new scale in a UK population. *Clinical Rehabilitation, 20*, 793-803. doi: 10.1177/0269215506070808
- Silverstein, M., Xuan, C., & Heller, K. (1996). Too much of a good thing? Intergenerational social support and the psychological well-being of older parents. *Journal of Marriage & Family, 58*, 970-982. doi: 10.2307/353984
- Stevens, M., Lemmink, K. A. P. M., van Heuvelen, M. J. G., de Jong, J., & Rispens, P. (2003). Groningen Active Living Model (GALM): Stimulating physical activity in sedentary older adults; validation of the behavioral change models. *Preventive Medicine, 37*, 561-570. doi: 10.1016/j.ypmed.2003.09.012

- Steyer, R., Eid, M., & Schwenkmezger, P. (1997). Modeling true intraindividual change: true change as a latent variable. *Methods of Psychological Research, 2*, 21-33.
- Tan, E., Xue, Q.-L., Li, T., Carlson, M., & Fried, L. (2006). Volunteering: A physical activity intervention for older adults - the Experience Corps Program in Baltimore. *Journal of Urban Health, 83*, 954-969. doi: 10.1007/s11524-006-9060-7
- Taylor, A. B., MacKinnon, D. P., & Tein, J.-Y. (2008). Tests of the three-path mediated effect. *Organizational Research Methods, 11*, 241-269. doi: 10.1177/1094428107300344
- Taylor, S. E., Klein, L. C., Lewis, B. P., Gruenewald, T. L., Gurung, R. A. R., & Updegraff, J. A. (2000). Biobehavioral responses to stress in females: tend-and-befriend, not fight-or-flight. *Psychological Review, 107*, 411-429. doi: 10.1037/0033-295X.107.3.411
- Thompson, S. C., & Sobolew-Shubin, A. (1993). Perceptions of overprotection in ill adults. *Journal of Applied Social Psychology, 23*, 85-97. doi: 10.1111/j.1559-1816.1993.tb01053.x
- Thrasher, J. F., Campbell, M. K., & Oates, V. (2004). Behavior-specific social support for healthy behaviors among African American church members: applying Optimal Matching Theory. *Health Education & Behavior, 31*, 193-205. doi: 10.1177/1090198103259184
- Tinetti, M. E., Bogardus, S. T., & Agostini, J. V. (2004). Potential pitfalls of disease-specific guidelines for patients with multiple conditions. *New England Journal of Medicine, 351*, 2870-2874. doi: 10.1056/NEJMs042458
- Uchino, B. N. (2009). Understanding the links between social support and physical health: a life-span perspective with emphasis on the separability of perceived and received support. *Perspectives on Psychological Science, 4*, 236-255. doi: 10.1111/j.1745-6924.2009.01122.x
- Väänänen, A., Vahtera, J., Pentti, J., & Kivimäki, M. (2005). Sources of social support as determinants of psychiatric morbidity after severe life events: prospective cohort study of female employees. *Journal of Psychosomatic Research, 58*, 459-467. doi: 10.1016/j.jpsychores.2004.10.006
- van den Donk, M., Gorter, K. J., & Rutten, G. E. (2010). No negative effects of a multi-factorial, intensified treatment on self-reported health status, treatment satisfaction, and diabetes-related distress in screen-detected type 2 diabetes patients. The ADDITION-Netherlands study. *Quality of Life Research, 19*, 509-513. doi: 10.1007/s11136-010-9604-x
- van Stralen, M. M., De Vries, H., Mudde, A. N., Bolman, C., & Lechner, L. (2009). Determinants of initiation and maintenance of physical activity among older adults: a literature review. *Health Psychology Review, 3*, 147 - 207. doi: 10.1080/17437190903229462
- Veinot, T. C., Flicker, S. E., Skinner, H. A., McClelland, A., Saulnier, P., Read, S. E., et al. (2006). "Supposed to make you better but it doesn't really": HIV-positive youths' perceptions of HIV treatment. *Journal of Adolescent Health, 38*, 261-267.
- Von Bergen, C. W., Soper, B., Rosenthal, G. T., Cox, S. J., & Fullerton, R. (1999). When helping hurts: negative effects of benevolent care. *Journal of the American Psychiatric Nurses Association, 5*, 134-136. doi: 10.1177/107839039900500406

