Loneliness Interventions from an Aging Perspective

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Social species do not fare well when forced to live solitary lives. Social isolation decreases lifespan of the fruit fly, *Drosophila melanogaster* (Ruan & Wu, 2008); promotes the development of obesity and Type 2 diabetes in mice (Nonogaki, Nozue, & Oka, 2007); delays the positive effects of running on adult neurogenesis in rats (Stranahan, Khalil, & Gould, 2006); increases the activation of the sympathto-adrenomedullary response to an acute immobilization or cold stressor in rats (Dronjak, Gavrilovic, Filipovic, & Radojcic, 2004); decreases the expression of genes regulating glucocorticoid response in the frontal cortex of piglets (Poletto, Steibel, Siegford, & Zanella, 2006); decreases open field activity, increased basal cortisol concentrations, and decreased lymphocyte proliferation to mitogens in pigs (Kanitz, Tuchscherer, Puppe, Tuchscherer, & Stabenow, 2004); increases the 24 hr urinary catecholamines levels and evidence of oxidative stress in the aortic arch of the Watanabe Heritable Hyperlipidemic rabbit (Nation et al., 2008); increases the morning rises in cortisol in squirrel monkeys (Lyons, Ha, & Levine, 1995); and profoundly disrupts psychosexual development in rhesus monkeys (Harlow et al., 1965).

Humans are an irrepressibly meaning-making species, and a large literature has developed showing that perceived social isolation (i.e., loneliness) in normal samples is a more important predictor of a variety of adverse health outcomes than is objective social isolation (e.g., Cole et al., 2007; Hawkley, Masi, Berry, & Cacioppo, 2006; Penninx et al., 1997; Seeman, 2000; Sugisawa, Liang, & Liu, 1994). In an illustrative study, Luo, Hawkley, Waite, and Cacioppo (2012) examined the relationship between loneliness, health, and mortality using a U.S. nationally representative sample of 2,101 adults aged 50 years
and over from the 2002 to 2008 waves of the Health and Retirement Study. We estimated the effect of loneliness at one point on mortality over the subsequent six years, and investigated social relationships, health behaviors, and health outcomes as potential mechanisms through which loneliness affects mortality risk among older Americans. We operationalized health outcomes as depressive symptoms, self-rated health, and functional limitations, and we conceptualized the relationships between loneliness and each health outcome as reciprocal and dynamic. We found that feelings of loneliness were associated with increased mortality risk over a 6-year period, and that this effect was not explained by social relationships or health behaviors.

Loneliness has also been associated with the progression of Alzheimer’s Disease (Wilson et al., 2007), obesity (Lauder, Mummery, Jones, & Caperchione, 2006), increased vascular resistance (Cacioppo, Hawkley, Crawford et al., 2002), elevated blood pressure (Cacioppo, Hawkley, Crawford et al., 2002; Hawkley et al., 2006), increased hypothalamic pituitary adrenocortical activity (Adam, Hawkley, Kudielka, & Cacioppo, 2006; Steptoe, Owen, Kunz-Ebrecht, & Brydon, 2004), less salubrious sleep (Cacioppo, Hawkley, Berntson et al., 2002; Hawkley, Preacher, & Cacioppo, 2010; Pressman et al., 2005), diminished immunity (Kiecolt-Glaser et al., 1984; Pressman et al., 2005), reduction in independent living (Russell, Cutrona, De La Mora, & Wallace, 1997; Tilvis, Pitkala, Jolkkonen, & Strandberg, 2000), alcoholism (Akerlind & Hornquist, 1992), depressive symptomatology (Cacioppo et al., 2006, 2010; Heikkinen & Kauppinen, 2004), suicidal ideation and behavior (Rudatsikira, Muula, Siziya, & Twa-Twa, 2007), and mortality in older adults (Penninx et al., 1997; Seeman, 2000). Loneliness has even been associated with gene expression -- specifically, the under-expression of genes bearing anti-inflammatory glucocorticoid response elements (GREs) and over-expression of genes bearing response elements for pro-
inflammatory NF-κB/Rel transcription factors (Cole et al., 2007, 2011). These population-based data contribute to a growing literature indicating that loneliness is a risk factor for morbidity and mortality and point to potential mechanisms through which this process works.

Much of our research has drawn on data from the Chicago Health, Aging, and Social Relations Study (CHASRS), a population based longitudinal study of non-Hispanic White, African American, and non-Black Latino American persons born between 1935 and 1952, and living in Cook County, IL that we created to investigate the antecedents and consequences of loneliness in older adults. The final sample consisted of 229 individuals who ranged from 50-68 years of age on the first testing occasion.

Social and demographic changes are placing an increasing number of adults at risk for loneliness. For instance, Census data indicate the U.S. population is both aging and increasingly living alone. Social networking and other technological connections have been posited to change the very nature of human connectivity and interpersonal relationships, but the extant evidence does not address whether these developments increase or decrease the risk for loneliness generally, or for older adults (who have lived most of their lives with little if any access to personal computing devices) in particular. Indeed, the extant data suggest that online relationships are not a substitute for face to face relationships.

The importance of identifying or developing effective interventions for persistent loneliness derives from the mental and physical health consequences that have been documented – health consequences that exceed those ascribed to obesity. Moreover, recent epidemiological analyses have shown that loneliness predicts mortality independently of demographic variables, health behaviors, and objective social circumstances, and our review of the human and animal literature has revealed considerable overlap in the effects of social
isolation on neural, neuroendocrine, immunological, and gene transcriptional processes
(Norman et al., under review). These findings indicate that inadequacy of the social control
hypothesis – the notion that isolation is unhealthy because one’s health behaviors deteriorate
in the absence of friends and family – for the health consequences of loneliness.

