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Acknowledgements

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Identifying and Tackling Grand Challenges for Social Work

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Introduction and Overview

On August 8-10, 2012, a small group of social work faculty, deans, and leaders of national social work organizations gathered together at the IslandWood Conference Center on Bainbridge Island, Washington, to grapple with social work's role in shaping 21st century society. The first day of the IslandWood roundtable focused on the Science of Social Work. The second day, conceptualized and led by deans and faculty from the University of Washington, moved from a general examination of social work science to a proposal: that of producing a set of grand challenges to galvanize the field of social work (Uehara, 2012). "Grand Challenges" are highly ambitious yet achievable goals for society that mobilize a profession, capture the public's imagination, and require innovation and breakthroughs in science, technology and practice to accomplish (Kalil, 2012; Uehara, Flynn, Fong, & Brekke, 2013).

Roundtable presenters reviewed the concept and history of Grand Challenges and discussed possible approaches, benefits, and risks involved in the development of Grand Challenges for Social Work. A recent case exemplar—the National Academy of Engineering's Grand Challenges initiative—was presented and reviewed. Historical examples of social work's "grand accomplishments" were offered, providing evidence of Social Work's capacity to bring science and know-how to bear on tackling seemingly intractable societal challenges. Presenters then described societal problem areas that might lend themselves to the development of grand challenges. The intent was not to build a list of specific grand challenges, but rather to explore the idea's potential to greatly benefit society and propel the field forward.

By the end of the day, participants were in agreement that the creation of a grand challenges for social work initiative might both galvanize the profession and create transdisciplinary communities of innovators who work together on to accomplish shared and compelling societal goals. Grand challenges could capture the interest of the general public while advancing the science and practice of social work. Participants acknowledged that adopting a grand challenges approach has risks: it places demands on individuals and organizations – and success is not guaranteed. Yet the potential benefits may greatly outweigh the risks. The history of social work offers many examples of great achievements, such as the Children's Bureau infant mortality campaign and the Program of Assertive Community Treatment, which can serve as models for addressing contemporary grand challenges. If the practical issues involved in developing grand challenges could be overcome, the approach would offer social work a tremendous opportunity to enhance social justice and individual well-being.

Rick Barth, president of the American Academy of Social Work and Social Welfare, described the Academy as an appropriate and logical lead agency for a national Grand Challenges for Social Work initiative, and agreed to explore the proposal with the Academy's board.

The Grand Challenges Approach—Edwina (Eddie) Uehara, Presenter

In 1900 the German mathematician David Hilbert addressed the International Congress of Mathematicians in Paris and described a list of unsolved problems in mathematics. These problems occupied the efforts of generations of mathematicians, observed Eddie Uehara from the University of Washington School of Social Work. Since then, many groups have used a grand challenges approach to focus, galvanize, and inspire their respective fields or scientific disciplines.

Uehara defined four dimensions in which grand challenges approaches have differed: sponsorship or auspice, definition, delineation process, and strategic platform or programs to meet the challenges. Grand challenges have been developed under the auspices of many kinds of organizations, including academic organizations such as the National Academy of Engineering, government agencies such as the U.S. Agency for International Development, private foundations such as the Bill and Melinda Gates Foundation, and partnerships such as Grand Challenges Canada, which combines a nonprofit organization and a government agency. These organizations have taken different approaches to delineating grand challenges. Some relied on small expert groups to draft the grand challenges list, with review, input, and dissemination involving a broader constituency. Other organizations have issued public calls for input, after which a small working group winnowed and prioritized the list.

Definitions of grand challenges vary by the field under study and the goals of the organization establishing the challenges. For example, the U.S. Office of Science and Technology Policy (1987) described a grand challenge in the context of high-performance computing and communications as "a fundamental problem in science or engineering, with broad applications, whose solution would be enabled by the application of high performance computing resources that could become available in the near future" (p. 3). Grand Challenges Canada (2011), in the context of global development, described grand challenges as "one or more specific critical barrier(s) that, if removed, would help solve an important health problem in the developing world with a high likelihood of global impact through widespread implementation." However, Uehara suggested, while the term has been defined and applied in various ways, most conceptualizations of Grand Challenges tend to stress:

(1) a delimited set (typically between 12-17) of very high-level goals or aspirations,
(2) reflecting broad, integrative problems, with deeply important societal implications,
(3) the solutions to which are "right over the horizon"—that is, the science, technology, and know how needed to address the challenges are imaginable but the path to solution is not yet clear.

