

Planning Meeting on Work, The Workplace, and Aging

**National Academies of Sciences, Engineering, and Medicine
Division of Behavioral and Social Sciences and Education
Committee on Population
in collaboration with
the Committee on National Statistics and
the Board on Behavioral, Cognitive, and Sensory Sciences**

September 5-6, 2019

The Keck Center of the National Academies
500 Fifth Street NW, Washington, DC 20001

March 10, 2020



This meeting summary was prepared by Bethany Stokes, Rose Li and Associates, Inc., under contract to the National Institute on Aging (NIA). The views expressed in this document reflect both individual and collective opinions of the meeting participants and not necessarily those of NIA. Input provided on this meeting summary by the following individuals is gratefully acknowledged: Emma Aguila, Lisa Berkman, Pam Blumenthal, Gary Burtless, Ernest Gonzales, Eric Kim, Margie Lachman, Rose Maria Li, Nicole Maestas, Lis Nielsen, John Phillips, Susann Rohwedder, Cort W. Rudolph, Nancy Tuveesson, Mo Wang.

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Meeting Summary

Introduction

On September 5-6, 2019, the National Academies of Sciences, Engineering, and Medicine in collaboration with the National Institute on Aging (NIA) convened a planning meeting to articulate a research framework that can help to explain workplace qualities and policies that promote health and support work into older ages. Work (both paid and unpaid) is a commonly neglected determinant of health, especially because the nature of work has changed over time and recently some changes have not been for the betterment of the worker. Although they are living and working longer, evidence suggests that many workers face stress in the workplace and lack work-life balance. Understanding of the pathways that link work and health can lead to evidence-based interventions to better support and motivate older workers. Study designs should consider outcomes beyond mortality, income, and productivity—such as wellbeing, mental health, and psychosocial resources. In this way, decision makers will be equipped with the information necessary to improve public policy and workplace structures to induce long-term improvements for older workers.

The goal of the meeting was to navigate current research findings, discuss limitations and challenges faced by investigators, and identify outcomes and interventions to improve the wellbeing of older workers before and after retirement, with a focus on middle- and low-wage workers and those with significant caregiving responsibilities. Experts provided background in four broad areas: (1) psychology of work, (2) workplace conditions and practices, (3) work pathways and constraints to working at older ages, and (4) macroeconomic change and employment at older ages. The agenda and participant list are available in Appendices 1 and 2, respectively.

Each session was followed by a discussion, during which meeting participants identified gaps in existing research and data, data collection needs, and possible actions and lines of research that would help to expand the knowledge base. The following suggested actions emerged from the discussions:

- Promote older worker health through multi-level interventions
- Increase collaboration between researchers and employers to increase access to employer data and better measure the effects of interventions
- Support research that informs public policy to protect vulnerable populations and facilitate better working conditions
- Identify challenges to data access, study design, and outcome measurement

The results of research into work, aging, and health will inform the development of public policy and workplace interventions, as well as partnerships with business and industry, to ensure that the workplace is a welcoming and fostering environment for older workers, a population that is valuable to the current labor force.

Session 1: The Psychology of Work

Purpose in Life, Work, and Health in the Context of an Aging Society

Eric Kim, Harvard University

The literature from empirical and theoretical research defines purpose as the degree to which people are directed and motivated by valued goals and as one factor that helps to create meaning in life. In a positive feedback loop, work and volunteering might contribute to purpose in life, which in turn contributes to more enriching work experiences and the ability to work longer. A high sense of purpose in life is associated with positive health behaviors (e.g., preventive health care use, physical activity), better biological function (e.g., inflammation moderation, glucose regulation), stress buffering, and improved physical health outcomes (e.g., reduced risk for cardiovascular disease and stroke) over time—which in turn might help explain why purpose is also associated with reduced health care utilization and expenditures.

Health and Retirement Study (HRS) data show that levels of purpose in life decline substantially after age 70, close to the age when many people in the United States retire. Therefore, study of the rapidly aging population in the context of purpose in life should evaluate whether (1) work fosters purpose in life and (2) whether purpose fosters delayed retirement.

Results from a Gallup Poll revealed that only 29 percent of employees in the United States and Canada feel engaged at work. Although these two countries had the highest level of engagement of the countries sampled, these results suggest that employers should be incentivized to foster meaningful work, which is positively related to commitment, job performance, and job satisfaction and negatively related to burnout, turnover, and stress. Management consulting companies, such as Deloitte, Boston Consulting Group (BCG), and PricewaterhouseCoopers (PWC), are already discussing sense of purpose with human resource departments. However, the interventions they suggest in their reports are often not evidence-based, which highlights the potential for partnerships between interested companies and researchers.

Employers can foster purpose in life and meaningful work through job crafting, superordinate framing, and other exercises. With job crafting, employees proactively redesign their occupations to improve the fit between their skills and job requirements and their needs with opportunities. Observational studies have shown that job crafting motivates employees to delay their retirement. With superordinate framing, employees reframe a meaningless task as one of several tasks needed to achieve a higher purpose. Yoon and colleagues conducted four experiments on superordinate framing, recruiting workers from Amazon Mechanical Turk, a crowdsourcing marketplace that is used by employers seeking to harness distributed workers over the Internet to complete “microtasks,” with mixed results. Both interventions are promising, but would benefit from more rigorous study through randomized controlled trials.

Future directions for basic science include establishing a centralized database of existing cohort studies with data on work attributes and health, as well as adding work attribute, meaningful work, and purpose items to existing cohorts. Researchers could attempt to evaluate the impact

of the gig economy and automation on meaningful work and whether meaningful work acts as a buffer against cardiovascular disease and burnout. On the translational side, through partnerships with industry, researchers can gain access to unique and large datasets and subject pools and large-scale dissemination of interventions.

Healthy Aging: Psychosocial Factors at Work

Margie Lachman, Brandeis University

Psychological, social, and physical protective factors are associated with better health in later life. Among these factors, sense of control, social support, and physical activity are not only predictors of functional health, but also malleable and therefore potential targets of interventions. Lachman and Agrigoroaei observed that the more protective factors a person has, the greater will be their ability to maintain functional health over a 10-year period. In addition, as the number of protective factors increases, the difference in functional health between younger and older adults decreases. They also observed similar patterns with cognitive functioning. Episodic memory and executive functioning increased and declines in reasoning over a 10-year period were reduced in response to more protective factors. Work can provide experiences that are protective for maintaining health and cognitive abilities. This can include social engagement, cognitive stimulation, and physical activity. Study of how these protective factors can be modified and maintained into retirement through substitute activities will inform efforts to promote functional health and reduce disability later in life.

Educational attainment and income are directly related to health and wellbeing; cognitive declines occur earlier in individuals of lower socioeconomic status (SES). Individuals with higher educational attainment have better functional health, episodic memory, executive functioning, and overall life satisfaction than people with lower educational attainment. However, some people with low SES display resilience against poor health outcomes. Results from several studies by Lachman show that psychological and behavioral factors, such as a high sense of control and engagement in cognitively stimulating activities, can mitigate SES-mediated differences in health and cognition.

Lachman and Weaver found that individuals reporting low education and low sense of control have significantly reduced functional health, while individuals reporting low education but a high sense of control have functional health equal to that of individuals with high education. Sense of control also reduces mortality risk in individuals with low SES, which implies that this factor, and possibly other protective factors, may be a target of interventions to attenuate negative health outcomes in older populations. Further, people with low SES are more vulnerable to accelerated aging, yet may be more responsive to psychosocial and behavioral interventions. In addition to the moderating effects, Lachman and Liu found that cognitive and physical activity mediate the relationship of education with executive function and memory. Their results show that education has direct associations with an individual's cognitive health and that differences in the frequency of cognitive and physical activity can help to explain this association. Those who have higher levels of education are more likely to be actively engaged, which accounts for some differences in cognitive aging outcomes.

Innovation and creativity are important features of the workplace. An analysis by Jones and colleagues revealed that the frequency of Nobel Prize awards and great inventions peaks at ages 35-45 and declines rapidly thereafter. This finding is often used to suggest that older adults are less innovative than younger workers. Lachman and her colleagues, Jaffe and Kaltenberg, examined innovation using a database from the U.S. Patent and Trademark Office that includes data on 1.5 million inventors who received one or more patents between 1976 and 2017. Although patenting activity peaks for men in their 40s and for women in their late 30s, thousands of patents are also acquired later in life. Age differences were found on patent features with older adults superior (e.g., backward citations) on certain measures and younger adults excelling on others (e.g., forward citations). Further, some evidence suggests that age-heterogeneous teams do well on some key patent attributes (e.g., originality). These findings suggest that older workers have much to offer the workplace, including experience, crystallized intelligence, institutional knowledge, and generativity/mentoring.

Future research efforts should explore how individual differences (including personality) influence work decisions and health outcomes; consider the benefits of replacing work-related activities in retirement to support their physical and cognitive health; and compare the benefits experienced by older and younger individuals who work together, in various domains.

The Cognitive and Emotional Contributions of Older Workers to Workplaces

Cort W. Rudolph, Saint Louis University

Older workers provide beneficial cognitive and emotional attributes to the workforce. Viewing experience as a temporal metric, older workers possess more experience, on average, than younger workers. Experience can be partially equated with both explicit and tacit knowledge: the former is easy to articulate, record, and share, while the latter is based on skills and ideas and is difficult to express. Cognitive abilities tied to basic information processing (i.e., fluid mechanics) tend to decline with age, but cognitive abilities tied to experiential knowledge (i.e., crystallized pragmatics) can be maintained over time. The assumption, therefore, is that older workers' cognitive contributions to the workforce are mainly derived from application of their explicit or experiential knowledge. However, the relationship between age (as a proxy for experience) and work outcomes are weak, perhaps because the relationship is nonlinear or subject to age-related mediators or moderators, which warrants further study.

Aging is accompanied by increased capacity for emotional regulation and greater salience of social motives. Carstensen and colleague's socioemotional selectivity theory (SST) of lifespan development hypothesizes that individuals self-contextualize the passage of time by adjusting time horizons with advancing age. This adjustment is then reflected in the future time perspective (FTP). For example, younger individuals prioritize social- and knowledge-related goals to maximize their future gains because they have an expansive FTP. In contrast, older individuals prioritize more immediate and present goals, such as maintaining existing relationships and pursuing emotionally meaningful goals, because they have a constrained FTP.