The growing recognition of the costs of loneliness has led to a number of
intervention studies. Qualitative reviews have identified four primary intervention strategies:
1) improving social skills, 2) enhancing social support, 3) increasing opportunities for social
contact, and 4) addressing maladaptive social cognition. We performed an integrative meta-
analysis of loneliness reduction interventions to quantify the effects of each strategy and to
examine the potential role of moderator variables. Results revealed that single group pre-
post and non-randomized comparison studies yielded larger mean effect sizes relative to
randomized comparison studies. Among studies that used the latter design, the most
successful interventions addressed maladaptive social cognition. This is consistent with
current theories regarding loneliness and its etiology. Theoretical and methodological issues
associated with designing new loneliness reduction interventions are discussed.
Laura Carstensen

Guiding Questions for Your Think Piece:

1) Please provide a brief description of the areas of your research that intersect with the agenda for the meeting.

The theoretical and empirical foci of my research program concern motivational changes that occur across adulthood and the ways in which such changes influence cognitive processing and emotional experience. Socioemotional selectivity theory (SST) is a life-span theory of motivation (Carstensen, 1993; Carstensen, Isaacowitz & Charles, 1999; Carstensen, 2006). According to SST, a core constellation of goals operates throughout adulthood, including basic goals associated with attachment and control as well as goals associated with instrumental needs and emotional gratification. The key postulate of SST is that the relative importance of goals within this constellation changes as a function of future time horizons. Because chronological age is inversely associated with actual and perceived time left in life, systematic age differences emerge in preferred goals.

Importantly, according to SST, age differences in goal hierarchies reflect perceived future time more than time since birth (viz., chronological age). When the future is perceived as long and nebulous, as it typically is in youth, future-oriented goals related to gathering information and expanding horizons are prioritized over emotional gratification. When time horizons are constrained present-oriented goals related to emotional satisfaction and meaning are prioritized over goals associated with long-term rewards.

In addition to emphasizing changes in goals with age, the theory predicts that when younger people perceive time constraints or older people perceive the future as relatively long, age differences are reduced or eliminated. A number of empirical investigations have supported this claim (e.g., Fredrickson & Carstensen, 1990; Fung & Carstensen, 2004; Fung, Carstensen, & Lutz, 1999). When life’s fragility is made salient by events like September 11th or the SARS epidemic in Hong Kong, for example, age differences in socioemotional goals disappear (Fung & Carstensen, 2006). Similarly, under experimental conditions that extend time horizons, older peoples’ goals closely resemble younger peoples’ goals (Fung et al., 1999). Thus, the influence of time horizons on goals has been well-established.

The theoretical perspective of SST argues that age-related changes in goals are adaptive, reflecting the reality that changing time horizons and ultimately mortality impose. When futures are long and nebulous, acquiring knowledge and exploration help prepare individuals for an array of uncertain challenges looming ahead. As time horizons grow shorter, future-oriented goals related to preparation for the long-term grow less important and present-oriented goals related to emotional meaning, emotion regulation and well-being gain in priority. Accordingly, many observed age-related changes in emotion, cognition, and behavior are presumed to be top-down and fluid (varying as a function of motivation) rather than bottom up and fixed (varying as a function of biological aging or experience).

One important finding from our group and others is that older people fare relatively well emotionally. They experience fewer negative emotions in day to day life (Carstensen, et al., 2000; 2011). In Gallop poll surveys, they report less stress and anger in “yesterday” interviews (Stone et al, 2010). They experience relatively low levels of mental health disorders (Blazer, in press). Some of these changes are likely rooted in experience. We maintain that the changes in goals described above also play a key role: When chronically activated goals focus on emotional well-being, it’s good for mental health.
Early in the last decade, our research team began to test hypotheses about the ways that motivational changes postulated by SST may influence cognitive processing. These efforts expanded upon a large and rich literature in psychology documenting the powerful influence that goals exert on cognitive processing. From classic studies by Neisser and colleagues on inattentional blindness (e.g., Neisser, 1979) to more recent studies on the subconscious priming of explicit goals (e.g., Chartrand & Bargh, 1996; Moskowitz, 2002), the literature has revealed powerful top-down effects of goals on information processing. We reasoned that because chronically activated goals appear to change systematically with age, such changes may consequently direct attention and memory toward or away from emotional material in systematic ways.

When our research team began to examine questions about potential effects of motivation on cognitive processing, findings quickly suggested that whereas younger people appear to privilege negative information in cognitive processing (Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001; Rozin & Royzman, 2001), older people commonly privilege positive information. Indeed, several early studies found a classic crossover interaction between age and valence (e.g., Mather et al., 2004; Mikels, Larkin, Reuter-Lorenz, & Carstensen, 2005) though it is clear that regulating emotions can be influenced by increased processing of positive or decreased processing of negative information.

2) Are there particular lifespan-relevant motivational challenges that need to be overcome or specifically targeted? What do we know about aging and life course development that raises special concerns and/or opportunities for motivation-related interventions?

I collapsed questions 2 and 3. As marketers know, the best way to effectively sell an idea or a product is to convince the target market that it will help them achieve their goals. Appreciating that generally-speaking older people are doing fine emotionally and care deeply about meaningful experiences points to certain kinds of messaging and should steers interested parties away from other messages. Helene Fung and I conducted a series of studies where we compared memory for advertising messages that either promised emotional rewards or rewards associated with expanding horizons (Fung & Carstensen, 2009). The majority of older participants preferred the advertisements featuring the emotion-related slogans. They also remembered these slogans and the products associated with them better than they did the slogans about exploration and knowledge. Importantly, however, when older participants were asked to imagine an expanded future before they indicated their preference, they made choices similar to those made by younger participants, i.e., they failed to show a significant preference for the emotion-related slogans.