It is key that grand challenges be crafted according to the problem "morphology" described above—i.e., widely applicable challenges for which scientifically sound solutions are imaginable but not quite at hand (this makes it a "challenge"), with deep societal importance (this makes the challenge "grand"). Otherwise, the risk is creating challenges that replay a familiar litany of

lower level problems on the one hand, or vague problem statements that could not practically be addressed on the other. "Right-sized" grand challenges comprise a small handful of challenges that lift a profession's collective problem-solving sights, galvanize its imaginations, and focus its scientific and practical efforts over the span of decades.

Organizations also differ in the strategic platforms or programs they initiate to achieve the challenges. Some identify the grand challenges as a means of catalyzing work by others. Other organizations create targeted programs or fund teams to develop solutions to the challenges. Some organizations focus on implementing strategies to bring existing solutions to scale.

Uehara identified several benefits of a grand challenges approach, drawing on a list from Grand Challenges Canada (2011). The approach provides a focus that enables the gathering of talented people around important, shared, and solutions-focused goals. It can bring the best minds to the table by engaging with leading researchers world-wide who might not otherwise be engaged in the work. It can help build and strengthen communities of innovators that are collaborative, interdisciplinary, and global in perspective. It can capture the public's interest and imagination. It can garner new resources and talent through the coalescence of interest and investment and serve as a platform for "science diplomacy" and team science by bridging the divides between disciplines and ideologies. Finally, and most important, if the approach is successful, grand challenges initiatives can contribute to transformative societal change.

Uehara also identified several risks of a grand challenges approach. The brand has been diluted by the number of organizations that have taken this route in this past. Demands are placed on the time, attention, and resources of the organizations that both establish the grand challenges and seek to meet them. And there is no guarantee of success, though this risk is inherent in all investments in research and development.

The development of a set of grand challenges would be a high-risk, high-payoff path forward, Uehara concluded. She urged the discipline and profession of social work to take the risk.

The Grand Challenges for Engineering: A Case Exemplar—Matt O'Donnell, Presenter

The grand challenges issued in 2008 by the National Academy of Engineering were a response to several problems that became apparent in the 1990s, said Matt O'Donnell from the University of Washington School of Engineering. Technological problems, such as the threat of Y2K computer failures, highlighted the vulnerability of key infrastructures. Even more important, a gulf had developed between the practitioners of engineering and academic engineering, to the extent that engineers in industry were reluctant to hire the graduates of engineering education programs.

The National Academy of Engineering was a logical focus of reform because of its credibility in the engineering community and because its membership traditionally has consisted of half practitioners and half academics. The first step was a report that described the 20 greatest engineering achievements of the 20th century (Box 1). The key aspect of the list, noted O'Donnell, is that no one could look at it and not recognize innovations that had affected their lives.

The grand challenges, released in 2008, were the second step (Box 2). These challenges have served several complementary purposes, O'Donnell observed. They have helped bridge the divide between practice and research by focusing the attention of researchers on problems of

major and enduring significance. They have promoted engineering in the public at large. They have attracted a new generation of students to engineering. Most important, they have reinvigorated engineering education and redirected it toward practical problems that require innovative solutions. This educational component was advanced by several reports on engineering education that had a distinct effect on the preparation of students who would be tackling the grand challenges (National Academy of Engineering, 2005, 2009). For example, all engineering students from accredited programs are now required to have a practicum during their undergraduate years.

