

United Nations Policy Brief

Decent Work for All: Leveraging Big Data for a Human-Centered Approach to Sustainable Development

Alexander Gloss, North Carolina State University
Lori Foster, North Carolina State University & University of Cape Town
Deborah E. Rupp, Purdue University
John C. Scott, APTMetrics
Lise Saari, New York University
Mathian Osicki, IBM
Kristin Charles, Amazon
Drew Mallory, Purdue University
Dan Maday, Roosevelt University

“Scientific knowledge is not easily accessible to lay people and policy makers,” writes Detlof von Winterfeldt in the *Proceedings of the National Academy of Sciences* (2013, p. 14055). The United Nations means to change that. The Society for Industrial and Organizational Psychology means to help.

The [United Nations High Level Political Forum](#) (HLPF) is a central UN policymaker convening point, held for the purpose of reviewing and following up on the [2030 Agenda for Sustainable Development](#). Its mandates include guiding and leading the implementation of the Sustainable Development Agenda, stimulating policies informed by scientific evidence and country experiences, and addressing new and emerging issues that arise.

The next HLPF will take place on 11-20 July 2016. This will be the first HLPF to occur since the unanimous adoption of the [Sustainable Development Goals](#) in September of 2015. In preparation

for this event, the United Nations has created a [platform for crowdsourcing “science briefs”](#) to inform policy during the upcoming HLPF. This is an avenue for scientists from across the world to be heard at the highest levels of the UN in the form of concise, factual write-ups, which are based on peer-reviewed literature and highlight issues, research, and/or solutions to challenges faced by the UN and its member states. Selected briefs are included in the Global Sustainable Development Report, which is reviewed by policymakers at the HLPF.

The demand for industrial-organizational psychology’s scientist–practitioner perspective at the United Nations continues to grow. Late last year, the Society for Industrial and Organizational Psychology (SIOP) was asked to contribute a science policy brief, with a focus on “big data” in particular. SIOP is well positioned to inform discussions on this topic, given industrial-organizational (I-O) psychologists’ roles in collecting, shaping,

analyzing, and utilizing big data for decision making in organizational settings and other contexts. The increasingly prominent and powerful intersection between I-O psychology and data science is reflected in substantial [conference activity](#) and literature on this topic in recent years, including a SIOP Frontiers volume (Tonidandel, King, & Cortina, 2015) and a focal article on big data—with commentaries—in the journal *Industrial and Organizational Psychology* (Guzzo, Fink, King, Tonidandel, & Landis, 2015).

In the context of the United Nations Sustainable Development Goals, the nexus of data science and I-O psychology has particular relevance to [SDG 8](#), which endeavors to “promote inclusive and sustainable economic growth, employment and decent work for all.” Accordingly, SIOP’s science policy brief is titled: *Decent*

Brief for GSDR 2016

Decent Work for All: Leveraging Big Data for a Human-Centered Approach to Sustainable Development

By Alexander Gloss and Lori Foster in collaboration with the Society for Industrial and Organizational Psychology (SIOP) and SIOP’s committee of representatives to ECOSOC^{1,2}

In this brief we provide policy considerations for utilizing Big Data to promote Decent Work, review existing examples of the use of Big Data in support of Decent Work, and make suggestions about how Big Data can be further leveraged to support Decent Work and sustainable development. In particular, we argue for the need to consider people’s work-related goals, needs, and capabilities and to use innovative sources of data to better understand work in the informal economy.

Work for All: Leveraging Big Data for a Human-Centered Approach to Sustainable Development. It was accepted by the Global Sustainable Development Report Team on February 2, 2016; is [available online](#); and is reprinted below, in full.

References

- Guzzo, R. A., Fink, A. A., King, E., Tonidandel, S., & Landis, R. S. (2015). Big data recommendations for industrial–organizational psychology. *Industrial and Organizational Psychology, 8*(4), 491–508.
- Tonidandel, S., King, E., & Cortina, J. (Eds.). (2015). *Big data at work: The data science revolution and organizational psychology* (SIOP Organizational Frontiers Series). New York, NY: Routledge.
- von Winterfeldt, D. (2013). Bridging the gap between science and decision making. *Proceedings of the National Academy of Sciences (PNAS), 110*, 14055–14061.

1. Background

The world has resolved to ensure that all individuals can fulfill their human potential with dignity and equality – including by ensuring access to decent work (United Nations, 2015). People in emerging economies and from lower-income countries (LICs) are often excluded from the formal economy and excluded from fully utilizing the power of information technology for the benefit of their working lives (International Labour Organization, 2014; Van Dijk,

2005). Fortunately, the prevalence of “Big Data”³ provides previously unthinkable opportunities to more accurately measure, target, and improve working conditions and the lives of people engaged in or looking for work, even among those who lack full and equitable access to such technology (Tonidandel, King, & Cortina, 2015).