Nanna Notthoff and I have been studying the effectiveness of positive and negative messaging to encourage exercise. The findings strongly suggest that positive messages are more effective in older age groups. One vulnerability that older people may face has to do with the positivity effect. If older people focus on positive information, they may fail to process relevant negative information. Our group has begun some work on financial fraud to see if older people are especially vulnerable. Research shows that older people are targeted more than younger people. Whether they are more vulnerable remains an unanswered question.
3) What basic research questions need to be investigated before moving to interventions? How can research on basic mechanisms be combined with field-based approaches to behavior change?

To date, field-based interventions that have ignored mechanisms have not been terribly effective. In the 1980s numerous attempts to increase social interaction failed. In my opinion, they failed largely because they ignored older peoples’ goals and abilities. Many presumed, for example, that older people were lonely and suggested that participation would be “good for them” as opposed to understanding that older people are by and large doing well emotionally but are intrigued by opportunities to engage in meaningful activities.

We need to know works. Does the positivity effect operate even in high stakes contexts? How can infrastructures encourage participation and healthy lifestyles? What messaging is most effective?

The MacArthur Network on Aging Societies will administer a survey this week that asks employees about their interest in volunteerism. Using a quasi-experimental design, subsets of participants will receive different pitches that stratify emotional meaningfulness, flexibility, alone/with others and experience-based/no experience needed messages. Using these responses we will follow actual recruitment efforts.

References


Geoffrey Cohen

My research addresses the social psychological processes involved in how people cope with threats to self in various arenas, such as school, medical care settings, and conflict. We have developed interventions that help people to cope better with threatening situations at key life stages. For example, one intervention encourages students to write about important personal values during stressful transitions, such as the transition to middle school or college. It improved the school achievement of academically at-risk minority students.

On the whole, the interventions we’ve tested help people to fulfill core motives for self-affirmation, social belonging, and personal competence that may be challenged in stressful transitions or in chronically threatening environments like school or work. The effectiveness of these interventions rests in (A) their ability to target core psychological motives or levers; (B) their timing to coincide with stressful developmental periods; and (C) their ability to exploit feedback loops such that a timely intervention can, like a chain reaction, trigger cumulative and catalytic consequences for the better.

One way in which our research dovetails with the topic of aging centers on the idea that development through the lifespan introduces different kinds of threats to the integrity of the self and the narratives of self-adequacy that people create. These include threats to health, to relationships, to a sense of purpose. It would be worthwhile to assess whether and how conceptually related interventions improve functioning, health, and vigor across the lifespan.
**Carol Dweck**

**Guiding Questions for Your Think Piece:**

1) Please provide a brief description of the areas of your research that intersect with the agenda for the meeting.

My research has shown that students’ mindsets about their ability can have an appreciable impact on their motivation and achievement. Those who believe that their talents or intelligence are fixed traits (a fixed mindset) show lower motivation to learn and poorer achievement than those who believe that these qualities can be developed (a growth mindset). Interventions in my lab and other labs, have taught students a growth mindset and how to apply it to their schoolwork. Students learn that every time they stretch beyond their comfort zone to learn new things, the neurons in their brains form new connections and, over time, they can become smarter. These interventions have increased students’ motivation to learn, persistence in difficult courses, grades, and achievement test scores (e.g., Aronson, Fried, & Good, 2002; Blackwell, Trzesniewski, & Dweck, 2007; Good, Aronson, & Inzlicht, 2003).

2) What would you characterize as the reasons your approach has worked? How does it work?

Changing mindsets changes a student’s whole motivational framework (Blackwell et al., 2007). In a fixed mindset, the goal is to always look smart and never look dumb, and difficulty (or even effort) is interpreted as signaling low ability. Hence, difficulty is a sign to flee or give up. In a growth mindset, the goal is to learn—to get smarter—and hard tasks provide the means to do so. Thus, a growth mindset fosters challenge-seeking and resilience.

Imagine a student who is working on a highly challenging task. If the student is in a fixed mindset, concerns about low ability will be ever-present. However, for a student in a growth mindset, images of neurons making precious new connections will instead abound, making the task feel more motivating and the results more fruitful.

3) How would you envision harnessing what you have learned from your work to advance the goals of this meeting?

4) What do you see as the potential of this research to inform interventions aimed at mid-life and older adults — i.e., is there potential for expansion, application to an older age group, use in a different context, etc.?

The mindset interventions could readily be adapted for working with mid-life and older adults. First, with regard to issues of memory loss or cognitive decline, a growth mindset intervention could be developed to teach older adults how these skills can be maintained through their efforts. Such an intervention could also serve as an introduction to cognitive training programs. Second, many mid-life adults are facing career challenges or even job loss. A growth mindset intervention could be a key component in programs that seek to train new job skills or that attempt to encourage adults to seek new job skills.
In exciting new research, Plaks and Chasteen (2012) studied older adults (60-81) and showed that mindsets can play a role in their memory performance. In one study, they examined pre-existing mindsets about memory decline and in a second study, they randomly assigned participants to (temporarily) learn a growth mindset or a fixed mindset about memory decline (it is inevitable vs. it is preventable). In both studies, those with a growth mindset outperformed those with a fixed mindset on memory tasks.

5) What research gaps would need to be filled to advance such goals?