Box 1: Twenty Greatest Engineering Achievements of the 20th Century

1. Electrification – the vast networks of electricity that power the developed world.
2. Automobile – revolutionary manufacturing practices made the automobile the world's major mode of transportation by making cars more reliable and affordable to the masses.
3. Airplane – flying made the world accessible, spurring globalization on a grand scale.
4. Safe and Abundant Water – preventing the spread of disease, increasing life expectancy.
5. Electronics – vacuum tubes and, later, transistors that underlie nearly all modern life.
6. Radio and Television – dramatically changed the way the world received information and entertainment.
7. Agricultural Mechanization – leading to a vastly larger, safer, less costly food supply.
8. Computers – the heart of the numerous operations and systems that impact our lives.
9. Telephone – changing the way the world communicates personally and in business.
10. Air Conditioning and Refrigeration – beyond convenience, it extends the shelf life of food and medicines, protects electronics, and plays an important role in health care delivery.
11. Interstate Highways – 44,000 miles of U.S. highway allowing goods distribution and personal access.
12. Space Exploration – going to outer space vastly expanded humanity's horizons and introduced 60,000 new products on Earth.
13. Internet – a global communications and information system of unparalleled access.
14. Imaging Technologies – revolutionized medical diagnostics.
15. Household Appliances – eliminated strenuous, laborious tasks, especially for women.
16. Health Technologies – mass production of antibiotics and artificial implants led to vast health improvements.
17. Petroleum and Gas Technologies – the fuels that energized the 20th century.
18. Laser and Fiber Optics – applications are wide and varied, including almost simultaneous worldwide communications, non-invasive surgery, and point-of-sale scanners.
19. Nuclear Technologies – from splitting the atom, we gained a new source of electric power.
20. High Performance Materials – higher quality, lighter, stronger, and more adaptable.

Source: National Academy of Engineering, 2003.

Box 2: Grand Challenges of Engineering 2008

1. Make solar energy economical
2. Provide energy from fusion
3. Develop carbon sequestration methods
4. Manage the nitrogen cycle
5. Provide access to clean water
6. Restore and improve urban infrastructure
7. Advance health informatics
8. Engineer better medicines
9. Reverse-engineer the brain
10. Prevent nuclear terror
11. Secure cyberspace
12. Enhance virtual reality
13. Advance personalized learning
14. Engineer the tools of scientific discovery

Source: See http://www.engineeringchallenges.org.

Historical Achievements—Susan Kemp, Presenter

Social work has produced "grand accomplishments" in the past that have demonstrated our capacity to bring science to bear on the advancement of critical social change. These serve as models for future grand challenges. Susan Kemp, University of Washington School of Social Work, described two: the Children's Bureau infant mortality campaign and the Program for Assertive Community Treatment, a community mental health intervention.

The Children's Bureau was established in 1912 as a "national settlement with a specialty in children." It was developed, led, and staffed by social workers – primarily with backgrounds in the settlement houses. The bureau chose infant mortality as a strategic starting point for its work. This was a critical social issue affecting families of all classes, and it was not then on the agenda of other government agencies. At that time the medical system was focused largely on adults. Child mortality was also a gateway to other concerns, including housing, sanitation, maternal and child labor, and social inequities. As Julia Lathrop, the first head of the Bureau, said at the National Conference of Charities and Correction in 1912, "The questions raised by the unnecessary death of one baby lay hold on all social economy" (Lathrop, 1912, p. 31).

The Bureau's multilevel and multifaceted infant mortality campaign was built on the vision, real-world experience, research, and interventions of the Progressive-era settlement houses. It formed coalitions with women's clubs and other organizations; used epidemiological research as the basis for action; did multilevel outreach and interventions with individuals, households, communities, the nation as a whole, and even international groups; and engaged in political advocacy. Research focused on two fundamental questions: how many babies are dying, and why are babies dying? The Bureau conducted a national birth registration campaign with women's clubs and other grassroots organizations. Between 1912 and 1921, the number of states included within the national birth and death registration area rose from 8 to 35. From 1915 to

1920, comprehensive, year-long epidemiological studies were conducted in eight cities with large immigrant populations, with a focus on the "economic, social, civic, and family conditions surrounding young babies," in the words of Julia Lathrop. The central finding was the strength of the relationship between infant mortality and poverty. As Lillian Wald stated in 1930, "[The Children's Bureau] studies on family income and infant mortality reveal the forces moving through whole communities, family by family, determining how many babies will have a chance to live" (p. 458).