2. Policy considerations

2.1 Promoting Decent Work through Big Data requires ensuring that we are aware of people’s work-related goals, needs, and capabilities

When working conditions meet people’s fundamental needs, people tend to set their own challenging goals, develop skills, and gain a sense of self-efficacy (Locke & Latham, 2012). In turn, rewarding and productive work contributes to sustainable economic prosperity and job growth. Measuring people’s work-related goals, needs, and capabilities is critical to informing policy for sustainable development, and such insight is possible through the competent use of Big Data.

2.2 Promoting Decent Work through Big Data requires ensuring that people have competence, autonomy, and relatedness at work

Decades of research has documented at least three universal psychological needs – the need for competence in one’s actions, autonomy in the direction of one’s life, and relatedness to others (Deci & Ryan, 2012; Gagné & Deci, 2005). These psychological needs are often fulfilled in large part through meaningful forms of Decent Work. Whether or not people’s needs for

competence, autonomy, and relatedness are being met can be appreciated by asking the right questions and by accessing and analyzing Big Data in the right way.

2.3 Promoting Decent Work through Big Data requires us to respect what we know from research about how people work

The gathering, interpretation, and inferences made from information about workers’ lives should be guided by theory and existing research from the social and organizational sciences. Analysis of Big Data in relation to people in a work context can lead to misleading indicators, improper inferences, and even conclusions that are unintentionally discriminatory against vulnerable and protected populations (Illingworth, 2015; Whelan & Duvernet, 2015). For example, women’s empowerment at work continues to be a critically important aspect of global sustainable development; interventions based upon Big Data that do not take into consideration the unique challenges and obstacles that women face at work might only exacerbate those barriers.

2.4 Promoting Decent Work through Big Data requires us to build a common language about work

Although job descriptions and other forms of information about private sector organizations’ human resources present considerable promise for use by policy-makers, their utility is limited by a lack of generalizable data standards, taxonomies, and metrics. Progress is being made to align data-collection in the private (e.g., www.hropenstandards.org) and public

sector (e.g., www.skillsforemployment.org), yet considerable development still needs to be made. An important way of aligning information about workers' lives is being led by UNESCO as it works to build a global framework of workforce qualifications (Keevy & Chakroun, 2014).

2.5 Promoting Decent Work through Big Data requires us to ensure that the use of Big Data is not a threat to the people it is meant to help

Standards for the effective and ethical use of Big Data need to be respected to protect individuals' rights and psychological wellbeing. SIOP has made a series of recommendations for the use of Big Data in the context of work (Guzzo, Fink, King, Tonidandel, & Landis, 2015). These recommendations help to highlight the unique likelihood of Big Data to violate norms of privacy, informed consent, and a sense of personal control over one's life. Methods to avoid harm and personal violations in working contexts include ensuring participation in deciding how and when one is being observed and ensuring transparency regarding data-collection and data use (Guzzo et al., 2015; Karim, Willford, & Behrend, 2015).

3. Examples of Using Big Data to promote Decent Work

3.1 Insight into unemployment sentiment via Twitter

In coordination with the United Nations Global Pulse Lab, analysis of social media data has added depth to unemployment statistics by developing leading indicators of economic activity based upon the tone of online conversations (SAS, 2011).

3.2 Identifying promising entrepreneurs in LICs via adaptive surveys

In order to identify potential entrepreneurs deserving of financial loans but without the necessary formal documentation and credit history, computerized psychological tests have been built and deployed in several countries in Africa and South America (Klinger, Khwaja, & Carpio, 2013). These tests increase in predictive accuracy based upon a constantly evolving global database and help to open doors for sustained economic growth in LICs.

3.3 Painting a picture of work interests and skills through mobile phones in Tunisia

In partnership with UNESCO, civil society and private-sector actors in Tunisia have constructed a mobile-based platform to gather information about mobile phone users' vocational interests and career-development skills and to inform those users of career development opportunities and best-practices (GSMA, 2014).

4. Promising Sources of Big Data to Promote Decent Work

4.1 Big Data that supports Decent Work can come from collecting job description information and combining it with other data about work

A relatively under-utilized form of detailed information about people's working lives is available in the form of job descriptions. Building upon datasets that allow comparisons between jobs, the World Bank and organizational researchers have combined occupational information with occupational employ-

ment figures to produce regional profiles of workforce characteristics and worker needs and capabilities (Gloss, Foster-Thompson, Klinger, & Wright, 2010; World Bank, 2013).

4.2 Big Data that supports Decent Work can come from crowdsourced work-interest inventories

Another under-utilized form of insight into worker's lives are vocational interest profiles. These profiles, which allow individuals to assess their own career interests, can provide individual a more accurate picture of possible career options and policymakers a more detailed picture of labor-force characteristics. For example, the Occupational Interest Profiler built by the United States Department of Labor has been widely used internationally by individuals who are entering the work force or making career transitions (Rounds, Su, Lewis, & Rivkin, 2010). In addition, public sector actors in other countries, including in the Republic of South Africa, have worked to leverage insight from vocational interest surveys to provide their workers with career insights and tools (United Nations Development Programme, 2014).