Mindset interventions have typically been conducted with adolescents or college students. However, it would be exciting to design and test an intervention (or interventions) for use with older adults in areas relating to skill acquisition or skill retention. We also have a line of research on mindsets and willpower, and it would be interesting to examine its applicability to intervention to increase self-regulation (healthy eating, exercise) in older adults.
1. I am an expectancy-value theorist interested in the psychological and social influences on behavioral choices. I am particularly interested in the role that Subjective Task Value and confidence in one’s ability to succeed play in behavioral choices across the life span. Although most of my empirical work has focused on the first 3 decades of life and on behavioral choices linked to education, work, and leisure time use, I believe the theoretical models I have worked on apply to the full life span. For example, I have been particularly interested in role of social and personal identities and of short and long term goals in guiding current behavioral choices. I assume these identities and goals give meaning to particular behaviors to individuals in light of their own goals and personal circumstances.

My research suggests that individuals are more likely to engage in behaviors to the extent that they believe the behaviors mesh well with their own identities and goals. People of all ages have such identities and goals; their engagement in various activities in their aging years should be impacted by these identities and goals. Interventions need to take individuals’ personal and social identities into account if we hope to elicit voluntary engagement in the behavioral targets of the interventions.

We know very little about changes in goals and identities as people age but life course developmental theory and empirical data suggest that there are normative patterns of change as Americans and Germans retire, become grandparents or great grandparents, lose partners and friends to death, and experience declines in their physical and mental resources. We need basic research on both normative patterns and individual differences in patterns of change in social and individual identities, as well as in the patterns of changes in the social supports available in different people’s life spaces as they age.

I am also quite interested in the role of what I call COST in determining the Subjective Task Value of various alternative behaviors or activities. If the physical, psychological or financial cost of a particular behavior becomes too high (meaning higher than other equally valued activities or soon to become equally valued activities), individuals should be less likely to choose such activities or tasks. As people age, the cost of engaging in many tasks are likely to go up due to increasing constraints on the individuals’ physical health and financial resources. This point of view is consistent with Baltes and Baltes’s idea of SOC – selection, optimization, and compensation. As personal resources (biological, psychological, social, or financial) decline, the cost of engaging in some behaviors previously enjoyed may increase while the cost of other activities may decline. This is likely to be particularly true if there are not adequate social or external resources available to compensate for the declines in personal resources. Such changes in physical and financial well-being should lead to shifts in the Subjective Task Value of various activities. These shifts need to taken into consideration in designing interventions. Some interventions should focus on providing the best social supports needed to allow efficient and health promoting SOC.

2. I addressed this question to some extent under #1. I believe we know very little about the motivational challenges within an expectancy-value or SOC perspective. Many of
challenges come from changing major life roles as one ages, as well as from dramatic changes in one’s social, financial, and physical resources. In the USA, the great mobility of the population adds further challenges as one ages and either moves oneself or experiences moves in one’s closest social support network members. Finally, the increasing salience of one’s own mortality as one ages is very likely to create motivational challenges related to one’s own well-being and to one’s role in the next generations’ lives and well-being. Erikson and Carstensen have both written quite thoughtfully about these motivational aspects of aging.

3. I am a novice to the aging period of life but am becoming increasingly interested in it as I age. Thus I am looking forward to hearing more from the aging experts about what we know about this question.

4. I noted some questions that I think are key in under #! and #2. I think we need to know more about the link of physical and financial changes to changes in individuals’ personal and social identities, self-perceptions, goals, perceptions of various tasks and the costs associated with engaging in those tasks. We need to know more about the meanings individuals attach to such changes for their own short and long term goals, as well as their perceptions of the social supports they need and believe they can access. The work done by Jackson and his colleagues on the Black American families provides an excellent example of the types of work that is needed along these lines.

We also need more basic research on the relationship of both specific skill based and social support interventions for supporting mental, cognitive, and physical well-being. Then we need to determine if the impact of these interventions are mediated by motivational processes.

We need to know more about the role of biological changes on motivational changes and the ways in which biologically based interventions can influence motivational changes.

5. in a stepwise fashion. I believe this can easily be done with adequate funding. We have the techniques and models. What is needed is the funding.
Motivation and Aging: Toward the Next Generation of Behavioral Interventions
NRC Meeting June 18-19, 2012
Think Piece
Margie E. Lachman

Please provide a brief description of the areas of your research that intersect with the agenda for the meeting.

Beliefs and expectancies about aging make a difference for health and well-being. Our work is guided by a conceptual model in which beliefs about control over outcomes have motivational implications (Lachman, 2006). Those who believe they have some degree of control over aging-related outcomes (minimizing losses, maintaining abilities) are more likely to take action, use effective strategies, exert more effort in health-promoting behaviors, and persist in the face of challenges. Those with a greater sense of control are also more responsive to interventions (Lachman, Neupert, & Agrigoroaei, 2011; Payne et al., 2012). In contrast, those who believe that aging-related declines are largely inevitable and irreversible are more anxious and stressed and less task-focused when engaging in difficult tasks.

In longitudinal and experimental studies we have examined beliefs about control over aging-related changes in multiple domains including memory, health, and physical activity. On average, perceived control dwindles with age, yet there are wide individual differences. Of interest is why some maintain a sense of control and remain engaged well into old age. Control beliefs are a moderator of age and socioeconomic status differences in health and cognitive performance in that stronger control beliefs buffer aging-related declines and attenuate education-related inequalities (e.g., Lachman & Weaver, 1998). In recent work we demonstrated that a sense of control in combination with social support and physical activity were protective against declines in functional health and cognitive reasoning over a 10- year period (Agrigoroaei & Lachman, 2011; Lachman & Agrigoroaei, 2010). Many psychosocial and behavioral factors are modifiable and are potential targets for intervention.

We conducted three intervention studies to improve memory, functional health, and increase physical activity (Jette et al., 1999; Lachman, Weaver, Bandura, Elliott, & Lewkowicz, 1992; Neupert, Lachman, & Whitbourne, 2009; Tennstedt et al., 1998). Our conceptual framework emphasized the role of beliefs about controllability as a foundation for successful outcomes. In all cases the training involved a focus on learning new skills and strategies for behavior change as well as on social support and cognitive restructuring to increase the sense of control.
Are there particular lifespan-relevant motivational challenges that need to be overcome or specifically targeted?