Drawing from the results of research, the Bureau engaged in multilevel outreach and intervention. It pursued individual and household interventions such as maternal education. It worked to improve communities and the environment in such areas as housing and sanitation. It conducted public education and advocated for legislation, including the Sheppard-Towner Act of 1921, which emphasized child and maternal health. Between 1910 and 1930 infant deaths in the United States dropped from 122 to 66 per thousand births (Almgren, Kemp, & Eisinger, 2000).

According to Kemp, the Bureau's campaign shifted prevailing paradigms (Almgren, Kemp, & Eisinger, 2000). It positioned social work as focused on prevention and upstream causes of adverse outcomes, not just categorical downstream interventions. It also expanded the prevention model to emphasize a holistic approach that addressed multiple, interacting causative factors. It had a clearly articulated aspirational vision: the well-being of the whole child. Within this vision, it had a strategic, cross-cutting focus, emphasized a social work prevention paradigm, used strategic partners for both implementation and advocacy, and engaged in intensive dissemination of scientific research and advocacy.

The second example that showcased social worker involvement is the Program of Assertive Community Treatment, a paradigm-shifting community mental health intervention that has been operating continuously since 1972. It began in part as a response to the 1963 Community Mental Health Act, which resulted in massive deinstitutionalization. At the time, community-based services and agencies were underprepared and uncoordinated, and there was growing concern about inadequate and ineffective services for the chronic and persistently mentally ill, who tended to cycle back and forth between the community and hospitals.

A series of research demonstration efforts supported by the National Institute of Mental Health included a 1970 study at Mendota State Hospital in Madison, Wisconsin, where it was recognized that the unit's innovative and spirited social worker, Barb Lotz, helped clients stay in the community successfully (Test, 1998). This realization contributed to a radical shift in the philosophy and practice of care, in which the community and not the hospital was recognized as the place where patients need the most help. The community became the primary locus of treatment, with intensive and individualized outreach, support, and services. Multidisciplinary teams provided assistance with daily living skills – coping rather than cure – with long-term engagement. Research demonstrated the success of the approach, leading to wide dissemination, in the United States and abroad, and ongoing testing and development (Rosen, Mueser, & Teesson, 2007).

These two achievements were quite different, said Kemp, but they have some common features. Both addressed a socially relevant, nationally important issue affecting multiple constituencies. Both entailed bold innovation and shifted prevailing orthodoxies. The contributions of social work were novel and added value by reframing prevention to include social and economic issues, by building knowledge, and by introducing interventions in key life settings. Both linked science

to action: interventions were grounded in or emerged from practice and knowledge was produced and refined in the context of application. And both engaged multiple constituencies as partners and champions for practice and policy change.

Prevention as a Potential Focus of a Social Work Grand Challenge—David Hawkins, Presenter

Over the past three decades, the science of preventing problems and promoting well-being in the population has undergone a sea change, observed David Hawkins from the University of Washington School of Social Work. Before the 1980s, tested approaches in such areas as preventing drug abuse and delinquency were largely ineffective. But 30 years of prevention research, summarized in a recent report by the Institute of Medicine (2009), has produced great advances in the understanding of predictors of mental, emotional, and behavioral problems and identification of tested and effective preventive policies and programs. For that reason, said Hawkins, prevention should figure strongly within the grand challenges adopted by social work.