Zacher and Frese adapted the concept of FTP to the occupation context (OFTP). Previous studies report associations between OFTP and various work outcomes, such as job satisfaction

and work performance. Rudolph and colleagues conducted a meta-analysis to examine the antecedents and outcomes of OFTP to provide additional knowledge to guide future research. They found that age and emotional exhaustion are associated with a narrower OFTP, whereas job satisfaction, task performance, and work engagement are associated with a broader OFTP. This finding suggests that employees who are motivated and content at work visualize a better future within their occupation. When compared to a measure of selection, optimization, and compensation strategies (SOC), OFTP was the dominant predictor of emotional exhaustion, job satisfaction, and work engagement, while SOC was the dominant predictor of task performance.

A path analysis found that age contributes to both OFTP and SOC strategies that subsequently interact to influence exhaustion, satisfaction, performance, and engagement. Age has an indirect effect on all four outcomes, and the strongest effects occur through OFTP, which explains relatively more variance in three of the four outcomes. OFTP and SOC strategies represent independent pathways linking chronological age to these outcomes. The link between age and task performance flows through the SOC strategies path and is a goal-striving mechanism. The link between age and motivation/wellbeing flows through the OFTP path and is a goal-choice mechanism. This differentiation can inform future research efforts.

Overall, successful aging in the context of work is an emerging area of research. Interventions can be crafted using the OFTP model to promote better health and to help workers feel a sense of belonging in the workplace. Interventions using the malleability of FTP have been implemented with success outside of the workplace, but further research is needed to inform development of interventions in the workplace. Future research should consider the limitations of studying age (as a proxy for experience) and focus on identifying the explanatory mechanisms that link outcomes back to age.

Discussant Presentation

Laura Carstensen, Stanford University

During the 20th century, life expectancies increased by an average of 30 years, but these “extra” years are not being used effectively. Young ages are defined by milestones such as going to college, getting married, and buying a house, but the final 30 years of life are not characterized by monumental life moments and provide an opportunity for intervention and redesign.

Workers experience work differently, and their experiences evolve over time. Workers report that money and meaning are the two most important factors when navigating their lives, and while money has obvious implications, meaning is more complicated. An emergent phenomenon of “workism” denotes how workers view work with the same ideologies previously associated with religion. Today, work is used to derive identity, purpose, and community, but it does not always deliver.

Many perceived generational differences are widely exaggerated in the context of work. Society insists on stereotypes that older workers are significantly less productive than younger workers, but evidence does not support these assumed declines in job performance.

Mixed-age teams will be a major product of increasing age diversification in the workforce. Previous literature alludes to the possible differential qualities of older workers, but it is not clear which older worker behaviors impact the workforce differently from those of younger workers, whether negative or positive. Older workers increase the stability and productivity of organizations, causing teams to be more satisfied and less likely to experience turnover. In a recent study in which workers could choose tasks, younger workers tended to choose tasks that would advance their career while older workers tended to choose tasks that would help a co-worker. These results may provide insight into the contributions of older workers to the workforce.

Retirement, whether partial, permanent, or transitional, induces cognitive decline in older workers with low-complexity jobs, while workers with high-complexity jobs benefit more from retiring permanently than returning to work. Some researchers argue that this finding reflects the cognitive reserve, resilience, or environmental resources of the worker. An alternative explanation is that it reflects access to stimulation. Workers with low-complexity jobs may have few outside resources and therefore may experience cognitive decline because they cannot substitute the stimulation provided by work, while workers with more financial and personal resources have travel and educational opportunities to substitute for any loss of stimulation from work.

Lastly, if cognitive function and long-term health are to be improved, workplaces must be the target environments for interventions. But first, the implementation strategies must be better understood to maximize any beneficial effect for the majority of older workers.

Discussion of Session 1

Moderator: Laura Carstensen, Stanford University

Discussion centered on the heterogeneity of work experiences, their causes and health implications, and optimal research approaches. Interventions to improve cognitive decline among individuals with various SES levels require redesign of the workplace to ensure dignity of work, which translates to a job that fully utilizes a worker's potential, provides high stimulation and flexibility, and improves worker health.

Multi-Level Systems Approach Better Captures Workplace Dynamics

A multi-level systems approach, instead of a scientific or medical perspective, to study interventions is needed. Work and health have a bidirectional relationship, yet researchers tend to look for linear relationships, which may not fit the reality or capture feedback loops. In addition, most workers do not exist in a silo. By considering the worker, supervisor, and peers, individually and collectively, researchers can visualize a work-health model that accounts for workplace dynamics. However, this approach is complicated by the intensity of data required to infer causal relationships.

Understanding Implications of Job Insecurity through Comparative Research

Currently, the burden for fostering FTP falls on the worker rather than the organization. In addition to managing one's own FTP and productivity at work, older workers feel pressure to maintain an optimistic and perpetually available work persona despite poor working conditions to maintain job security. A German longitudinal study found that high job insecurity was the largest negative predictor of future mental wellbeing. Comparative studies offer the best method to study the impact of job security. Studying practices across multiple countries can elucidate what practices influence perceptions of job security.

Collaboration with Industry and Policy Makers

Companies are interested in academic research but are concerned that workplace interventions increase their exposure to legal issues, particularly age discrimination. Navigating this issue is crucial to increasing collaboration with firms and developing effective organization-wide interventions. Interventions would also be greatly aided by the advancement of public policies that mandate good working conditions. However, assessing the impact of policy-driven intervention is complicated by the lack of a control group. Fischer has tested the use of a synthetic control group for future policy outcome assessments.

Additional Research Suggestions

Participants suggested the following research efforts:

- Performing ethnographic studies to understand the influence of cultural and organizational practices on the construction of time horizons.
- Conducting a clinical trial to assess the effects of different types of cognitively stimulating tasks in cohorts with differing levels of education. The goal would be to identify a task that could serve as an intervention to prevent cognitive decline, specifically in populations with low education and low-complexity jobs.
- Testing the competing pathways that lead to differential predictions of motivational and performance outcomes. Studying these theories individually and integrating the outcomes will aid in the development of a well-rounded intervention with a focus on specific mechanisms.
- Holding a pitch competition with the largest human resource and consulting companies and dispersing the top ideas randomly to each company. Each idea would then be studied for effects and feasibility in a real work setting for later translation to RCTs.

Participants also commented on the prevalence of observational studies in this area. Longitudinal studies and RCTs will generate the additional and more reliable data needed to standardize interventions and methods. Viewing observational data through the perspective of clinical trials may greatly benefit translational interventions.

Session 2: Workplace Conditions and Practices

Working Conditions and Work Capacity among Older Workers

Nicole Maestas, Harvard University

Work and health exist in a bidirectional relationship of influence. An individual's health influences decisions about what types of positions are an available and appropriate fit, while working conditions may worsen or benefit an individual's health.

Older workers appear to be sensitive to working conditions. Unlike in European countries, the study of working conditions in the United States is lacking, which limits the ability to develop potential interventions. To rectify this research gap, Maestas and colleagues created the American Working Conditions Survey (AWCS) and surveyed a nationally representative sample of workers about perceptions of work characteristics. Some characteristics associated with "good jobs" are fewer physical demands, increased schedule flexibility, job security, appropriate wage, autonomy, and resourceful environment. The survey found that older workers (ages 62-71) tend to have better working conditions than younger workers. As expected, better working conditions, such as those listed above, are associated with fewer health problems in workers. AWCS participants choose between two job descriptions with randomized differences in autonomy, physical demands, and wages. Older respondents chose jobs with more paid time off, less physically demanding tasks, and greater autonomy despite lower wages. Non-working older adults reported that only jobs with schedule control, fewer physical demands, and autonomy could entice them to return to the workforce.

Work impacts health, but investigation of the converse relationship is lacking. Every job consists of a variety of tasks requiring a mix of knowledge, skills, and abilities. The Occupational Information Network (O*NET), funded by the U.S. Department of Labor Employment and Training Administration, classifies jobs according to 52 task-related abilities divided into four domains of function: cognitive, psychomotor, physical, and sensory. Each occupation in the database is rated on 52 abilities in all four domains to determine the required skills and traits. In an ongoing study by Maestas and colleagues, respondents rated themselves on all 52 O*NET abilities. Preliminary results find that men reported higher scores than women, black respondents reported a broader spectrum of scores than white respondents, college graduates reported higher job-related abilities than non-graduates, and, most importantly, self-reported ability scores did not vary by age. By integrating these scores with O*NET data, the researchers constructed measures of work capacity based on abilities. Older workers appeared to be qualified for the same number of jobs as younger populations, but approximately 30 percent would not be available to them because they required a postsecondary degree. This finding that educational attainment constrains older workers raises questions about whether workplace interventions to train or recertify older workers in specific job-related tasks could increase their access to jobs requiring higher degrees.

Health capacity studies show that older workers display relatively low decay in job-related abilities and are healthy enough to perform many jobs. In addition, non-workers are interested

in working. The field should explore ways to improve working conditions to retain existing workers and attract non-workers to reenter the labor force, to offset the fiscal effects of population aging, as well as effects on productivity and economic growth. The longer people work, the more they contribute in taxes and the more they are likely to delay Social Security claiming.

Maintaining Engaged Well-being at Work: What Matters Most?

Joachim Fischer, University of Heidelberg

In the absence of workplace interventions, an individual's work-ability—or the ability to continue to work based on current work conditions and health—typically declines by 1.7 percent each year after age 40 because of a range of conditions such as musculoskeletal disorders, depression, burnout, sleep disorders, chronic stress, lack of purpose, and diabetes. An individual's work-ability is influenced by the interaction of four domains: health, competence, motivation, and psychosocial and organizational work. A Work-Ability Index (WAI) is used to measure the degree to which a worker's health is adequate to meet their job demands.

Theoretically, individuals who report good wellbeing and engagement with work will manifest better health outcomes. Researchers in Germany assessed perceptions of working conditions using a representative population sample linked to the national Social Security register and company-supplied information about supports for employee wellbeing. They found that individuals' attitudes toward work display a broad distribution. In this sample, autonomy, organizational fairness, and potential for skill development increased the likelihood of individuals adopting higher engagement and wellbeing attitudes, while high psychological, physical, and emotional demands increased the likelihood of individuals experiencing declines in wellbeing and engagement. Wellbeing and engagement increase with age, most likely reflecting a healthy worker effect (i.e., approximately 50 percent of German workers leave the labor force by age 60 because of feelings of disengagement or declining health). A cluster analysis of the Big Five personality traits found five distinct clusters, indicating the need to consider individual as well as workplace factors.