Many adults hold the view that aging-related changes (for e.g., in memory, strength, balance) are inevitable and irreversible. This world view affects motivation to participate in interventions as well as adherence to treatments and recommended regimens. Thus, it is important to address these misconceptions in the context of intervention programs and behavior change.

For middle-aged adults, one of the key challenges in daily life is juggling multiple demands. Their focus is typically on those younger and older at home, in the workplace, and in society at large, often paying less attention to their own health and well-being. Those in midlife report one of their most common problems is not having enough time to get everything done. Stress and depression are at their peak in this age period, and adoption of new behavior regimens is difficult given the time constraints. Ideally, interventions could be integrated into daily life especially in the context of work and family with potential benefits at a group as well as an individual level.

What do we know about aging and life course development that raises special concerns and/or opportunities for motivation-related interventions?

Studies have shown that a focus on the potential gains and positive benefits of change is typically more adaptive and effective than highlighting the negative consequences or losses associated with not taking action, especially for older adults (e.g., Shamaskin, Mikels, & Reed, 2010). In addition, for older adults, a focus on the value of accumulated experience and other positive images of aging may reduce concerns about failure and promote adaptive responses (e.g., Hess, Hinson, & Statham, 2004; Levy, Slade, Kunkel, & Kasl, 2002).

What basic research questions need to be investigated before moving to interventions?

Aging-related changes affect beliefs and these beliefs also affect subsequent behavior and outcomes. More work is needed to investigate directionality and causality. Recent longitudinal work provides promising evidence that changes in health are influenced by control beliefs (Gerstorf, Röcke, & Lachman, 2011; Infurna, Gerstorf, Ram, & Schupp, 2011; Infurna, Gerstorf, & Zarit, 2011). Understanding the mechanisms that link beliefs and outcomes may suggest specific targets for interventions. If we focus on modifying the environment, will this enhance or diminish the individual’s sense of control, and what are the consequences?

Although there is some evidence that control beliefs can be modified, more work is needed to refine the approaches and determine whether effects are general or domain-specific. More research is needed to examine the impact of changing beliefs for outcomes in both the short and long term as well as the generalizability and transfer of effects to everyday life.
How can research on basic mechanisms be combined with field-based approaches to behavior change?

There are many approaches and goals for interventions. The focus can be on: remediation, compensation, protection, prevention, enhancement, and/or optimization. More information is needed to decide the best timing and targets of interventions, including which behaviors, when, and for whom. As for timing, there are questions as to whether sooner is better or whether it is ever too late to intervene. There is increasing evidence that aging is a gradual process and that subclinical changes occur in the body and brain long before they have functional implications. This suggests the need for intervention earlier especially if the goal is prevention. Intervention research can also help to illuminate the promise and limits of plasticity.

As for targets, some interventions could be aimed at those who are most vulnerable and at greatest risk for poor aging outcomes, and others for optimization among those who are already doing well. To some extent those who participate in interventions may already be motivated and functioning well. How do we recruit those who need the interventions most? Interventions ideally will be multifaceted and integrated into daily life, perhaps in the context of health care settings, the work place, or family life.

One approach is to tailor interventions to individuals much as the pharmaceutical industry is doing. Person by treatment targeted approaches may turn out to be most effective. For instance, it may not be easy to change aspects of personality, so different intervention approaches may be needed for those who are high and low on conscientiousness, for example.

In designing interventions, we should give a good deal of attention to what is the right type of control group. Typically designs include active control groups with the same amount of contact as the treatment group, but with different content. Other approaches may be appropriate.

Interventions using experimental designs including randomized clinical trials can be effective not only for behavior change but also to examine processes. Some interventions take a “kitchen sink” approach with a multifaceted treatment. In this case, if the treatment works it is not clear which aspects were effective. Ideally, studies can vary specific treatments with different combinations to test which components are most effective. This type of experimental intervention design is ideal for identifying mechanisms. Rather than lab-based programs which typically have a short shelf life, interventions can be done in the context of daily life to facilitate long-term changes.
Following from the seminal work of Ferster (1973) and Lewinsohn (1974) focused on the role of reinforcement in depression, Jacobson et al. (1996) found that the behavioral components of cognitive behavior therapy (CBT) for depression (Beck, Rush, Shaw, & Emery, 1979) performed as well as the full CBT package. Jacobson et al. (1996) referred to the behavioral component of CBT as Behavioral Activation (BA). From Jacobson et al (1996), Martell, Addis, and Jacobson (2001), and then Martell, Dimidjian, & Hermann-Dunn (2010) provided a more comprehensive 20-session BA treatment manual that was expanded to include a primary focus on targeting behavioral avoidance as well as a variety of other related strategies more indirectly related to behavioral activation (e.g., periodic distraction from problems/unpleasant events, mindfulness training, and self-reinforcement). Several key large scale randomized clinical trials have indicated that BA is a cost-effective and efficacious alternative to cognitive therapy and antidepressant medication (Dobson et al., 2008; Dimidjian et al., 2006).

My work, in collaboration with Derek Hopko at the University of Tennessee has been in developing a compact 5-10 session BA. This protocol is limited to the components tied most directly to the underlying behavioral theory (Brief BA; referred to in some papers as BATD) and focused on the importance of value-guided positive actions to improve one’s interaction with their environment. Several trials provide support specific to Brief BA with more straightforward cases of depression, but Derek and I have moved away from a narrow
focus on depression and have towards the functional role of valued action across a range of psychopathology. This has included randomized controlled trials treating crack/cocaine users (Magidson et al., 2011), smokers (MacPherson et al., 2010), and college student problem drinkers (Reynolds et al., 2011) in a group treatment approach; as well as individual therapy with depressed and anxious cancer survivors (Hopko et al., 2011), community individuals looking to increase their participation in organized religion (Armento et al., in press), and torture survivors in the Kurdistan region of Iraq (Bolton et al., in preparation). Newer projects are developing the approach in Spanish and Chinese to help immigrants who are only able/willing to receive therapy in the native language.