Prevention science has revealed both risk factors and protective factors for adolescent problems. Some factors, such as poverty, family management problems or poor academic achievement, predict a number of adverse outcomes, which suggests that addressing those factors could have an effect on a variety of outcomes. Research also has demonstrated that preventive interventions can reduce numerous adverse outcomes, including school dropout, drug use, and crime. Programs and policies as diverse as prenatal programs, recreational programs, minimum drinking ages, and access to contraceptives have been tested and shown to be effective (Catalano et al., 2012). Furthermore, the benefits of these programs and policies typically exceed their costs, providing a powerful public policy rationale for implementing them (Aos et al., 2011). However, effective preventive interventions still are not widely used, Hawkins observed. Prevention is rarely a priority of governments, and practices without evidence of effectiveness are more widely used than are practices that have been shown to be effective. Epidemiological studies demonstrate that communities and indeed neighborhoods are different from one another in terms of levels of risk and protection and rates of positive and problem behavior (Catalano et al., 2002). This suggests that prevention must be place-based to address locally elevated levels of risk and depressed levels of protection. The current challenge is therefore to increase the use of appropriate tested and effective programs and policies while recognizing that communities differ from one another and want to decide locally what preventive interventions are relevant to the locally assessed needs (Fagan, Hanson, Hawkins, & Arthur, 2008).

Hawkins laid out a vision for 2032 that could form the basis for a grand challenge. Government, professionals, and the public at large would understand and use the advances of prevention science. Ten to twenty percent of the funds spent on children and adolescents would be used for effective prevention and development policies and programs. A database of effective prevention policies and programs would guide prevention spending. Advances from translational research on the adaptation, fidelity, and sustainability of preventive interventions would guide national, state, and local policy and practice. And epidemiological surveys of local levels of risk and protection, and of positive and problem behaviors, would guide community selection of appropriate tested, effective preventive interventions.

Social workers and social work researchers could take the lead in realizing this vision, Hawkins insisted. The vision is congruent with social work's values of preventing problems, promoting

well-being in the population and increasing equity between vulnerable populations and the larger society. Social workers and social work researchers could lead community prevention efforts and advocate at local, state, and national levels to improve the well-being of all children and adolescents. And they could rigorously evaluate the effectiveness of interventions in producing desired outcomes (Hawkins, 2006).

Housing as a Grand Challenge for Social Work—Deborah Padgett, Presenter

Homelessness and housing insecurity is another area that would lend itself to a grand challenge approach, as explained by Deborah Padgett from New York University Silver School of Social Work. On any given night, according to estimates that almost certainly understate the problem, 650,000 people are homeless in the United States. In 2010, 1.6 million people used a shelter or transitional facility. Meanwhile, the poverty level in the United States, which is a major predictor of homelessness, is once again approaching what it was in 1965 at the beginning of the War on Poverty.

By the late 1980s, the major approach to homelessness and housing insecurity involved what Padgett called the "homeless services institutional complex," characterized by shelters and drop-in centers, transitional housing programs, soup kitchens, and food pantries. For many people with serious mental illnesses who had been deinstitutionalized and were living on the streets, outpatient day programs, jails, drug and alcohol rehabilitation facilities, and emergency rooms were additional components of this complex. This approach was premised largely on controlling the problem through the control of homeless people, according to Padgett.

In the 2000s, a new approach began to emerge. Cost-offset studies, such as those by Culhane, Gross, Parker, Popper, & Sykes (2008), demonstrated that the provision of housing to homeless people saved money after considering the costs of emergency rooms, jails, and so on. In addition, an approach called Housing First, which developed from a program in New York City called Pathways to Housing, demonstrated the value of immediate access to permanent supportive housing as a more humane and cost-effective approach to homelessness. Housing First provides homeless people with someplace to live, without requiring them to demonstrate their worthiness before being granted a residence, and a randomized trial has demonstrated positive outcomes compared with treatment as usual (Stefancic & Tsemberis, 2007).

Padgett called attention to the theoretical and methodological developments that will be necessary to address the full range of issues involved in complex problems such as homelessness and housing insecurity. Social work science needs to identify and analyze relationships among multiple levels of complex systems at different spatial and temporal scales (Ostrom, 2009). The problems it confronts involve individuals, households, neighborhoods, communities, regions, the nation, and the globe. Early life exposures to poverty can cause cumulative and multiplicative health and mental health problems later in life.