- Wallace, J. P., Raglin, J. S., & Jastremski, C. A. (1995). Twelve month adherence of adults who joined a fitness program with a spouse vs without a spouse. *Journal of Sports Medicine and Physical Fitness*, 35, 206-213.
- Walsh, J. P., Kiesler, S., Sproull, L. S., & Hesse, B. W. (1992). Self-selected and randomly selected respondents in a computer network survey. *Public Opinion Quarterly*, 56, 241-244.
- Warnecke, R. B., Johnson, T. P., Chavez, N., Sudman, S., O'Rourke, D. P., Lacey, L., et al. (1997). Improving question wording in surveys of culturally diverse populations. *Annals of Epidemiology*, 7, 334-342.
- Warner, L. M., Schüz, B., Wurm, S., Ziegelmann, J. P., & Tesch-Römer, C. (2010). Giving and taking – differential effects of providing, receiving and anticipating emotional support on quality of life in adults with multiple illnesses. *Journal of Health Psychology*, 15, 660-670. doi: 10.1177/1359105310368186
- Warner, L. M., Ziegelmann, J. P., Schüz, B., Wurm, S., Tesch-Römer, C., & Schwarzer, R. (2011). Maintaining autonomy despite multimorbidity: self-efficacy and the two faces of social support. *European Journal of Aging*, 8, 3-12. doi: 10.1007/s10433-011-0176-6
- Wethington, E., & Kessler, R. C. (1986). Perceived support, received support, and adjustment to stressful life events. *Journal of Health and Social Behavior*, 27, 78-89. doi: 10.2307/2136504
- Williams, G. C. (2002). Improving patient's health through supporting the autonomy of patients and providers. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of self-determination research* (pp. 233-254). Rochester, NY: University of Rochester Press.
- Williams, G. C., Freedman, Z. R., & Deci, E. L. (1998). Supporting autonomy to motivate patients with diabetes for glucose control. *Diabetes Care*, 21, 1644-1651. doi: 10.2337/diacare.21.10.1644

## **Curriculum Vitae**

**Lisa Marie Warner**

For reasons of data protection,  
the curriculum vitae is not included in the online version.

**List of Publications****ARTICLES IN PEER-REVIEWED JOURNALS** (\* indicates those that are part of the thesis)*In press*

- \* Warner, L. M., Ziegelmann, J. P., Schüz, B., Wurm, S., & Schwarzer, R. (in press). Synergistic effect of social support and self-efficacy on physical exercise in older adults. *Journal of Aging and Physical Activity*.
- \* Warner, L.M., Schüz, B., Knittle, K., Ziegelmann, J. P., Wurm, S. (in press). Sources of perceived self-efficacy as predictors of physical activity in older adults. *Applied Psychology: Health and Well-Being*.
- Schüz, B., Wurm, S., Warner, L. M., & Ziegelmann, J. P. (in press). Self-efficacy and illness representations in individuals with multimorbidity: A multilevel approach. *Psychology & Health*.
- Schüz, B., Wurm, S., Warner, L.M., Ziegelmann, J. P., & Schwarzer, R. (in press). Changes in functional health, changes in medication beliefs and medication adherence. *Health Psychology*.

*2007 - 2011*

- \* Warner, L.M., Ziegelmann, J. P., Schüz, B., Wurm, S., Tesch-Römer, C., & Schwarzer, R. (2011). Maintaining autonomy despite multimorbidity: Self-efficacy and the two faces of social support. *European Journal of Ageing*, 8, 3-12. doi: 10.1007/s10433-011-0176-6
- Schüz, B., Marx, C., Wurm, S., Warner, L. M., Ziegelmann, J. P., Schwarzer, R., & Tesch-Römer, C. (2011). Medication beliefs predict medication adherence in older adults with multiple illnesses. *Journal of Psychosomatic Research*, 70, 179-187. doi: 10.1016/j.jpsychores.2010.07.014
- \* Warner, L. M., Schüz, B., Wurm, S., Ziegelmann, J. P. & Tesch-Römer, C. (2010). Giving and taking – differential effects of providing, receiving and anticipating emotional support on quality of life in adults with Multiple illnesses. *Journal of Health Psychology*, 15, 660–670. doi: 10.1177/1359105310368186
- Turner, S. A., Luszczynska, A., Warner, L. M., & Schwarzer, R. (2010). Emotional and uncontrolled eating styles and chocolate chip cookie consumption: A controlled trial of the effects of positive mood enhancement. *Appetite*, 54, 143-149. doi: doi:10.1016/j.appet.2009.09.020

- Schüz, B., Wurm, S., Warner, L. M., Tesch-Römer, C. (2009). Health and subjective well-being in later adulthood: Different health states – different needs? *Applied Psychology: Health and Well-Being, 1*, 23-45. doi: 10.1111/j.1745-7254.2007.00657.x-i1
- Kessels, U., Warner, L. M., Holle, J., & Hannover, B. (2008). Identitätsbedrohung durch positives schulisches Leistungsfeedback. Die Erledigung von Entwicklungsaufgaben im Konflikt mit schulischem Engagement [Threat to identity through positive feedback about academic performance]. *Zeitschrift für Entwicklungspsychologie und Pädagogische Psychologie, 40*, 22-31. doi: 10.1026/0049-8637.40.1.22
- Warner, L. M., Hohmann, C., Böhmer-Lasthaus, S., Luszczynska, A., Piko, B., Gibbons, F., & Teközel M. (2007). Eine 4-Länder-Studie über sexuelles Schutzverhalten bei Jugendlichen [A four-country study on sexual protection behaviour among adolescents]. *Zeitschrift für Gesundheitspsychologie, 15*, 109-118. doi: 10.1026/0943-8149.15.3.109

*Under Review in Peer Reviewed Journals*

- Warner, L. M., Schwarzer, R., Schüz, B., Wurm, S., & Tesch-Römer, C. (2011). Optimism mediates between objective and perceived physical functioning in older adults. Manuscript submitted for publication.
- \* Warner, L. M., Schüz, B., Aiken, L., Ziegelmann, J. P., Wurm, S., Tesch-Römer, C., & Schwarzer, R. (2011). Interactive Effects of Social Support and Social Conflict in the Prediction of Medication Adherence in Multimorbid Older Adults. Manuscript in preparation.

**BOOK CHAPTERS**

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- Schwarzer, R., & Warner, L. M. (2011). Selbstwirksamkeit bei Lehrern [Teacher self-efficacy]. In: E. Terhart, H. Bennewitz, M. Rothland: Handbuch der Forschung zum Lehrerberuf (pp. 496-510). Münster: Waxmann-Verlag.
- Warner, L. M., & Schwarzer, R. (2009). Selbstwirksamkeit bei Lehrkräften [Teacher self-efficacy]. In O. Zlatkin-Troitschanskaia, K. Beck, D. Sembill, R. Nickolaus & R. Mulder (Eds.), *Lehrprofessionalität. Bedingungen, Genese, Wirkungen und ihre Messung* (pp. 629-640). Weinheim, Germany & Basel, Switzerland: Beltz.
- Warner, L. M., & Lippke, S. (2008). Psychological stage models of physical exercise – Research advances. In M. P. Simmons and L. A. Foster (Ed.), *Sport and exercise psychology - Research advances* (pp. 19-51). Hauppauge, NY: Nova Science Publishers.

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**MISCELLANEOUS**

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Warner, L. M. (2009). "Wer anderen hilft, der hilft auch sich selbst" - Wie helfen Zufriedenheit und Gesundheit fördern kann [How helping behaviour can enhance satisfaction with life and health]. *Informationsdienst Altersfragen*, 36(6), 2-6.

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**SELECTED PRESENTATIONS (first authorships only)**

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Warner, L. M., Ziegelmann, J. P., Schüz, B., Wurm, S., Tesch-Römer, C., & Schwarzer, R. (2010). Autonomie trotz Multimorbidität durch soziale Unterstützung? [Autonomy despite multimorbidity through social support?] Presentation at the 46th Congress of the German Psychological Society, September 27-30, 2010 in Bremen, Germany.

Warner, L. M., Ziegelmann, J. P., Schüz, B., Wurm, S., Tesch-Römer, C., & Schwarzer, R. (2010). The interplay of self-efficacy and social support as predictors of autonomy in older adults with multimorbidity. Presentation at the 24th Annual Conference of the European Health Psychology Society, September 31 - October 4, 2009 in Cluj, Romania.

Warner, L. M., Schüz, B., Wurm, S., Ziegelmann, J. P., & Tesch-Römer, C. (2009). Why helping others helps yourself: Cognitive mediators of the support - quality of life relation. Presentation at the 23rd Annual Conference of the European Health Psychology Society, September 23-26, 2009 in Pisa, Italy.

Warner, L. M., Ziegelmann, J. P., Schüz, B., Wurm, S., & Tesch-Römer, C. (2009). Kann körperliche Aktivität krankheitsbedingte Einbußen von Lebensqualität abmildern? [Can physical activity buffer the effects of illnesses on quality of life?] Presentation at the 9th Congress of the Division of Health Psychology of the German Psychological Society, August 26-28, 2009 in Zürich, Switzerland.

Warner, L. M., Ziegelmann, J. P., Schüz, B., Wurm, S., & Tesch-Römer, C. (2009). Sport als Puffer gegen gesundheitliche Beschwerden im Alter [Exercise as a buffer of health complaints in old age]. Presentation at the 41th Congress of German Sportspsychology, Mai 21-23, 2009 in Leipzig, Germany.

Warner, L. M., Schüz, B., Wurm, S., & Ziegelmann, J. P. (2008). PREFER - Personale Ressourcen für Autonomie und Lebensqualität bei multimorbid erkrankten älteren Menschen [PREFER – Personal resources for autonomy and quality of life in a sample of older adults with multimorbidity]. Presentation at the 9th Congress of the German Society of Geriatrics and Gerontology, December 3-6, 2008 in Potsdam, Germany.

- Warner, L. M., Schüz, B., Wurm, S., Ziegelmann, J. P., & Tesch-Römer, C. (2008). Soziale Unterstützung als Schutzfaktor für die Lebenszufriedenheit von multimorbid erkrankten älteren Personen [Social support as a protective factor the satisfaction with life of older adults with multimorbidity]. Poster presentation at the 9th Congress of the German Society of Geriatrics and Gerontology, December 3-6, 2008 in Potsdam, Germany.
- Warner, L. M., Schüz, B., Wurm, S., Ziegelmann, J. P., & Tesch-Römer, C. (2008). Social support buffers the detrimental effect of multimorbidity on life satisfaction. Poster presentation at the 22nd Annual Conference of the European Health Psychology Society, September 8-12, 2008 in Bath, UK.
- Warner, L. M., Lippke, S., Wiedemann, A. U., Reuter, T., & Ziegelmann, J. P. (2008). Stages and cognitions in physical activity - a theory-guided investigation. Poster presentation at the 29th International Congress of Psychology, July 20-25, 2008 in Berlin, Germany.
- Warner, L. M., Lippke, S., Wiedemann, A. U., Reuter, T., & Ziegelmann, J. P. (2007). Theoriegeleitete Untersuchung des Zusammenspiels sozial-kognitiver Variablen und Stadien der Gesundheitsverhaltensänderung [Theory-based investigation of the interplay between social-cognitive variables in stages of health behaviour change model]. Poster presentation at the 8th Congress of the Division of Health Psychology of the German Psychological Society, September 17-19, 2007 in Schwäbisch Gmünd, Germany. Awarded with the Poster Award of the Health Psychology Division of the German Psychological Society.
- Warner, L. M., Lippke, S., Reuter, T., Wiedemann, A. U., & Ziegelmann, J. P. (2007). Sozial-kognitive Determinanten verschiedener Arten von körperlicher Aktivität – eine theoriegeleitete Analyse [Social-cognitive determinants of different types of physical activity – a theory based analysis]. Poster presentation at the 39th Congress of German Sportpsychology, Mai 17-19, 2007 in Munich, Germany.
- Warner, L. M., Hohmann, C., Turner, S., & Luszczynska, A. (2006). Geschlecht als Moderator bei der Wirkung positiver Stimmungsinduktion auf das Essverhalten [Sex as a moderator fort he relation between positive mood induction and eating behaviour]. Poster presentation at the 45th Congress of the German Psychological Society, September 17-21, 2006 in Nürnberg, Germany.

**Erklärung**

Hiermit versichere ich, dass ich die vorgelegte Arbeit selbständig verfasst habe. Andere als die angegebenen Hilfsmittel habe ich nicht verwendet. Die Arbeit ist in keinem früheren Promotionsverfahren angenommen oder abgelehnt worden.

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Unterschrift (Lisa Marie Warner)

Berlin, März 2011