One often indicated strength of the Brief BA approach is its simplicity and straightforward nature, with a focus on four simple intertwined components.

- Monitoring
- Assessment of Life Areas, Values, and Activities
- Planning of Valued Activities
- Contracts to overcome barriers to valued action

My experiences with earlier incarnations of this workgroup has helped me consider how the focus of Brief BA can be further expanded beyond psychopathology to core behavior patterns that can be targeted in a bottom up approach to change personality traits such as conscientiousness (with specific acknowledgement to Brent Roberts regarding the modification of personality traits and Jacquelynne Eccles theoretical work on values and motivation). The goals of Brief BA actually fits quite well with increasing conscientiousness given its detailed structure, a focus on values, guided action, goal-setting, immediate feedback on progress and challenges, clear accountability, opportunity for remediation, and effort to develop long-term levels of behavioral persistence. Specifically, Brief BA
facilitates the efforts of individuals to monitor their daily activities and subsequently identify alternative activities to introduce in one’s life that align activities with values. This process requires individuals to attend closely to existing schedules, plan their days, set goals, and persist in an effort to achieve behavior change.

By applying behavioral technique to conscientiousness-related goal structures and working with individuals to routinize changes in thoughts, feelings, and behaviors relevant to conscientiousness, we believe Brief BA could be useful for changing behavior patterns otherwise considered to be the result of traits and instantiate these new behavioral patterns as the product of newly-formed traits. For example, as the behavioral changes targeted in Brief BA that map on closely to the trait of conscientiousness are practiced and continued over time, we would expect that they ultimately reach a level of automaticity that is more reflective of trait-level changes.

There are several ways in which this approach can be applied meaningfully to older adults. One is medication management and other necessary behaviors that –specifically for those with low levels of conscientiousness- are often not given sufficient priority. Another potential connection is in the transition from full time work to retirement. We have used Brief BA for individuals in other life transitions and this one seems to be approachable in the same manner. In terms of the application of my work to the large goals of the meeting, I see two obvious directions. First, there may be ways that the Brief BA, given its flexibility, can be modified to better take into account the knowledge gained from basic research conducted by group members. Second, the compact nature of BA makes it ideal for complimentary use with other approaches at the center of work being conducted by other group members.
Lynn Martire:

Guiding Questions for Your Think Piece:

1. Please provide a brief description of the areas of your research that intersect with the agenda for the meeting.

   My research focuses on close social relationships and health; more specifically, how family relationships affect, and are affected by, the health of older individuals living with chronic illness. I am interested in how we can strengthen the effects of behavioral interventions, and maintain these benefits over a longer period of time, by incorporating a close family member (e.g., spouse or adult son/daughter). I have developed and evaluated such family-oriented interventions for late-life knee osteoarthritis and depression, and I also conduct EMA research to examine bidirectional associations between relationship factors and patient daily functioning.

   In addition to my own intervention work I have conducted systematic reviews and meta-analyses of RCTs testing family-oriented interventions for chronic illness, and thus I am familiar with the strengths and limitations of this area of research. Through a Mid-Career Development Award from the NIA, I am collaborating with a national working group to identify important future steps in strengthening the next generation of couple-oriented interventions for chronic illness.

2. What would you characterize as the reasons your approach has worked? How does it work? How would you envision harnessing what you have learned from your work to advance the goals of this meeting?

   There is growing empirical evidence for the linkages between relationships and health, and various conceptual frameworks provide the foundation for dyadic intervention (e.g., Social Cognitive Theory, Self Determination Theory, and Stress and Coping Theory). Unfortunately, little research has applied theory to determine how successful dyadic interventions work. Putative mechanisms depend on the outcomes of interest but include family member knowledge and attitudes, validation of concerns, increased autonomy support, perceived competency, self-efficacy, and health behaviors.

   Many of the important next steps for family-oriented intervention research also apply to behavioral interventions more broadly, including the need to build impactful yet cost-effective interventions, test innovative methods of intervention delivery, and assess mechanisms of intervention effects.

3. What do you see as the potential of this research to inform interventions aimed at mid-life and older adults – i.e., is there potential for expansion, application to an older age group, use in a different context, etc.?

   Family-oriented interventions for late-life chronic illness hold great promise. A dyadic approach seems especially valuable for adults in midlife, when chronic conditions begin to emerge and behavior change is critical (e.g., increased physical activity and improved diet). In addition, it is important to consider how a socially-based approach may benefit the
(growing) population of older adults who do not have close family or friends and are especially at risk for morbidity and mortality.

4. What research gaps would need to be filled to advance such goals?

There are numerous directions for future research in this area. First, interventions are likely to be more impactful if they are tailored to the needs of older adults and their families, but little research has focused on developing tailored interventions that can be easily disseminated. In a tailored approach, the dosage of a specific intervention module would depend on characteristics of the dyad, and could also change for that dyad over the duration of the intervention. The potential advantages of tailored interventions include increased participant engagement and increased potency of the intervention. Second, we need to have a better understanding of how relationships affect illness management. For example, we know that the quality of a patient’s marriage affects long-term outcomes such as recurrent health events, hospitalization, and survival, but what are the proximal effects of an intimate relationship that lead to these more distal health outcomes? A few potential pathways have received relatively little attention in this regard, such as emotion regulation (e.g., parasympathetic activation) and health/risk behaviors (e.g., physical activity, dietary adherence, smoking or alcohol use, medication adherence, and sleep practices). These questions are perhaps best answered with repeated measures designs in which both partners are assessed daily or throughout the day. Relatedly, research aimed at identifying moderators of within-dyad variability could tell us how to tailor behavioral interventions (e.g., who may benefit most from a family-oriented intervention, and what is the best timing and amount of such an intervention?).