Intangibles such as hope, empowerment, and a sense of belonging are very difficult to measure. Methodological innovations needed to meet these challenges include contextual, multilevel analyses, life-course perspectives, person-in-environment approaches, and mixed methods. Social work science, and the social sciences in general, are still far away from fully understanding the causal factors that lead to homelessness, Padgett commented. The scope and scale of innovations required in science, policy, and practice strongly lend themselves to a grand challenges approach.

Social Innovation as Signature of Social Work—Michael Sherraden, Presenter

Grand challenges involve achieving innovation at a large scale, commented Michael Sherraden from the Brown School of Social Work at Washington University in St. Louis. Social work can add—and has added—great value through the creation of such innovations. Social work science can help create the future innovations that will promote health and well-being for individuals, families, and communities.

We tend to think about innovation in technological, scientific, or economic terms, but in fact many of the greatest achievements in human history are "social" innovations, such as the rule of law, the organization of work, resolving differences peacefully, and the distribution of resources to benefit societal members.

Powerful social innovations do not "just happen" commented Sherraden. They are crafted, tested, put into place, evaluated—changed, rebuilt, and refined. Science, innovation, and implementation go hand in hand in the process. Rigorous experimentation that produces credible evidence is one important part of this process. But multiple methods and approaches are also necessary tools in developing effective social innovations. New knowledge in social work should enable effective action, which is a very high bar, Sherraden admitted, but this reflects the values of the field. Moreover, new knowledge should enable effective action across a wide range of settings, not just in the work of highly trained people in the best equipped organizations.

Moving Forward—Participant Discussion

The prospect of developing a set of grand challenges for social work generated great enthusiasm among roundtable participants. Grand challenges were seen to have potential to organize research and development around pressing social problems, coalesce groups of researchers and practitioners, and galvanize and unify the field.

Roundtable participants discussed the practical issues involved in creating grand challenges for social work, including how best to organize a national initiative. One option discussed by participants was to create a small leadership group working in a top-down manner. Another possibility would be to broadly canvas the social work community for input and ideas. Participants recalled Matt O'Donnell's comment that practitioners would have to be heavily involved in any grand challenges initiative in order for it to succeed.

Participants noted that a list of grand challenges for social work would need to be accompanied by an action plan to move the field forward to meet those challenges. Possible strategies for mobilizing the field include hosting regional grand challenge meetings, creating special issues or sections of journals on grand challenges for social work, issuing mini-grants designed specifically to foster progress on the grand challenges, involving the public media and utilizing cutting edge social media to spread the word, and securing technical assistance from beyond the profession. Creating a timeline for progress to establish expectations and maintain momentum will be imperative. In addition, the group suggested, as part of the planning it will be important to ask what would happen if the grand challenges do not spark the imagination of the field or of the general public. Will the exercise of establishing them then be of no consequence? Could failure further fracture the profession?

Rick Barth, President of the American Academy of Social Work and Social Welfare, whose membership cross-cuts arenas and levels of social work research and practice, suggested that the

Academy could provide leadership in developing the grand challenges. He also acknowledged that partnerships with other social work organizations would be necessary to move forward effectively and expeditiously.

Participants affirmed that social work's grand challenges need to build on past social work accomplishments, be grand in scope, and aspirational in content and direction. Each needs to have a major research component while also reflecting salient, broad-based priorities within our practice fields, as well as public sentiment. The grand challenges for social work must generate both interest and enthusiasm among a broad representation of social work stakeholders, members of the general public, and policy makers. Although being primarily externally focused on changes in society, they also need to motivate work on problems internal to the profession, such as training future researchers and practitioners to be well prepared for leadership both within current structures of science and in the translation of social work science into practice and policy.

Paralleling the already notable achievements of the Engineering profession in its Grand Challenges efforts, participants concluded, Grand Challenges could shape the mission of social work for the 21st century and more strategically and powerfully link science and technology to practice. They could also attract people to the field, both as researchers and as practitioners. Social work has abundant energy and intellectual capability. Now it needs to resolve to move the Grand Challenges forward.

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