A significant challenge to the study of workplace wellness and engagement exists in the implementation of interventions. Marketing has proven to be a pivotal tool to integrate interventions within the public. For example, a positive advertising campaign was associated with reduced turnover among waste collectors. A study at a large chemical company found that the variable "joy and purpose" mediates between resources at work and work-related demands, having a direct effect on subjective health and an indirect effect on productivity. Changes in health behavior have less effect on productivity and subjective health than joy and purpose.

As an example of the challenges to implementing interventions in real-world settings, a study sought to change nutritional behavior in BMW workplace cafeterias. After trying to influence behavior through food labeling, BMW incentivized its chefs to produce healthy meals. The program led to a dramatic increase in the number of healthy meals sold in the canteen. The

canteen's patrons reported reduced risk of prediabetes and diabetes. The success of this intervention highlights the need to use a system-based approach, where strategies target every part of the problem.

Another study at BMW analyzed health and work parameters for each department to generate data about which environments were associated with better or worse health outcomes, personal or work-related resources, demands, and perceived health. Researchers used the data to produce a parsimonious prediction model of sick-leave rates for the following year. Inclusion of individual work-ability, health records, skill development potential, smoking status, purpose, and commitment best explained the predicted sick-leave rates, which indicate that focus on a single factor will not sufficiently explain workplace health. A path model revealed that leadership had the highest combined effect on the sick-leave rate because of its indirect impacts on job satisfaction, stress, and overall work-ability.

Although important, the impact of psychobiological factors and pathways on worker wellbeing and engagement have been underappreciated. For example, the concept of allostatic load infers that chronic exposure to stressful events leads to elevations in specific neurological responses. For example, heart-rate variability usually corresponds to better health outcomes. Research shows that supportive work environments can drastically increase heart-rate variability, thereby causing an individual to behave as a biologically younger individual. The opposite occurs when workers experience stress and exhaustion.

Overall, these findings indicate the need for multi-level interventions that account for psychobiological interactions within the work environment. Interventions of this nature are difficult to perform as RCTs but could benefit from the inclusion of stakeholders to appreciate the different needs, concerns, and resources of the researcher and organization to help more workers.

During the discussion after Session 2, Berkman asked whether situations exist in which worker health outcomes do not align with and limit productivity. Fischer answered that many biological outcome measures did not predict the sick-leave rate in his recent study. Typically, health outcomes become more strongly associated with productivity as workers age. Workers younger than age 45 do not show any alignment between health outcomes and productivity. Wang added that evidence from service and manufacturing industries show a weak but significant correlation between work-ability and job performance.

Age-related Workplace Practices from a Management Perspective

Peter Berg, Michigan State University

Organizational factors shape workplace practices that can enable or deter employment of older workers and have implications for worker health. Workplace practices, such as flexible schedules and mixed age teams, are typically established by management, who may have to negotiate with employee representatives or comply with government mandates. Their interests will influence the structure and range of workplace practices offered, as well as the conditions

under which they are offered. Further, managers at different levels within the same organization may have different interests.

Much of the literature treats workforce aging as homogenous, without distinguishing among organizational characteristics and institutional factors. Many studies focus on what practices should be without linking the practices to any specific organizational-level problem. Organizations look at workers as skills and focus on managing those skills, including the flow of skills in and out of the organization. Managers are concerned about the loss of both the quantity and quality of human capital as older workers retire.

A comparative study in the United States and Germany collected data from interviews with organizational leaders and employee focus groups across eight facilities in three multinational manufacturing companies. The interviews focused on perceived threats of workplace aging, typical workplace practices to manage older workers' skills, and how country-level institutions affect organizations' response to workplace aging. High-level leaders were concerned about the quantity of human capital, while supervisors were concerned about losing key older workers with high-quality human capital.

Retirement predictability and skill tracking are two practices that can critically influence a manager's perception of older workers. In the current workforce, organizations have shifted to defined contribution retirement savings systems, causing an expansion of the retirement age window and the clouding of predictions. With skill tracking, companies monitor for necessary skills that may be lost as expert workers retire and continuously train new employees to minimize that potential loss.

Managerial perceptions of aging have also been investigated in terms of flows of skills into and out of the workforce. Practices that prevent or delay skills from leaving the workplace include flexible work schedules, documentation of skills, special shift positions, contract work, and wellness initiatives. Primarily utilized in Germany, partial retirement and working time accounts (which let workers bank extra hours over the years) are used to manage the outflow of skills to remove the unpredictability of the expanding retirement age, allow the employer to anticipate a departure of skills, and facilitate retirement for unproductive workers. Practices to increase the inflow of skills include recruiting and hiring, mixed-age teams, and formal training. Mixing experience levels within a team generates new skills and increases knowledge transfer between workers.

One significant difference in work practices between the United States and Germany is employee representation. In Germany, work councils address age-related issues and solutions while aiding workers' negotiation of partial retirement at the industry level. Unions in the United States are primarily focused on salaries and maintaining benefits. The addition of a work practices advocate or council may improve health outcomes for workers, especially in terms of schedule control. Low-skilled workers have very little control over their schedule, causing them to shift to part-time jobs, which increases their schedule control but reduces their wages. Protecting this vulnerable population through government-mandated paid leave could be an

initiative for a working conditions council. Interventions need to consider a variety of contexts and make this practice available to all workers regardless of age.

Data on both the German and American workforce reveal that organizations are focused on reacting to skill upsets within their workforce, rather than on committing to ongoing workplace wellness. Viewing aging in the workforce as a human capital flow issue, as opposed to a burdensome loss of skill, would allow supervisors and leaders to better focus on practices to retain essential skills in the workplace. The accumulation of evidence of the health effects of certain workforce practices can inform public policy solutions that protect vulnerable older workers.

Workplace Policies from a Life Course Perspective

Erin Kelly, Massachusetts Institute of Technology

Workplace policies and practices that offer schedule flexibility and paid leave motivate workers to remain in the workforce longer and improve worker health, specifically older workers and those with caregiving responsibilities. In the United States, workers have no federal rights to paid leave, legislation on working hours is minimal, and employment at will applies to most workers. Therefore, U.S. workers feel expected to be constantly “on call,” which limits work-life balance and reinforces job insecurity. In addition, they endure significant responsibility for unpaid caregiving and self-management of their own health care over the lifespan, contributing to already high stress levels. Together, these features paint the U.S. workforce as overwhelmed, stressed, and ill-equipped to maintain work-life balance.

Research with the Work, Family, and Health Network (WFHN) was based on the premise that a good job is one that not only provides decent wages, but also addresses psychosocial factors and how work affects life. A recent WFHN study revealed that schedule control is a critical predictor of health and some occupations offer greater schedule control. Subsequently, researchers analyzed the effects on an intervention with two populations of workers, IT professionals and certified nursing assistants (CNAs), in the context of time control.

Before the intervention, IT professionals reported long work hours, extended periods of high work intensity, and the perceived need to always be available to work, which manifested into negative health outcomes, such as poor sleep quality, limited exercise, and exhaustion—especially among older workers. CNAs reported unpredictable overtime and rigid attendance policies caused by lean staffing. Because these policies affected their ability to care for themselves or others in their personal sphere, they shifted from full-time to part-time positions, further limiting control of their schedules and reducing their wages.

This study’s interventions focused on providing schedule control for caregiving responsibilities and lightening workloads using a team-based process to create social change. During training workshops, workers and managers from both test populations (IT and CNAs) discussed current working conditions and expectations, as well as workers’ caregiving and health concerns. The target outcome of these workshops was for the manager and worker to develop a new

schedule to optimize work tasks and outside responsibilities to increase the overall wellbeing of the worker.

Post workshop, the IT professionals reported higher job satisfaction, sleep quality, schedule control, and employer support for caregiving responsibilities, as well as lower burnout, stress, work-family conflicts, and turnover rates. Older IT professionals believed this intervention delayed their desire to retire. CNAs reported increases in safety culture and co-worker support and decreases in smoking, stress, and psychological distress. Older CNAs who double as primary caregivers experienced significant reductions in stress and psychological distress. In both cohorts, older workers with high cardiometabolic risk saw significant reductions in their cardiometabolic risk scores after the workplace intervention.

Further study of paid leave for personal health or caregiving responsibilities is required. Previous studies report significant benefits for workers who are provided maternity leave, but the benefits of paid leave for health-related or caregiving needs of older workers is understudied and unappreciated. State policies on paid leave are often underutilized because awareness of leave entitlement is lowest among older adults, some of whom are no longer in the workforce.

Projects are under way to detail the types of work redesign initiatives required for low- and moderate-wage workforces. Organizations' ability and willingness to redesign work practices may be limited, because some work situations require close coordination, and some companies, particularly those requiring less skilled workers, accept a high turnover rate. Documenting the costs and losses of a company's current practices may support the introduction of new practices to retain employees and improve worker health. Initiatives focused on older workers will require understanding of the risks and benefits of targeted rather than universal changes. Whether targeted or universal, a floor for labor standards could enable innovation as organizations consider their culture and needs in developing creative solutions. Workplace interventions require the support of studies with strong causal inferences as well as multi-method research to investigate how organizational changes are implemented in different workplaces.

During the discussion after Session 2, Kelly posited that the difference between production work and care work can explain the reduced effects of intervention in the CNA cohort. The IT professionals' work was performed independently, whereas the CNAs' work was closely coordinated between co-workers. This interdependence limits schedule control. Kelly hopes to customize the intervention to address operational concerns related to the work context.

Discussant Presentation

Lisa Berkman, Harvard University

Health and wellbeing measures, workplace, and the workforce are the three main elements that must be integrated into each study and intervention. The workplace serves as a social determinant of health, and its policies, practices, and culture contribute to growing health inequalities. Changing working conditions place the wellbeing of workers at risk, especially low-

and middle-wage workers. The demography of the workforce is rapidly diversifying and now includes more women, racial and ethnic minorities, immigrants, and older workers than ever before. The framework of health needs to be expanded to include workers' wellbeing.

Research has rapidly accumulated in the fields of wellness and mindfulness in the workplace, but no benefits have been found. The alternative to these programs is complete workplace redesign. A period of great workplace evolution may be the perfect time to enact changes.

Many of the studies discussed during this meeting considered practices to retain older workers in the workforce for longer periods of time. Much of the research focuses on adults employed in their late 50s and 60s and ignores the large and growing proportion of the population who leave the labor force in midlife and are not likely to return. Across all age cohorts, labor force participation steeply declines at about age 55 for both men and women. In addition, Black individuals and those with lower education levels show lower baseline rates of labor participation and higher rates of participation decline than White or more educated workers.

Excluding workers who exit the labor force before age 60 creates a major gap in potential insights, including the limits of working longer to solve the issues posed by an aging population. Working into older ages may not be beneficial for all workers, and promoting longer working lives may have unintended consequences for workers who cannot sustain employment to age 65 or beyond. The potential for trends to work longer to exacerbate social inequalities has been understudied.

Discussion of Session 2

Moderator: Lisa Berkman, Harvard University

Research has shown the many potential benefits of working at older ages. However, the heterogeneity in health, types of jobs, and lifestyle indicates that not every individual will experience those benefits. This heterogeneity requires heterogenous responses to worker desires and outcomes. The policies and practices that promote working at older ages should be viewed at the individual level and not as universal mandates. Discussion on workplace conditions and practices focused on factors discouraging employment, such as substance abuse, chronic pain, disability, depression, mental illness, and lack of paid leave.

Substance Abuse and the Workforce

In many regions of the country, employers cannot fill positions because of the high incidence of substance abuse in the unemployed adult population. Interventions should be considered for these potential workers, including increased medicalized interventions, in these regions and in job sectors that exhibit poor health outcomes. Further, studying the degree to which depression, substance abuse, chronic pain, and disability drive workers out of the workforce as a function of workplace policies may provide powerful insights for structural changes in work practices. However, the data infrastructure required to study these conditions in the context of work does not exist.

Disability in the Workforce

Only one-third of German workers retire at the expected retirement age. Many leave the workforce due to disability. Research has shown that 50 percent of individuals who received early interventional therapy for mental illness (within 2 weeks) recovered and returned to work. In comparison, only 10 percent of individuals who did not receive early therapy recovered. Many individuals believe that work provides the stability and resources needed to combat negative mental health outcomes. However, managers are often more focused on flow productivity than providing working conditions that protect worker mental health. This misalignment between the desires of the company and its workers highlights the need for a multi-systems approach to workplace interventions.

Similar to Germany, many individuals in the United States who are not working at age 50 have disability insurance. Disability insurance benefits are difficult to obtain, and maintaining eligibility requires the individual to stay out of the workforce. The eligibility requirements force individuals to choose between disability insurance and work. More flexible eligibility requirements could induce more employment among those currently receiving disability insurance benefits.

Paid Leave

Small firms do not have the resources of large firms. In Germany, small firms acquire insurance when women take maternity leave to offset the loss of productivity and ensure financial viability. In the United States, all paid-leave laws in the United States follow a similar insurance-based model, requiring both employee and employer contributions. Smaller employers have used this tactic, even before state mandates to do so, as a safety net for continued operations despite a temporary loss of workers. Alternative models to support paid leave across firms of all sizes could improve the wellbeing of working mothers in the near and long term.

Session 3: Work Pathways and Constraints to Working at Older Ages**Pathways between Work and Retirement: The Reciprocal Relationship between Health and Work**

Mo Wang, University of Florida

Transitions between work and retirement follow various pathways. Study of the impact of this transition can reveal associated physical and mental health outcomes. Using self-reported Health and Retirement Study (HRS) data, Wang and Chan (2011) divided retirement outcomes into three potential options, (1) full retirement with no intention of reentering the workforce (43.1 percent of individuals), (2) officially “retired” but still working (14.8 percent), and (3) intermittent transitioning between working and retirement (42.2 percent).

Many individuals enter a new stage of working after retirement (sometimes referred to as bridge employment), shifting from full-time work to part-time work, self-employment, or a career change. Individuals who work after retirement tend to have psychological or financial

incentives to continue working. Again using HRS data, Wang and colleagues explored three theories about retirement and the role of health.

1. Role Theory: Retirement negatively impacts mental health because role exit and transition are stressful.
2. Resource-Based Dynamic Process Theory: Retirement benefits mental health because the individual escapes from a demanding and negative environment.
3. Continuity Theory: Retirement does not impact mental health because the disruption in life pattern is minimal and temporary.

The analysis revealed three distinct subpopulations that reflect each theory. Individuals in the first subpopulation (69-74 percent) maintained their wellbeing after retirement. Individuals in the second subpopulation (4-5 percent) displayed a drastic recovery of wellbeing after retirement. Finally, individuals in the third subpopulation (22-27 percent) displayed an initial decrease in wellbeing after retirement, associated with health decline or marital stress, followed by an increase in psychological wellbeing, associated with adaptation to retirement. Similar results were found in a German study by Pinguart and Schindler. These results imply that retirement does not have a universal effect on workers.

In another study using HRS data, Wang and colleagues sought to understand predictors of working in the same career field or in a different career field following retirement. Education and health positively predicted an individual's tendency to stay in the workforce in either the same or a different career field, while increased stress and age reduced that likelihood. Total wealth was not a significant predictor for working in the same career field but was negatively associated with working in a different career field. Job satisfaction had the opposite effect (positive for same career field, not significant for different career field). These findings were corroborated by data from Zhan and colleagues (2015) in China, which showed that gender, health, economic stress, and financial orientation were associated with a higher likelihood of remaining in the workforce, while age was not. For health outcomes, working after retirement and non-retirement were associated with reduced incidence of major diseases and increased mental health compared to full retirement.

Individuals can transition from work to retirement through multiple pathways, and their outcomes are not universal across a single population. Health and work are reciprocally related in the older population, requiring multiple theoretical perspectives to understand the impacts. Future directions include understanding the underlying beneficial effects of working after retirement, investigating the impact of involuntarily or voluntarily retiring, and producing a dynamic model that describes how financial wellbeing, health, and work may influence each other.

Exploring Cumulative Dis/Advantages among Older Adults: Implications for Health and Work

Ernest Gonzales, New York University

Created under Title V of the Older Americans Act, the federally funded Senior Community Service Employment Program (SCSEP) helps adults ages 55 and over who are unemployed and have a family income of less than 125 percent of the federal poverty level gain employment. Priority is given to enrolling adults who are homeless or at risk of homelessness, have low literacy skills, have a disability, or are veterans. Study of this population provides insight into determinants of work that lead to homelessness and poverty and into SCSEP's impact on these vulnerable populations.

In a set of studies, qualitative interviews of a SCSEP cohort revealed two subpopulations: individuals who endured cumulative disadvantages and individuals who experienced shocks or unplanned health, economic, or social events.^{1,2} The first subpopulation experienced a lifetime of disadvantages that included low education levels, poverty, and poor health while maintaining a strong desire to work. The second subpopulation had high levels of education, good health, consistent employment, abundant resources, and personal drive, but experienced one or more major shocks that led to poverty. Approximately 70 percent of participants reported health improvements after joining the SCSEP, while a small minority reported health decline from age or chronic health conditions. Interviews revealed risk factors, such as unaccommodating work environments and discrimination (perceived and internalized ageism), and protective factors that led to or exacerbated each individual situation. Protective factors existed at the individual, family, institutional, and community levels and included purpose, motivation, work experience, spirituality, safe housing, financial support, training, reliable transportation, and a job that complements physical, cognitive, and social capacities of the worker. Insulating an individual with these resources is critical for achieving success and employment.

Workplace ageism represents another key challenge to the wellbeing of older adults in the workforce.^{3,4} To address a gap in the field, Marchiondo and colleagues developed a reliable measure of age discrimination. The Workplace Age Discrimination Scale (WADS) can be used to investigate how the perception of workplace ageism affects a variety of health outcomes.

¹ Carolan, K., Gonzales, E., Lee, K., and Harootyan, B. (2018). Institutional and individual factors affecting health and employment among low-income women with chronic health conditions. *Journals of Gerontology: Social Sciences*. DOI: 10.1093/geronb/gby149.

² Gonzales, E., Lee, K., and Harootyan, B. (2019). Voices from the field: ecological factors that promote employment and health among low-income older adults with implications for direct social work practice. *Clinical Social Work Journal*. DOI: 10.1007/s10615-019-00719-x.

³ Marchiondo, L., Gonzales, E., and Ran, S. (2015). Development and validation of the Workplace Age Discrimination Scale (WADS). *Journal of Business and Psychology*, 31(4), 493–513. DOI: 10.1007/s10869-015-9425-6.

⁴ Marchiondo, L., Gonzales, E., & Williams, L. (2017). Trajectories of perceived workplace age discrimination and long-term associations with mental, self-rated, and occupational health. *Journal of Gerontology: Social Sciences*, 74(4):655-663. doi.org/10.1093/geronb/gbx095.

Researchers surveyed Amazon Mechanical Turk employees who reported working more than 20 hours each week with the proposed WADS, in addition to demographic, health, and job attitude measures. The younger and older populations recorded the highest WADS scores, inferring higher incidence of perceived age discrimination. Controlling for negative affect, higher WADS scores were associated with decreased job satisfaction, organizational commitment, and mental health, and increased turnover intention. By integrating WADS with HRS data, researchers found that age discrimination was associated with lower job satisfaction, depression, and a higher likelihood of not working past retirement age.

A study using the HRS Leave Behind Questionnaire investigated both the unique and combined effects of four forms of oppression—lifetime discrimination, neighborhood disadvantage, workplace discrimination, and everyday discrimination—and their impact on retirement.⁵ Analysis showed that Black individuals experienced the highest levels of cumulative lifetime discrimination, White individuals reported the highest levels of career and everyday discrimination, and Hispanics reported the highest level of neighborhood disadvantage. White individuals were more likely to report discrimination based on age, Black individuals overwhelmingly reported discrimination based on race, and Hispanic individuals reported significant discrimination based on race and age. In the context of retirement, individuals experiencing discrimination retired on average 2.5 years earlier than individuals with no perceived discrimination. Mental health fully mediated the relationship between everyday discrimination and retirement, whereas mental health partially mediates all of the other relationships.

Because SCSEP is managed by the U.S. Department of Labor, the data collected are focused on labor force attachment and lack psychosocial perspectives. Quantitative data on the connection between health and work, particularly among at-risk populations, are limited and should be improved upon in the future. Other future research goals include improving the HRS through integration of WADS and better attribution of discrimination methods and performing more longitudinal studies with those datasets.

Working at Older Ages: The Role of Constraints and Job Characteristics

Susann Rohwedder, RAND Corporation

Many factors, such as financial status, health, skill level, job availability, and caretaking responsibilities, influence an older worker's preference for either retirement or working and can also constrain their options. For example, an older worker may prefer to continue working to maintain steady income, but the desired type of work may not be available. Because constraints affect worker choices, observed retirement trajectories may not fully reflect

⁵ Gonzales, E., Lee, Y. J., and Marchiondo, L. (2019). Exploring the consequences of major lifetime discrimination, chronic workplace discrimination and neighborhood conditions with health and retirement. *Journal of Applied Gerontology*. DOI: 10.1177/0733464819892847.

preferences, which challenges efforts to measure preferences and perceived constraints and to understand how they influence labor force participation and worker health.

Hudomiet, Hurd, and Rohwedder used the RAND American Life Panel to quantify older workers' preferences and constraints for working at older ages.⁶ Older workers' greatest concerns were health problems and job demands that could impact their ability to work. Few workers were concerned about their employer allowing them to continue work. When rating desirable job features, older workers preferred positions with more flexibility and social support and fewer physical and cognitive demands. If a job provided flexibility, the probability of a worker continuing to work after age 70 was 32 percent; without flexibility, the probability fell to 17 percent. The largest differences in probability of working past age 70 were observed for worker health. An older worker in good health is twice as likely to continue working as is an older worker in poor health. These findings emphasize the importance of promoting health to enable working at older ages. Other job characteristics that showed high causal effects were low job stress and low physical effort. The analysis found heterogeneous treatment effects.

Prior research has shown convincingly that financial incentives strongly impact working at older ages. Parameters of Social Security benefits, which provide longevity insurance, were set at a time when average life expectancy was lower than it is today. The resulting financial imbalance needs to be addressed to keep the program solvent in the long-run. Solutions to this problem are complicated by the fact that gains in life expectancy have been unevenly distributed. Using HRS data, Hudomiet, Hurd, and Rohwedder documented widening inequalities in smoking, subjective survival expectations, and self-reported health among successive cohorts of older individuals with differing levels of lifetime wealth.⁷ Similarly, life expectancy in the two highest lifetime wealth quintiles increased substantially compared to much smaller increases among those in the lowest lifetime wealth quintile. Among women in the lowest quintile, life expectancy was estimated to have decreased. These results suggest that a one-size-fits-all policy to encourage work at older ages would create financial hardship concentrated among those in poor health and with low socioeconomic status.

Future research will benefit from adequate data to identify and quantify the casual effects of job features on work at older ages. Ideally, this data would be obtained in the context of well-designed RCTs, at the firm level. Collaborative research efforts with firms and employers have been scarce, even though both sides stand to benefit from such collaborations. A better understanding of the reasons why firms are reticent to engage in collaborative research might help in framing the research interests and benefits in a way that would be more appealing to firms. For example, researchers' interest in how older workers fare could be reframed as interest in how the effect of workplace policies varies across age groups, to alleviate firms' concerns about being subjected to claims of age discrimination. Firms may be concerned more broadly about legal risks outweighing the benefits of engaging in research interventions. A

⁶ Hudomiet, P., Hurd, M., Parker, A., and Rohwedder, S. (2019). The effects of job characteristics on retirement. NBER working paper w26332, <https://www.nber.org/papers/w26332.pdf>

⁷ Hudomiet, P., Hurd, M., Parker, A., and Rohwedder, S. Trends in health and mortality inequalities in the United States. (2019). MRDRC working paper 2019-401.

possible way to mitigate concerns—that interventions will uncover unfavorable practices of the firm—could be to involve multiple firms simultaneously in the research design to reduce the risk of attributing negative results to a specific firm. While potentially more complicated logistically, it might strengthen the research design by increasing statistical power and generalizability of results beyond a single firm.

Another approach to facilitating work at older ages would be to consider mechanisms to improve the matching of older workers' preferences and job characteristics so that older workers are less likely to quit as some of their work-related preferences change. Renegotiation of preferences throughout the work life is uncommon but offers potential to increase an older worker's time horizon within a position.

Lastly, due to shifting demographics, caregiving responsibilities will become an increasing constraint for workers, making interventions that help workers balance work and caregiving increasingly important going forward.

Public Income Support, Decisions to Work, and Health of Lower-Income Older Adults

Emma Aguila, University of Southern California

The aging of the population internationally has led to a dramatic increase in poverty rates of older adults. The United States is among the countries with the highest poverty rates in older adults, with the poverty rates for Black and Hispanic older adults almost twice that of non-Hispanic whites. To support older adults, policies provide for contributions during working years, such as mandatory contributions to social security and voluntary contributions to individual retirement accounts. A wealth of research has analyzed the effects of these contribution systems on retirement behavior. However, research on noncontributory pensions, also called social pensions and equivalent to the Supplemental Security Income (SSI) program in the United States, is scarce. More than 40 low- and middle-income countries have introduced noncontributory pension programs.

Mexico does not provide universal social security benefits. Workers in Mexico's formal employment sector will receive social security and health care benefits upon retiring. Workers in Mexico's informal employment sector (58 percent of the workforce), which includes workers at noncompliant small firms, self-employed workers who choose not to contribute to social security, and returning migrant workers, will receive noncontributory pension benefits and health care from the government. In the United States, the informal sector has been estimated to compose 11-20 percent of the workforce and consists largely of women, Blacks, and Hispanics.

Noncontributory pension plans have been found to reduce poverty and inequality in many countries, but the evidence on their effects on the health and wellbeing of older adults is less conclusive. Aguila and colleagues conducted a series of RCTs to analyze the difference between monthly or bi-monthly (i.e., every 2 months) noncontributory pension payments in the State of Yucatan, Mexico. Within 6 months of program start, older workers reported improved health outcomes, better cognitive functioning, increased food availability, and increased health care

utilization. Individuals who received monthly payments managed expenditures better and reported a higher reduction in hunger spells, compared to those who received bi-monthly payments. Adults on the bi-monthly payment system were more likely to run out of food, but had higher ownership of durable goods, such as cell phones, suggesting difficulties with saving money throughout the 2 months. Previous studies in the United States confirmed lower-income households' inability to smooth consumption between payments, likely from a lack of formal saving mechanisms and a fear that the money would be stolen. The study also found increased health care utilization and decreased frailty for women with monthly payments compared to bi-monthly payments. The two groups experienced a similar reduction in work for pay.

The benefits of noncontributory pension plans are evident in these short-term studies. Additional study is needed of medium- and long-term health effects and the potential for interventions that provide supplemental income to the most vulnerable older adults prior to retirement. Another area of study is how noncontributory pension plans influence the likelihood of migrant workers returning to Mexico from the United States. Ideally, public policy interventions are tailored to the most vulnerable and culturally diverse older adults in the labor market, considering savings behaviors as well as the design and frequency of supplemental income payments.

The transitions between the formal and informal sectors must be better understood to design effective policies to support the continued health and wellbeing of workers in the informal sector. Ideal interventions include crafting policies to help workers move to the formal sector or, if that is not possible, providing cash transfers (e.g., supplemental income programs or matching contribution schemes) at younger ages to improve wellbeing and promote saving for retirement.

Discussion of Session 3

Moderator: Laura Carstensen, Stanford University

Discussion about work pathways and constraints to working centered on the need for better data about employer or workplace and organizational characteristics, including social welfare programs, measuring stressors and adversity-related questions to understand how adversity is managed and perceived, gender differences, cautions about the use of self-reported data, and potential research collaborations with firms and survey organizations.

Incorporating Employer and Organizational Characteristics

A survey sampling workplaces in Canada over time collected information at the organizational and employee levels, making possible the study of how firm practices influence workers. If this type of survey information were collected and added to the HRS, the influence of organizational practices on a worker's transition into retirement could be more effectively analyzed. Researchers would have to determine whether the HRS is large enough to handle a survey of this magnitude.

All consented HRS participants will have Internal Revenue Service (IRS) records linked to Employer Identification Numbers, which will include information about an individual's

occupation. Christensen (Sloan Foundation) is directing an effort to merge data from the U.S. Census Bureau's Longitudinal Employer-Household Dynamics (LEHD) program with HRS datasets, but this resource will not be available soon. Many efforts to match HRS and organizational data have been attempted but have been abandoned because of many challenges. Administrative matching has become the preferred method. However, the information obtained through this strategy does not contain enough detail on workplace practices and benefits that individuals experience. Further, the HRS may not be the best candidate for organizational mapping because of its low level of Social Security number identification, compared to other resources, such as the Survey of Income and Program Participation (SIPP) at the Census Bureau, which has much higher match rates. While HRS' survey questionnaire is of much higher quality, SIPP has greater breadth of information, about workplace factors and practices.

In Germany, randomly selected firms are interviewed annually with the Linked Personal Panel (LPP), which includes questions crafted by a scientific advisory panel. The collected surveys are then linked to Social Security information within the database. Preliminary analysis has found only small effect sizes within these data, which could be mitigated with changes to the interview questions. If undertaken in the United States, these efforts may not produce similar effect sizes because the social and policy climates of both countries are very different. Workers in the United States obtain the majority of social welfare programs through work, and therefore the health, policy, and employer connection may be much stronger than in Germany and create larger effect sizes in collected data.

A mandatory establishment survey may be needed to understand the system as a whole and would complement the data already collected on individuals and labor market outcomes. Implementing a more expansive survey may require gaining buy-in at the state and federal government levels. Until then, many surveys in the United States include questions about workplace benefits across industries, but these surveys are not longitudinal. In addition, multiple HRS comparative studies across countries are connected within the Gateway Program, a network to enhance comparability and produce contextual data on a variety of topics, such as long-term care and social pension practices.

Measuring Stressors and Adversity

In occupational health research, stressors are considered either a hindrance stressor or a challenging stressor. As examples, Lachman's research suggests that when retirement removes a resource (e.g., cognitive stimulation), cognitive functioning is more likely to decline; Rohwedder's research revealed that older workers desired work that is less cognitively and physically demanding. Viewing cognitive demands as a hindrance stressor would explain why some older workers prefer less cognitively stimulating job demands to continue working, and the converse can be explained through the context of challenging stressors.

The addition of adversity-related questions to the HRS would improve researchers' ability to understand how adversity is managed and perceived at the individual level.

Gender Differences in the Context of Work and Retirement

Researchers have found it difficult to dissect gender differences within the SCSEP population. However, men reported higher rates of social isolation, and women were greatly influenced by their family and caregiving responsibilities to either maintain employment to support their family or to not enter the formal workforce because caregiving responsibilities were too constraining. With the WADS study, gender differences did not impact age discrimination outcomes. In another study not presented here, gender differences greatly predicted outcomes in cognitive complexity at work. Gender differences in work and retirement outcomes for older adults also extend to desired socioeconomic values. In the China-based study described by Wang, communion-striving orientation more likely influenced women to work after retirement and status-striving orientation influenced men.

Self-Reported Data

Researchers are always cautious about the accuracy of self-reported data. When applicable, self-reported variables can be reweighted and combined with other data, such as health condition outcomes from Medicare claims records. While each data source (self-reported or administrative) has unique benefits and challenges, they should be utilized as complements to create the most effective, aggregate dataset. Nevertheless, much of the subjective, self-reported data presented here accurately predict health and mortality outcomes and should be valued for their ability to provide critical insights. Self-reported health and cause of death could be ascertained by the actual cause of death information.

Research Collaborations

The firm-based data that could elucidate the effects of workplace practices on the health and wellbeing of older workers can be difficult to obtain. In response to the challenges that researchers—especially junior researchers—face in forging partnerships with firms for research purposes, NIA offers an [R25 grant](#) to help train researchers on how to collaborate with private-sector partners to conduct research.

Researchers have also collaborated with organizations, such as Gallup and the Organization for Economic Cooperation and Development, that are collecting very impactful data on workplace practices through effective survey techniques. These collaborations offer opportunities to learn the design behind these high-quality studies and to find new ways to use and interpret the resulting data.

Session 4: Macroeconomic Change and Employment at Older Ages**Employment at Older Ages: Retirement Policy, Business Cycles, and Demographic Change**

Richard W. Johnson, Urban Institute

In the past 25 years, the percentage of older adults in the workforce population has doubled, from 12 percent to 24 percent, reflecting the rapidly aging population and the increasing trend of adults over age 60 to stay in the workforce after reaching retirement eligibility.

Although older workers are working more on average, many are forced to retire before they are ready, a phenomenon called involuntary separation. Johnson and Gosselin found that in a cohort of employed individuals ages 51-54 only 47 percent were working full-time with 5 or more years at their current position. Of these, more than half eventually experienced involuntary employer-related job separation, from job loss or business closing, worsening workplace conditions, or unexpected retirement. Separation was observed across genders, races and ethnicities, education levels, geographical region, and industry of employment. Further, overall only 10 percent of older workers experienced a full recovery of earnings, and the percentage was larger for Hispanics (19 percent) and individuals with less than a high school education (14 percent), perhaps because they started with lower earnings. The involuntary separations coincided with dramatic reductions in household income across all education levels. Nearly one-third of older workers experienced multiple such separations.

Through a longitudinal study with data from the Survey of Income and Program Participation (SIPP), Johnson and Smith sought to understand the consequences of job loss for older adults, looking at involuntary separations before and after the Great Recession. As expected, the number of long-term unemployment (i.e., longer than 6 months) cases increased following the Great Recession as did the length of unemployment. If re-employed, older workers experienced significantly larger earnings losses compared to younger workers, and the earnings decline was even greater following the recession. Older adults may access their Social Security benefits at age 62 to lessen the wage loss, which may explain the lower poverty rates for unemployed workers ages 62 and older compared to other age groups.

Older workers experience issues with staying in their jobs or finding new jobs. Age discrimination may play a role, with increasing numbers of older workers seeing or experiencing ageism, particularly those who are less educated or of color. Surveys of employers reported beliefs that older workers cost more because of seniority pay scales and high health care costs, do not accrue cutting-edge skills, specifically in technology, and will not stay at the job long enough to justify recruiting and training costs. These attitudes may explain employers' reluctance to hire older workers.

Health differences by socioeconomic status could accentuate inequality at older ages. Using HRS data, Johnson and colleagues found that the percentage of men and women with work limitations increased between 1996 and 2014, with greater increases for those who never attended college. Employment and household income of individuals ages 62-64 increased during that time period, but only for those without work limitations. The income shortfall for older adults with health problems persisted for at least 10 years but diminished over time.

Policies that promote workforce development for older workers, diminish age discrimination, and reduce employment costs for older workers could overcome the issues uncovered through this research. Solutions include reducing Social Security and Medicare payroll taxes for older adults and making Medicare the primary payer for employed beneficiaries to both reduce the costs of employing and increase the earnings of older workers. Simulations of tax reform showed a modest increase, up to 13 percent, in older worker employment rates, which may

imply greater benefits are to be found. The field must better understand both the demand side of the labor market and which older groups are most vulnerable to establish interventions and policies to protect older adults as they become unemployed.

Changes in Occupation Structure and Opportunities for Older Workers

Gary Burtless, Brookings Institution

For many years, the U.S. Bureau of Labor Statistics (BLS) has studied the factors, such as specific skills or education, that are required for a plethora of occupations in many industries, as well as how the numbers of available positions expand or shrink over time. Both the BLS- and labor economist-based analyses have found an increase in the number of occupations that require at least a college degree and a decrease in low- and middle-skilled occupations that involve repetitive tasks, with the exception of some low-skill occupations that require in-person services.

The skill distribution of job requirements has shifted over time. Of note, an analysis of job postings suggests that higher skill levels and education are not always needed to fill a job with a qualified employee. During times of job market contraction, postings tend to specify a bachelor's degree as a requirement; however, in times of job market expansion (when fewer applicants are available), postings for the same job lower the requirement to an associate's degree, with no impact on job performance. Requiring higher degrees for certain jobs may be more of a preference than a necessity.

The time period 1980-2005 saw dramatic increases in the numbers of workers needed in high-skill occupations and decreases in the numbers of middle-skill occupations because of increased automation and international outsourcing. Autor assessed jobs changes by decade (the four decades from 1970 to 2016) and found that low-skill jobs reversed a decreasing or flat trend during the fourth decade, middle-skill jobs decreased in every decade, and high-skill jobs expanded in every decade. The growing aging population may partially explain these changes. An older population may require more in-person low-skill workers to perform routine tasks, such as lawn maintenance or health care aides, as well as high-skill workers, such as specialist physicians.

In the long term, the availability of jobs for older workers will depend more on the business cycle factors than on job skill requirements. This reflects the idea that the skills necessary to perform the majority of jobs are malleable. Employers can modify job requirements or institute training to satisfy the requirements of a given occupation with the resources of available applicants. This model of job malleability may cover enough occupations in the United States to accommodate older workers who choose to work despite their eligibility for retirement benefits.

Concerns for older workers' job opportunities and evolving skill requirements within occupations are valid. However, these concerns are equally valid for all other age groups. The participation and employment rates of older populations have increased considerably in recent years—even during and after the Great Recession—compared with rates in younger age

groups. Further, workers ages 60 and older were increasingly engaged in full-time rather than part-time work. The contrasting trends between older and younger workers can be explained by the fact that a significant number of older workers are expected to leave their occupations at a consistent rate, either through retirement or involuntary separation, when the economy is healthy. In the Great Recession and its immediate aftermath, voluntary job leaving rates for older workers declined significantly, particularly among workers ages 67-71. The decline in voluntary job exits offset the fact that the involuntary layoff rate increased. This pattern suggests many older workers chose to spend a larger portion of their older years in the workforce, not in retirement.

Before, during, and after the Great Recession, older workers experienced considerable difficulty finding re-employment if they lost their job or if they needed a less demanding job. In some measure, this is because of age discrimination. Employers tend to hire applicants under age 45 compared with applicants over age 50, even if the younger and the older applicant present identical job qualifications. Many employers are aware of the wider social and economic benefits of hiring older workers, yet believe that higher costs for retraining or health care for older workers may make an older worker more costly than a younger one. In addition, the perception that an older worker's productivity may be lower than a younger worker's or may begin to decline sooner can bias some employers. Providing concrete evidence of the productivity contributions of older workers may reduce these perceptions and help older workers who want to work.

Digital Work in Innovation's Supply Chains

Lilly Irani, University of California, San Diego

Amazon Mechanical Turk (AMT) is a cloud service that uses humans to provide computing services that are not amenable to AI automation. Programmers list tasks on AMT with a set wage, and workers can process these tasks from all over the world, although approximately 85 percent of AMT workers are from the United States. The average age of workers in this job pool is 35 years, much lower than the U.S. workforce.

Surveys report that most AMT workers use AMT to complement wages from other jobs and for schedule flexibility. In reality, many workers feel pressured to be available to claim the best and highest-paying jobs as they are posted, which limits flexibility for caregiving responsibilities. Further, when posed with creating a hypothetical "Turker Bill of Rights," respondents identified arbitrary rejections of task performance, not receiving wages quickly, unresponsive employers and Amazon staff, and a lack of a minimum wage as conditions needing rectification. Workers would like these issues to be acknowledged and addressed, while employers believe mediating these problems is unscalable because one employer may be responsible for more than 5,000 workers. Essentially, AMT converts workers into scalable infrastructure and induces employers to view themselves as programmers instead of managers, and workers as code. AMT work is perceived as menial and primitive although 58 percent of AMT workers have a college degree, making this population more educated than the general U.S. workforce.

AMT is one example of how outsourcing and branding increases have corresponded to naturalization of job insecurity, arbitration of global financial flows, and reinvention of the self at the individual level to ensure competitiveness within innovative entrepreneurial logic systems. Reinventing the self in terms of personal brands and uniqueness is not a feature to which older workers are accustomed and may cause older workers to be ill-fitted for the future digital workforce.

In response to many of these worker-reported challenges, a platform called Turkopticon was produced to allow workers to review and discuss specific employers in AMT with other workers. AMT workers have also produced online forums to disseminate information for new employees, discuss challenging employers, and increase skill development. These resources can be characterized as a form of invisible labor because they aid in efficiency but remain external to the core features available from the AMT organization.

Worker health can be negatively impacted in these “invisible” work environments because workers are under pressure to perform tasks on a consistent basis and not miss a valuable task posting. The structure of the gig economy, including the uncertainty it creates about tasks and payment, requires workers to draw on family and community resources. More thought needs to be given to the costs and benefits of this structure.

Discussion of Session 4

Moderator: Lisa Berkman, Harvard University

Approximately 22 percent of men without a high school diploma start to receive Social Security Disability Insurance when they are in their 50s. Although inequalities in labor force participation for workers with lower education levels are becoming less common over time, this population requires increased social protections to improve health and wellbeing where the workplace cannot. For example, the Supplemental Security Income program was initiated as a negative income tax for the disabled and older population; its means testing has not been updated and indexed for price levels in approximately 50 years. Indexing the asset test would better represent the older population and make the program more available and affordable for the populations it seeks to help.

Older workers sometimes have experienced difficulty finding employment even when employers are actively searching. As a result, many accept work for which they are overqualified to perform. In many cases, the ability to find a job that is a good fit in terms of skill and salary requirements is determined by the timing of the job market. Further, the high prevalence of involuntary separations creates a system where high job insecurity is the norm and workers are more willing to work longer and endure more work-related stress in attempt to manage their job security. Regardless of the type of involuntary separation or the worker’s ability to find new work, the worker’s health will be greatly impacted.

Meeting Wrap-Up and Future Directions Discussion

Moderators: Linda Berkman, Harvard University, and Laura Carstensen, Stanford University

Meeting participants focused on the following topics during the final discussion: collaboration, interventions, data needs, and opportunities for international work.

Collaboration

Potential collaborators include companies with cross-state and national presence (such as Mercer, which has initiated a project on older workers) and state and city governments, whose goals for the health of their employees and constituents overlap. The most difficult part of developing partnerships is convincing stakeholders to listen to the research pitch. After that, multiple meetings are usually required to determine whether synergy exists between the researcher and the organization. Collaborations could be designated as a research partnership or a consulting engagement. A hybrid model of the two types of collaboration is possible and may be a way to broaden partnerships, with science and academic research at the forefront.

Meeting participants suggested the following avenues to increase opportunities for collaboration:

- Leverage training grants to train junior researchers on strategies to collaborate with companies and gain access to important datasets.
- Host a forum with senior managers of large consulting companies to learn about the key issues regarding perceptions of aging in the workplace. The agenda could include separate meetings for the public and private sectors as well as international corporations.
- Create a hypothetical marketplace where employers post needed services and researchers provide solutions. Many multi-level workplace questions are complicated and cannot be addressed by the RCT model. With this structure, stakeholders can gain knowledge about change projects being implemented and consider qualitative and quantitative models to improve them.

In addition, participants suggested the following stakeholders as potential collaborators: U.S. Department of Labor, Mercer, The Port Foundation, Aspen Foundation, and Sloan.

Interventions: Practices, Policies, and Scalability

Participants agreed on the need to encourage the study of work-related mechanisms to improve wellbeing at the individual, institutional, state, and national levels. Discussion centered on a mechanism-focused approach to behavioral intervention development, with explicit testing of hypotheses about how and why an intervention achieves its effects and appropriate measures of intervention features, mediating processes, and relevant outcomes. These mediator(s) may reside at any level of analysis—from the individual to the institutional. Appropriate measures of exposures, mediators, and outcomes allows for testing of causal hypotheses and aids in refinement of interventions. Researchers are also encouraged to use the

[NIH Stage Model](#) to assess their findings and potential interventions for scalability and deliverability.

It may be possible to develop a menu of possible interventions, from which companies can choose and the researchers tailor to meet the organization's needs and priorities.

Meeting participants provided the following comments about interventions:

- One study investigated optional retirement policies in companies that change policies over time. This situation may provide a natural experiment for study of how policy changes affect workers and retirement.
- Existing data infer that the most vulnerable and at-risk populations have the largest potential for growth and improvement after intervention. Study designs have omitted exploration of whether these populations have a more innate potential for improvement and/or more resiliency. Researchers must anticipate and use outcome heterogeneity to shape study design.
- Researchers should use multiple models to design studies and interventions. A network that enables researchers to share and provide input on study design ideas could advance the field.
- The public might not be fully aware of the negative outcomes associated with retirement. An intervention that shows how resources must be maintained after workforce exit is critical to foster cognitive and physical wellbeing.

Data Needs

One NIA occupational cohort composed of workers at Alcoa, a large and geographically diverse manufacturing company, has been matched to Social Security information and will be available for research use soon. Other resources, such as the HRS, HRS sister studies around the world,⁸ Panel Study of Income Dynamics, and BLS data, capture work histories and are available for use now. Many of these resources have data linkage with the Social Security Administration, Centers for Medicare & Medicaid Services (CMS), and IRS, but linkage to organizational firm data requires improvement. Many federal partnerships rely on receiving participant consent forms, a process that is complicated by federal regulations about consent form protocol.

Germany enforces data usage and security through the Personal Data Security Act. Every company in Germany must perform health risk and psychological assessments of its workers, and Fischer's team has been tasked with producing a questionnaire, with the hope that its use will become more widespread worldwide to create a massive database of health and psychological worker data.

Participants suggested circulation of a document to flesh out measures of outcomes and exposure as an area worthy of further exploration.

⁸ See Gateway to Global Aging data at <https://g2aging.org/>.

Opportunities for International Work

The design of interventions for the U.S. workforce could be informed by study of workplace practices and worker health, wellbeing, and job satisfaction in other countries. Comparative datasets that may be useful for future research include the following:

- HRS and global HRS studies
- Gallup
- Eurostar
- Panel Study of Income Dynamics and similar international family surveys
- National Longitudinal Surveys of Youth, includes a retirement module
- Luxembourg Income Dynamics Study
- European Working Conditions Survey
- American Working Conditions Survey (from RAND)

Many of the mentioned comparative studies include very clear measures of wellbeing, but they have an incomplete understanding of the nomenclature of the world of work. As an example, the Medical Expenditure Panel Study does not reliably distinguish between self-employed workers and people working for someone else, which is important for distinguishing the source of health insurance. Harmonization among comparative research studies will help to mitigate the challenges faced when work language is not clear.

Finally, during the discussion, participants recommended adding volunteering and worker obligations to society as potential research topics.

Final Thoughts

Berkman circulated a notes document to all participants for input that is summarized in the table below.

Work Features	Interventions	Demographics	Challenges to Methods	Outcomes
<ul style="list-style-type: none"> • Support • Collaboration • Resources • Complexity • Stimulation • Learning Opportunities • Perceived Value • Dignity • Flexibility • Novelty • Mixed-Age Teams • Physical Demands • Pace • Intensity • Telecommute Availability • Work-Time Quality • Physical Environment • Meaning • Wage • Prospects • Autonomy • Employer Representation • Special Positions • Contract Work • Always “On” Mentality • Partial Retirement • Job Security • Supervisor Goals 	<ul style="list-style-type: none"> • Job Crafting • Mixed-Age Teams • Knowledge Transfer • Collective Crafting/Social Change • Workforce Investments • Medicare and Social Security Tax Reform • Expand Earned Income Tax Credits to Older Workers 	<ul style="list-style-type: none"> • Low SES Workers • Older workers emotional and cognitive contributions • Middle-age cohorts are less healthy than earlier cohorts at same age • Unpaid caregiving • Workers managing serious health conditions 	<ul style="list-style-type: none"> • Evidence-based • RCT • Lab • Partner-people analytics • O*NET 	<ul style="list-style-type: none"> • Purpose • Biomarkers • Behaviors • Preventative Visits • Hospitalizations • Job Performance • Extension of Work Life • Turnover Interval • Burnout • Engagement • Physical Health • Cognitive Function • Psychological Wellbeing • Generativity • Inter-generational contact • Knowledge Management • Emotional Exhaustion • Hope and Optimism • Task Performance

Appendix 1: Agenda

Planning Meeting on Work, The Workplace, and Aging

The National Academies of Science, Engineering, and Medicine
The Keck Center, 500 5th Street NW, Room K101

September 5-6, 2019

Day One: September 5, 2019

9:00 am **Welcome and Introductions**
Lisa Berkman, Harvard University
Laura Carstensen, Stanford University

9:30 am **Session 1: The Psychology of Work**
This session will set the context for the subsequent sessions by defining “work” in an expansive manner that encompasses unpaid work, such as volunteering and engagement in civic organizations. It will focus on psychological role of work for older workers, the ways in which their presence provides emotional stability and support within the workplace, and the effects of these factors on mental and physical health of aging workers. In addition, the session will address the ways in which socioeconomic inequality affects the relationship between work and health among older workers.

Presenters:

- Eric Kim, Harvard University
- Margie Lachman, Brandeis University
- Cort W. Rudolph, Saint Louis University

Suggested Readings:

- ✓ Kim, Eric S.; Delaney, Scott W.; Kubzansky, Laura D. forthcoming. Sense of purpose in life and cardiovascular disease: Underlying mechanisms and future directions.
- ✓ Hamm, Jeremy M.; Heckhausen, Jutta; Shane, Jacob; Infurna, Frank J., Lachman, Margie E. 2019. Engagement with six major life domains during the transition to retirement: Stability and change for better or worse. *Psychology and Aging*, 34, 3, pp. 441-456.
- ✓ Rudolph, Cort W.; Kooji, Dorian T. A. M.; Rauvola, Rachel S.; Zacher, Hannes. 2018. Occupational future time perspective: A meta-analysis of antecedents and outcomes. *Journal of Organizational Behavior*, 39, 2, pp. 229-248.

Additional Optional Readings:

- ✓ Grywacz, Joseph; Segel-Karpas, Dikla; Lachman, Margie E. 2016. Workplace Exposures and Cognitive Function During Adulthood: Evidence from National Survey of Midlife Development and the O*NET. *Journal of Occupational and Environmental Medicine*, 85, 6, pp. 535-541.
- ✓ Segel-Karpas, Dikla; Ayalon, Liat; Lachman, Margie E. 2018. Retirement and depressive symptoms: A 10-year cross-lagged analysis. *Psychiatry Research*, pp. 565-570.

12:30 pm**Break****1:30 pm****Session 2: Workplace Conditions and Practices**

This session will focus on workplace characteristics, policies, and practices that affect worker physical and mental health and that can enable or deter employment among older workers. It will consider the ways in which existing workplace practices can be modified to better address the specific needs of older workers and recognize their contributions to the workplace.

Presenters:

- Nicole Maestas, Harvard University
- Joachim Fischer, University of Heidelberg
- Peter Berg, Michigan State University
- Erin Kelly, Massachusetts Institute of Technology

Suggested Readings:

- ✓ Maestas, Nicole; Mullen, Kathleen J.; Powell, David; von Wachter, Till; Wenger, Jeffrey B. 2017. The American Working Conditions Survey finds that more than half of retirees would return to work. Santa Monica: RAND Corporation.
- ✓ Maestas, Nicole; Jetsupphasuk, Michael. Forthcoming. What do older workers want? In Bloom, David E. (ed), *Live Long and Prosper? The Economics of Aging Populations* (pp. 25-31). **(Do not cite or distribute without permission from the author)**
- ✓ Schouten, Lianne S.; Bültmann, Ute; Heymans, Martijn; Joling, Catelijine I.; Twisk, Jos W.R.; Roelen, Comé A. M. 2015. Shortened version of the work ability index to identify workers at risk of long-term sickness absence. *European Journal of Public Health*, 26, 2, pp. 301-305.
- ✓ Song, Zirui. 2019. Effect of a Workplace Wellness Program on Employee Health and Economic Outcomes: A Randomized Clinical

Trial. *Journal of the America Medical Association*, 312, 15, pp. 1491-1501.

- ✓ Berg, Peter; Piszczek, Matt. 2019. Workforce aging and human capital flows in organizations: A comparative study of Germany and the United States. Under review. **(Do not cite or distribute without permission from the author).**

Additional Optional Readings:

- ✓ Maestas, Nicole; Mullen, Kathleen J.; Powell, David; von Wachter, Till; Wenger, Jeffrey B. 2017. How Americans perceive the workplace: Results from the American Working Conditions Survey. Santa Monica: RAND Corporation.
- ✓ Berg, Peter; Piszczek, Matt. 2018. Retirement proof your company. *Harvard Business Review*, November 14, 2018.
- ✓ Ollier-Malaterre, Ariane; McNamera, Tay; Matz-Costa, Christina; Pitt-Catsouphes, Marcie; Valcour, Monique. 2013. Looking up to regulations, out at peers or down at the bottom line: How institutional logics affect the prevalence of age-related HR practices. *Human Relations*, 66, 10, pp. 1373-1395.

4:15 pm Day One Wrap-Up

4:30 pm Adjournment of Day One

Day 2: September 6, 2019

8:30 am Session 3: Work Pathways and Constraints to Working at Older Ages

This session will focus on heterogeneity among older workers in their pathways between work and retirement, including factors that constrain the ability to work and the type of work activities in which older workers are engaged. It will address the voluntariness of work at older ages—that is, whether older workers participate in the workforce because they bring experience and special skills and want to keep working, or out of necessity due to financial insecurity-- and economic and social inequalities that generate and are perpetuated by these decisions. Presenters will examine factors such as health and family responsibilities that constrain work behaviors and how public policies address these constraints.

Presenters:

- Mo Wang, University of Florida
- Ernest Gonzales, New York University

- Susann Rohwedder, RAND Corporation
- Emma Aguila, University of Southern California

Suggested Readings:

- ✓ Wang, Mo. 2007. Profiling Retirees in the Retirement Transition and Adjustment Process: Examining the Longitudinal Change Patterns of Retirees' Psychological Wellbeing. *Journal of Applied Psychology*, 92, 2, pp. 455-474.
- ✓ Marchiondo, Lisa A.; Gonzales, Ernest; Williams, Larry J. 2017. Trajectories of perceived workplace age discrimination and long-term associations with mental, self-rated, and occupational health. *Journals of Gerontology: Series B*, 74, 4, pp. 655-663.
- ✓ Hudomiet, Péter; Hurd, Michael D.; Parker, Andrew M.; Rohwedder, Susann. 2019. The effects of job characteristics on retirement. RAND Working Papers. **(Do not cite or distribute without permission from the author).**
- ✓ Aguila, Emma; López-Ortega, Mariana; Gutiérrez Robledo, Luis Miguel. 2018. Non-contributory pension programs and frailty of older adults: Evidence from Mexico. *PLoS ONE*, 13, 11, e0206792.

Additional Optional Readings:

- ✓ Wang, Mo; Zhan, Yujie; Liu, Songqi; Shultz, Kenneth S. 2008. Antecedents of bridge employment: A longitudinal investigation. *Journal of Applied Psychology*, 93, 4, pp. 818-830.
- ✓ Zhan, Yujie; Wang, Mo; Liu, Songqi, Shultz, Kenneth S. 2009. Bridge employment and retirees' health: A longitudinal investigation. *Journal of Occupational Health Psychology*, 14, 4, pp. 374-389.
- ✓ Marchiondo, Lisa A.; Gonzales, Ernest; Ran, Shan. 2016. Development and validation of the workplace age discrimination scale. *Journal of Business and Psychology*, 31, 4, pp. 493-513.
- ✓ Aguila, Emma; Kapteyn, Arie; Smith, James P. 2015. Effects of income supplementation on health of the poor elderly: The case of Mexico. *PNAS*, 112, 1, pp. 70-75.
- ✓ Aguila, Emma; Vega, Alma. 2017. Social Security contributions and return migration among older male Mexican immigrants. *The Gerontologist*, 57, 3, pp. 563-574.

11:30 am

Break

12:30 pm

Session 4: Macroeconomic Change and Employment at Older Ages

This session will focus on how changes in the broader economic environment may affect the relationship between older workers and the types of employment in which they engage. Key issues for discussion

include: demographic changes, such as the growing portion of older workers in the workforce, reflecting both supply and demand factors; increased disability rates among older workers with a high school degree or less; and the impact of technology (e.g., the emergence of web platform mediated work arrangements) and changing employee and employer relationships on the prospects and wellbeing of older workers. The session will address the differential impact that economic growth and recessions, as well as changes in the types of jobs that are available, have on older workers' decisions to remain in or leave the labor force.

Presenters:

- Richard W. Johnson, Urban Institute
- Gary Burtless, Brookings Institution
- Lilly Irani, University of California, San Diego

Suggested Readings:

- ✓ Johnson, Richard W. 2018. Is it time to raise the Social Security retirement age? Urban Institute Research Report. Washington, D.C.: Urban Institute.
- ✓ Burtless, Gary. 2013. Who is delaying retirement?: Analyzing the increase in employment among older workers. In Aaron, Henry T. and Burtless, Gary (eds.) Closing the deficit: How much can later retirement help? (pp. 11-35). Washington, D.C.: Brookings Institution Press.
- ✓ Cheremukhin, Anton A. 2014. Middle-skill jobs lost in U.S. labor market polarization. *Economic Letter, Federal Reserve Bank of Dallas*, 9, 5, pp. 1-4.
- ✓ Burtless, Gary. 2019. Changes in occupation structure and opportunities for older workers.
- ✓ Gershon, Illana; Berlatsky, Noah. 2017. Op-Ed: Are you too old to find work? *Los Angeles Times*, September 18, 2017.
- ✓ Bruder, Jessica, 2017. Meet the CamperForce, Amazon's nomadic retiree army. *Wired Magazine*, 25, 10, (online: September 14, 2017).
- ✓ Irani, Lilly. 2015. Difference and dependence among digital workers: The case of Amazon Mechanical Turk. *The South Atlantic Quarterly*, 114, 1, pp. 225-234.

Additional Optional Readings:

- ✓ Johnson, Richard W.; Gosselin, Peter. 2018. How secure is employment at older ages? Urban Institute Research Report. Washington, D.C.: Urban Institute.

- ✓ Irani, Lilly. 2019. Learning to add value at the studio. In Irani, Lilly. *Chasing Innovation*. (pp. 82-108). Princeton: Princeton University Press. (Suggested reading: pages 96-104).

3:00 pm

Meeting Wrap-Up and Future Step

This session will wrap-up the meeting, providing an overview of key findings and next steps. Participants will discuss future research and data needs. Attendees and sponsors will have the opportunity to provide feedback and discuss the steps they will take to move forward on the issues raised during the meeting.

4:00 pm

Adjournment of Day Two

Appendix 2: Participants

Planning Meeting on Work, The Workplace, and Aging

The National Academies of Science, Engineering, and Medicine
The Keck Center, 500 5th Street NW, Room K101

September 5-6, 2019

Speakers and Moderators

Emma Aguila, University of Southern California
Peter Berg, Michigan State University
Lisa Berkman, Harvard University
Gary Burtless, Brookings Institution
Laura Carstensen, Stanford University
Joachim Fischer, University of Heidelberg
Ernest Gonzales, New York University
Lilly Irani, University of California, San Diego
Richard W. Johnson, Urban Institute
Erin Kelly, Massachusetts Institute of Technology
Eric Kim, Harvard University
Margie Lachman, Brandeis University
Nicole Maestas, Harvard University
Susann Rohwedder, RAND Corporation
Cort W. Rudolph, Saint Louis University
Mo Wang, University of Florida

Attendees

Laith Alattar, Social Security Administration
Ramsey Alwin, American Association of Retired Persons
Alison Aughinbaugh, U.S. Bureau of Labor Statistics
Katherine Bent, Social Security Administration
Kathleen Christensen, Alfred P. Sloan Foundation
Lynn Fisher, Social Security Administration
Nadia Karamcheva, Congressional Budget Office
Michael Schoenbaum, National Institute of Mental Health, National Institutes of Health
Hugette Sun, U.S. Bureau of Labor Statistics
Robert Wallace, The University of Iowa

National Institute on Aging, Division of Behavioral and Social Research

Audie Atienza, Senior Behavioral Scientist
Frank Bandiera, Health Science Administrator
Prisca Fall, Health Specialist
Elena Fazio, Health Scientist Administrator

Jonathan King, Program Director

Laura Major, Health Specialist

Lisbeth Nielsen, Chief, Individual Behavioral Processes Branch

Georgeanne Patmios, Program Official

John Phillips, Chief, Population and Social Processes Branch

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Brian Harris-Kojetin, Director, CNSTAT

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Malay Majmundar, Director, CPOP and Senior program Officer, CNSTAT