A third research gap is in the area of intervention delivery methods that help dyads to practice new skills in their daily lives, thereby improving the chance of long-term gains. The use of mobile technology to deliver interventions as individuals go about their daily lives based on data collected prior to or during intervention has been shown to be effective for a variety of health behaviors and psychological or physical symptoms. This approach has received little attention in interventions for older adults and their family members.

References


Please provide a brief description of the areas of your research that intersect with the agenda for the meeting.

Our research intersects with the meeting agenda in three ways. First, we study the construct of conscientiousness from a life-span perspective (Jackson et al., 2009). Impulse control is part of conscientiousness, which is one of the risk factors identified in the agenda as having pervasive ramifications for successful aging (Roberts, Lejuez, Krueger, Richards, & Hill, in preparation). Also, industriousness, which could be defined as the persistent pursuit of goals in the absence of objective reward structures (e.g., intrinsic motivation) is also part of the construct domain of conscientiousness (Roberts et al., 2005). Much of our work on conscientiousness has been motivated by a desire to understand the life course developmental patterns of change found in this trait domain. In particular the domain of conscientiousness shows a clear propensity to increase with age (Roberts, Walton, & Veichtbauer, 2006). Specifically, people become more self-controlled with time and experience (Jackson et al., 2009).

The second way in which our research overlaps with the meeting agenda is in the investigation of the overlap and differentiation of personality traits from motivational constructs, such as major life goals (Roberts & Robins, 2000). Based on our research, when motivation is defined clearly as what one desires, and operationalized accordingly, the overlap between risk factors, such as low self-control, and motivation, is modest at best. Moreover, when constructs are both used to predict relevant outcomes, it is typical to find that traits and motives complement one another, and are thus independent sources of human functioning that both contribute to valued outcomes, such as positive aging.

The third way in which our research pertains to the agenda is that we are currently considering ways in which one could change levels of conscientiousness through interventions. We know from our ongoing meta-analytic work that conscientiousness can be changed through typical clinical interventions (Roberts, Lejuez, Krueger, Su, & Hill, in preparation). Nonetheless, most prior work has not explicitly focused on changing conscientiousness, but has studied it as a non-specific treatment effect of therapeutic interventions intended to improve psychological functioning in patients currently experiencing some form of distress. In collaboration with Carl Lejuez, we have conceptualized a theoretically informed intervention that we loosely refer to as “depth behavioral activation.” This system applies the typical short-term behavioral approach to long-term change in behavior patterns (e.g., personality traits). We refer to it as “depth” behavioral activation because the conceptual frame is informed by doing whatever is necessary to not only change behavior, and concomitant thoughts and feelings, but to help individuals reach mastery in their behavioral change such that it becomes relatively permanent change—that is, the new pattern becomes trait like, and therefore does not require continual environmental monitoring or intervention.

Are there particular lifespan-relevant motivational challenges that need to be overcome or specifically targeted?
Older people become less likely to change with age (Roberts & DelVecchio, 2000) and less likely to be persuaded by motivational challenges (Visser & Krosnick, 1998). Generally speaking, they may be less motivated to change. Moreover, the motivations that guide behavior change with age (Frazier et al., 2000) thus any intervention will have to consider the population changes in motivation that occur over the life course.

What do we know about aging and life course development that raises special concerns and/or opportunities for motivation-related interventions?

My concern is somewhat random and not informed by “life course development” per se. But, I have to ask whether “motivation–related interventions” are the right idea in the first place? Like many modes of thinking, this puts the onus of responsibility on the individual—as people have said about our research on personality development and assessment, “you are blaming the victim.” Obese people are fat because they lack the motivation. People could exercise more, but they are lazy, etc. I wonder whether interventions targeting motivation may be poorly received because the target audience will perceive the effort as endeavoring to change something global, internal, and stable. Alternatively, adopting an asymmetric paternalistic approach might be more effective (Loewenstein, Brennan, & Volpp, 2007)? Rather than trying to change individuals, simply change the playing field for everyone? Taxing cars, incentivizing walking, building cities differently, all of which might get people to expend an extra 200 calories per day and thus help to eliminate obesity and its sequela like diabetes and heart disease, might be a better way of going about “changing” people.

It would also be prudent to let the efforts to change behavior and motivation in middle and old age be informed by similar efforts to change psychological constructs in childhood. Given the equivocal, if not outright ineffective efforts to apply prototypical social cognitive/motivational changes to children with aggressive tendencies (Conduct Problems Prevention Research Group, 2011; Multisite Violence Prevention Program, 2009; see Hill et al., 2011 for a review) or ADHD (Molina et al., 2009), it is not clear that attempts to change social cognitive motivational systems have lasting effects on behavior patterns like those being considered here.

What basic research questions need to be investigated before moving to interventions?

How about settling on a definition of motivation? Once you’ve got that puzzle solved, how about some accepted system for assessing motivation? The “field” of motivation is like the Wild West. Almost anything measured and any way of measuring human phenotypes has been labeled as a “motivation.” Some conceptual and methodological rigor would be helpful. It is difficult to intervene on a moving target.

How can research on basic mechanisms be combined with field-based approaches to behavior change?

How can they not be informed by field-based approaches? Our interventions have to be robust enough to work outside of the well-controlled environments in our labs and generalize to populations other than the elite, 19-year old college students we typically study.
What are likely good targets for intervention for midlife and older age?