4.3 Big Data that supports Decent Work can come from aggregating survey pulses

A promising additional method of data collection about workers' lives has precedent in the private sector. Many leading corporations have innovated by administering micro-surveys to evaluate their workers' levels of work "engagement" on a regular basis (see Macey & Schneider, 2008). Global, national, and/

or regional pulse surveys administered via mobile devices that assess critical aspects of workers' lives could greatly assist in providing accurate and timely insight into skill gaps, threats to decent work, and emerging work trends. Such pulse surveys would need to deliberately include workers involved in the informal economy and in vulnerable forms of employment. Micro surveys and greater utilization of Big Data in work contexts could also help to address a particularly problematic threat to decent work – the absence of living wages. Mobile applications to help entrepreneurs and family workers track their income and expenditures could provide aggregated insight into the conditions and challenges of those in the informal sector.

Notes

- ¹The views and opinions expressed are the authors' and do not represent those of the Secretariat of the United Nations. Online publication or dissemination does not imply endorsement by the United Nations. Authors can be reached at UN@siop.org and more information can be found at <http://www.siop.org/Prosocial/UN.aspx>.
- ² Special thanks to Pamela Flattau from Psychology of Science in Policy for her advice and assistance in this brief.
- ³ For purposes of this analysis, "big data" signifies data of such volume (i.e., the size of data in terms of bytes), velocity (i.e., the speed at which data is created and/or loses currency), and/or variety (i.e., data's structural complexity, its lack of structure, and/or the connections of one or more data sub-sets to other sub-sets) as to make traditional data-analytic methods difficult or impossible (McAfee & Brynjolfsson, 2012).

References

- Deci, E. L., & Ryan, R. M. (2012). Motivation, personality, and development within embedded social contexts: An overview of self-determination theory. In R. M. Ryan (Ed.), *Oxford handbook of human motivation* (pp. 107-85). Oxford, UK: Oxford University Press.
- Gagné, M., & Deci, E. L. (2005). Self-determination theory and work motivation. *Journal of Organizational Behavior*, 26, 331-362.
- Gloss, A. E., Foster-Thompson, L., Klinger, B., & Wright, N. A. (2014, May). *Using occupational-information and trade data to understand economic development*. Paper presented at the 29th annual meeting of the Society for Industrial and Organizational Psychology, Honolulu, HI.
- Guzzo, R. A., Fink, A. A., King, E., Tonidandel, S., & Landis, R. S. (2015). Big data recommendations for industrial–organizational psychology. *Industrial and Organizational Psychology*, 8(4), 491-508.
- GSMA. (2014, February 11). *Najja7ni: Mobile learning services for improving education, English language skills and employment opportunities in Tunisia*. Retrieved from www.gsma.com
- Illingworth, A. J. (2015). Big data in I-O psychology: Privacy considerations and discriminatory algorithms. *Industrial and Organizational Psychology*, 8(4), 567-575.
- International Labour Organization. (2014). *World of work report 2014: Developing with jobs*. Retrieved from www.ilo.org
- Karim, M. N., Willford, J. C., & Behrend, T. S. (2015). Big data, little individual: Considering the human side of big data. *Industrial and Organizational Psychology*, 8(4), 527-533
- Keevy, J. & Chakroun, B. (2014). Level best: A global study on the use of level descriptors in the 21st century. Retrieved from www.unesco.org
- Klinger, B., Khwaja, A. I., & Carpio, C. (2013). *Enterprising psychometrics and poverty reduction*. doi: 10.1007/978-1-4614-7227-8
- Locke, E. A., & Latham, G. P. (Eds.). *New developments in goal setting and task performance*. London, UK: Routledge.
- Macey, W. H. & Schneider, B. (2008). The meaning of employee engagement. *Industrial and Organizational Psychology*, 1, 3-30.
- McAfee, A., & Brynjolfsson, E. (2012). Big data: The management revolution. *Harvard Business Review*, 90(10), 59-68.
- Rounds, J., Su, R., Lewis, P., & Rivkin, D. (2010). *O*NET Interest Profiler Short Form Psychometric Characteristics: Summary and Supporting Evidence*. U.S. Department of Labor National O*NET Resource Center.
- SAS. (2011). *Using social media and online conversations to add depth to unemployment statistics*. Retrieved from www.unglobalpulse.org
- Tonidandel, S., King, E., & Cortina, J. (Eds.). (2015). *Big data at work: The data science revolution and organizational psychology* (SIOP Organizational Frontiers Series). New York, NY: Routledge.
- United Nations Development Programme. (2014). *The role of the private sector in inclusive development: Barriers and opportunities at the base of the pyramid* (A report by the Istanbul International Center for Private Sector in Development). Retrieved from <http://www.undp.org>
- United Nations. (2015). *Transforming our world: The 2030 agenda for sustainable development*. Retrieved from www.un.org
- Van Dijk, J. A. G. M. (2005). *The deepening divide: Inequality in the information society*. Thousand Oaks, CA: Sage Publications, Inc.
- Whelan, T. J., & DuVernet, A. M. (2015). The big duplicity of big data. *Industrial and Organizational Psychology*, 8(4), 509-515
- World Bank. (2013). *From occupations to embedded skills: A cross-country comparison* (Background paper for the World Development Report 2013). Retrieved from www.worldbank.org