Health—both physical and mental.

References


Please provide a brief description of the areas of your research that intersect with the agenda for the meeting.

Currently in its 8th decade, the Study of Adult Development is one of the longest longitudinal studies of adult life ever conducted (Vaillant 2002). Now in their 80s and early 90s, approximately 150 original participants (90 Inner City men and 60 College men) are still alive and participating in the Study. For 71 years, Study members have been assessed repeatedly on measures of social functioning and physical and psychological well-being. The original sample (N=724) consists of two groups at opposite ends of the socioeconomic spectrum: the College and Inner City cohorts. The College cohort (the “Grant Study”) consists of 268 Caucasian men from the Harvard classes of 1942-1944 selected because they were in the top half of their class academically and without known physical or mental difficulties. The Inner City cohort (the “Glueck Study”) consists of 456 Caucasian men selected as matched controls for a prospective study of juvenile delinquency. They were chosen because they did not manifest serious delinquency; and they were individually matched with the delinquent group for ethnicity (predominantly Irish- and Italian-American), for limited intelligence (mean IQ = 94), and for living in a high-crime neighborhood. Excluding death, attrition from withdrawal in both cohorts after 71 years is 16% (less than ¼% a year).

At the time of initial study, the men had complete physical examinations, somatotyping, and home interviews that provided unusually complete medical histories. Evaluations of parental social class, IQ, and school records were available on all the men, as were extensive three-generation family histories of ethnicity, mental illness, alcoholism, and delinquency. Estimates of childhood strengths and of inner city risk factors were made by individuals blind to the course of the men’s lives after adolescence.

On all Study men, assessments of psychosocial functioning and mental and physical health have been conducted using:

1. Biennial questionnaires
2. In-depth interviews conducted every 5-10 years
3. Health records obtained from primary care physicians every 5 years
4. Age 75-80 social functioning: videotaped marital interactions, attachment interviews, and repeated daily assessments of social interactions, mood, and health
5. Age 80-90 social neuroscience: neuropsychological testing, wellbeing assessments, neuroimaging, DNA collection

Areas of research that intersect with the meeting agenda:

- Links between social relationships and physical and emotional wellbeing
- Childhood adversity (SES, familial) as predictor of later morbidity and mortality
- Late life attachment security, relationship functioning, and health
• Next phase of research will explore factors underlying health maintenance behaviors and risk for metabolic syndrome in middle aged children of original cohorts

2) Are there particular lifespan-relevant motivational challenges that need to be overcome or specifically targeted?

Attending to individual differences in the experience and meaning of late-life health challenges is essential to understanding how people cope with those challenges. We know that responses to disability and infirmity run the gamut from isolation and avoidance to active coping and engagement of social supports. The same health challenges that elicit support-seeking and support-giving behaviors in one octogenarian may in another provoke self-protective responses that diminish access to support and reduce likelihood of adaptive health-maintenance behaviors.

These differences arise in part from how individuals resolve certain motivational tensions that are relevant at all stages of life but are especially salient for older adults. These include: (1) preserving and fostering interpersonal connections while maintaining a sense of independence and personal autonomy (sometimes referred to as autonomous relatedness); and (2) realistic acceptance of the declines and limitations of aging while maintaining positive regard for the aging self that motivates health-preserving behaviors.

3) What do we know about aging and life course development that raises special concerns and/or opportunities for motivation-related interventions?

Aging reverses the normative developmental trend from absolute dependence in infancy to healthy independent physical functioning in adulthood. As physical and cognitive declines create real needs for assistance from others, individuals' core sense of autonomy and emotional security may be threatened. Latent concerns about whether important others can be depended on for help may be activated, which may lead to maladaptive (and seemingly irrational) reactions to the challenges of aging (Shaver and Mikulincer, 2004). Security of attachment has been linked empirically with physical health, and an understanding of individual differences in attachment security may allow for tailoring interventions in ways that allay rather than exacerbate fears about loss of personal autonomy and/or lack of the availability of needed supports.

Negative images of what it means to get old have been linked with health decline in later life (e.g., Levy, 2009). Aging stereotypes may foster more or less adaptive behavioral responses to health challenges by shaping motivation for self-care or self-neglect. Interventions that target negative images of aging may offer an opportunity to affect motivation in older adults. Better understanding of individual differences in models of attachment to others and aging stereotypes may be crucial
to designing interventions that allow older adults to access available resources and maximize healthy adaptations to aging.

4) **What basic research questions need to be investigated before moving to interventions?**
   
a. To what extent and in what contexts do health-related threats activate older adults’ attachment fears and maladaptive behavioral responses?
b. How do aging stereotypes affect motivation for self-care in middle-aged and older adults?
c. To what extent do person-specific models of attachment and aging interact with particular contexts (e.g., doctor visits, marital interactions) to shape motivations and behaviors related to self-care and adaptive functioning?
d. Are there particular developmental windows of opportunity (e.g., mid-life vs. early retirement) for fostering more positive images of aging and more adaptive strategies in responding to health threats?

5) **How can research on basic mechanisms be combined with field-based approaches to behavior change?**

   Studies can incorporate measures that tap into individual differences in attachment-driven avoidance or help-seeking behaviors that may explain variations in responses to motivational interventions. Similarly, research can include measures of attitudes about aging, about older adults in general, and about the aging self in particular. These may be tested as moderators of responses to field-based interventions that attempt to foster behavioral change.

   To better understand mechanisms during field-based intervention studies, it may be useful to include techniques such as experience sampling approaches that can capture daily support-seeking and support-giving, relative attention to vs. avoidance of health concerns, and context-specific images of the aging self.

References: