

A Research Agenda for the Vocational Psychology of Agriculture

Peter McIlveen

University of Southern Queensland

AUTHOR NOTE

Peter McIlveen, School of Linguistics Adult & Specialist Education, Faculty of Business Education Law & Arts, University of Southern Queensland.

Correspondence concerning this article should be addressed to Peter McIlveen, University of Southern Queensland, Toowoomba, QLD, 4350, Australia; peter.mcilveen@usq.edu.au

Note. This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development*, 24(3), 157-165. doi: 10.1177/1038416215586005

Abstract

The Vocational Psychology of Agriculture—Farming Food and Fibre is advanced in this paper. It is argued that vocational psychology can and should provide a substantive contribution to agriculture by solving problems associated with labour supply and the quality of work, particularly the problems of poverty and hunger that blight the world. Despite its scientific and professional capability, the immediate problem is that vocational psychology lacks an epistemology and knowledge base on which to advance its contribution to agriculture. The Vocational Psychology of Agriculture—Farming Food and Fibre is motivated by the ethical vision of the psychology of working perspective. The Systems Theory Framework of career is used as a prism to render a research agenda for the Vocational Psychology of Agriculture—Farming Food and Fibre. The Systems Theory Framework enables the integration of conceptually different vocational psychology theories. When coherently organised by the Systems Theory Framework, these theories will furnish novel research questions that may populate the research agenda and, ultimately, foster research and development that enhance agriculture's capacity to feed and clothe the world.

Keywords: vocational psychology, career development, agriculture, STF, psychology of working

Note. This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development*, 24(3), 157-165. doi: 10.1177/1038416215586005

A Research Agenda for the Vocational Psychology of Agriculture

As the human population continues to grow, the demand for food continues to outstrip the security of its supply. This conundrum is not a problem of any single nation state; it is an international problem—a problem for humanity. Its importance is manifest in the Millennium Development Goals (MDGs) as the eradication of extreme poverty and hunger. Despite halving the prevalence of extreme hunger since the inception of the MDGs, the rate of improvement is decelerating and more effort is required to maintain the downward trajectory of the prevalence of hunger (United Nations, 2014). Regular access to nutritious food is not just a problem of production and supply, as there are other causes such as conflict and corruption; however, sustainable and equitable production of food is a vital part of the solution.

In this paper, I assert that vocational psychology has the scientific and professional capability to make a substantive contribution to agriculture. To that end, the three objectives of the Food and Agriculture Organization of the United Nations (FAO) succinctly capture the intent of the research agenda for the *Vocational Psychology of Agriculture—Farming Food and Fibre* (VPA—FFF) that is proffered in this paper:

1. the eradication of hunger, food insecurity and malnutrition;
2. the elimination of poverty and the driving forward of economic and social progress for all; and,
3. the sustainable management and utilization of natural resources, including land, water, air, climate and genetic resources for the benefit of present and future generations (FAO, 2015).

Note. This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development*, 24(3), 157-165. doi: 10.1177/1038416215586005

Thus, I suggest that the VPA—FFF is motivated by an ethical mandate to contribute to the social and emotional wellbeing of the world's population.

The VPA—FFF is a multidisciplinary endeavour because the scope of agriculture is so wide that it cannot be researched from a narrow perspective. I formulate the research agenda for VPA—FFF on the basis of the Systems Theory Framework of career (STF; Patton & McMahon, 2014) because, as an organising framework, its conceptual tenets and scope of perspective are sufficiently broad to capture the complexity of agriculture and the problems to be solved in agriculture. Furthermore, the STF is a framework for multidisciplinary scholarship that can bring together psychology and other social sciences that contribute to agriculture (e.g., sociology).

Absence from the Field of Agriculture

In the paper titled “The Psychology of Farming: A Review of Twenty-five Years of Research”, Richards (1973, p. 485) lamented, “psychologists have largely ignored agriculture”. Nowadays this attitude is no different. Richards claimed:

If all of mankind is to have an adequate diet, we must both stabilize world population and increase markedly world food supply. Moreover, attaining any such increase in food supply may be as much a problem in vocational psychology (e.g., the skill, knowledge, openness to change, and motivation of farmers) as in agricultural technology (p. 485).

There are rare examples of vocational psychology research appearing in the literatures of other disciplinary fields (e.g., agricultural education; Esters, 2007, 2008).

Unfortunately, vocational psychology's contribution to agriculture over the past four

Note. This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development, 24*(3), 157-165. doi: 10.1177/1038416215586005

decades is diminishingly insignificant when contrasted against its contributions to other industries (e.g., education).

To support this assertion, in March 2015, I conducted a limited search for literature in the database *PsycArticles*. This exploration involved broad search terms (i.e., peer-reviewed papers published by all publishers, under all classifications, with a human population, and the subject term “agriculture”). The result was 12 papers since 1910. Four papers were relevant to vocational psychology: three addressed the measurement of interests (Ahmann, 1955; Glick, 1964; Remmers, 1929) and one, ironically, addressed psychologists’ service to agriculture (Tolman & Likert, 1942). The publication years of those papers speak volumes. To labour the point, a similar search using the subject term “farm” revealed 19 papers over the past century and, again, not all pertained to vocational psychology. Of course, there is a caveat on interpreting these findings: *PsycArticles* is one database; albeit a database for premiere applied psychology journals published by the American Psychological Association and eight other organisations.

To crosscheck these findings, I conducted a manual search for articles, separately with the terms “agricultur*” and “farm” in the title, subject, or abstract, of the three highest impact factor, scientific journals that subsume vocational psychology (viz. *Journal of Vocational Behavior*, *Journal of Counseling Psychology*, and *Journal of Applied Psychology*). Of course, there are other journals that subsume vocational psychology; however, these three are the premiere journals and, therefore, ostensibly represent the cutting edge of the field. Some articles discovered in the search were excluded if they were irrelevant to vocational psychology; for example, the paper by Mahoney and Baker (2007) was an historical paper on the development of a social

Note. This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development*, 24(3), 157-165. doi: 10.1177/1038416215586005

science research method with no substantive relevance to vocational psychology, but its detection in the search was due to its association with a government department of agriculture. The results of this manual search corresponded with the volume of papers found by the search within *PsycArticles*, and the results were:

- *Journal of Vocational Behavior* (Campbell & Holland, 1972; Richards, 1972, 1973, 1977; Willock et al., 1999; Zekeri, 1992);
- *Journal of Counseling Psychology* (Glick, 1964; Heppner, Cook, Strozier, & Heppner, 1991); and,
- *Journal of Applied Psychology* (Brayfield & Marsh, 1957; Burt & Ives, 1923; Eden & Leviatan, 1974; Grigg, 1948; Pressey & Thomas, 1919; Remmers, 1929; Richards & Claudy, 1973).

Ranging over 80 years, 1919 to 1999, the rounded average year of publication is $M = 1962$ ($SD = 24.34$) and $Mdn = 1972$. Not one of these papers is published in the current century!

That vocational psychology is effectively absent from the field of agriculture is a two-fold loss: first, to the discipline itself, as, like all others, vocational psychology must demonstrate its relevance to society, and what better way than by enhancing an industry that provides the food and fibre of life; and, second, vocational psychology's absence is a loss to the world of work that needs research and interventions directed to understanding the role of, and improving the quality of, work in people's lives, particularly work that is relatively less prestigious (cf. Casper & Swanberg, 2011).

Contemporary agriculture is not the same industry of the 1960s and 1970s. Its levels of technological advancement and productivity are inconceivably different. In

Note. This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development*, 24(3), 157-165. doi: 10.1177/1038416215586005

contrast, vocational psychology has not kept pace with agriculture's scientific progress. An intensive program of psychological research is required to keep pace with agriculture.

The Research Prism: Systems Theory Framework

Patton and McMahon do not proffer the STF as a theory per se. Instead, Patton and McMahon (2014) present the STF as an integrative framework that recognises the contributions of multiple theories and the career *influences* identified by those theories:

The STF is not designed to be a theory of career development; rather systems theory is being introduced as the basis for an overarching framework within which all concepts of career development described in the plethora of career theories can be usefully positioned and utilised in the theory and practice. (p. 240)

As a framework that is based on a contextualist epistemology, the STF positions career influences in relation to one another, extending from the most distal environmental and societal influences through to the most proximal interpersonal and personal influences. In order to do justice to the systems, contextualist epistemology of the STF, how the influences interact with one another is to be theorised as much as the influences in and of themselves.

Patton and McMahon (2014) emphasise the individual amidst systems of career influences—note the plural words systems and influences. Within the STF the individual is the crucible of the systems of influences and their meaningfulness, and story is the grist of meaningfulness. Thus, the STF is inherently psychological but welcomes contributions from other disciplines that address the individual in context

Note. This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development*, 24(3), 157-165. doi: 10.1177/1038416215586005

(e.g., sociology). Accordingly, the research agenda articulated in this paper draws on the research of other social sciences (e.g., economics, agricultural science), not only because of vocational psychology's marginal contribution to agriculture, but also because the STF enables the application of knowledge from other disciplines. What follows is a sketch of literature spanning the environment-social system as a way to frame the research problems to be addressed by VPA—FFF.

The Environmental-Societal System

Agriculture is a signature of humanity, with its history extending to the dawn of settlement-based civilisations in the regions now known as the Middle East, north Africa, India, and China. Agriculture's history is evident in evolving ways of knowing (e.g., record-keeping), practices (e.g., seasonal planting, animal husbandry), and technologies (e.g., plough, granary), all contributing to the production of divergent staples (e.g., wheat in north Africa and Middle East, rice in China, corn in South America) that underpinned regional cultures. Concomitant with agriculture's history are the changing qualities of the Earth's land, water, and air that make for a geological and geographical tapestry with conditions varying according to region, season, and nature's vagaries.

As an industry in the contemporary era, agriculture is complex in its: (a) unprecedented technological advances (e.g., genetically modifications that eliminate the need for poisonous pesticides); (b) supply chains and logistics for the movement of products from one side of the planet to the other (e.g., air, sea, and land); (c) educational systems ranging from PhD degrees earned in university research laboratories through to peasant family-based teaching and learning; and (d) business management, marketing, and trading firms listed on international stock exchanges,

Note. This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development*, 24(3), 157-165. doi: 10.1177/1038416215586005

through to a sole-trader business owned and operated by a woman in a war-torn village. Indeed, in the contemporary era, preparing a meal with produce from two to three continents is no longer a novel experience. Similarly, all too familiar for many people is subsistence farming to eke little more than undernourishment.

In the world's fastest growing region, Asia Pacific (FAO, 2014a), in 2011, there were agricultural exports to the value of \$US142 billion and imports of \$US203 billion (FAO, 2014b). Asia Pacific holds 40% of the world's agricultural land and 25% of its agricultural population, and half of the world's population (FAO, 2014a, p. 2). Consistent with the MDGs, Asia experienced a sharp decline in the prevalence of undernourishment in the order 23.7% (1990–1992) to 12.7% (2012–2014) (FAO, 2014b). This decline is evidence of positive progress toward the MDGs; however, the change in that decade is most evident in China, a nation experiencing increased wealth. Other Asian nations experienced relatively limited changes in comparison. Thus, just this one region is an extraordinarily complex mixture of population, production, and trade.

The contribution of agriculture to society is exemplified in the productivity of Australia, which is within the Asia Pacific region. With respect to employment, the multiplier effect of agriculture is seen in its supply chain. In the year 2010-11, approximately 307 000 people were directly employed in agriculture (i.e., “on-farm”) and there were more than 1.6 million jobs in its supply chain (National Farmers' Federation, 2012). Thus, in this one country, in just one region of the world, one on-farm job multiplies out to five jobs. Contrast this positive statistic with the official description of Australia's agricultural environment:

Note. This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development, 24*(3), 157-165. doi: 10.1177/1038416215586005

Australia's agricultural landscapes support a wide range of soils. Most are ancient, strongly weathered and infertile by world standards, with deficiencies in phosphorus and nitrogen. Very few are considered good quality soils for agriculture. Fragile soil structure and a susceptibility to waterlogging are other common features of Australian soils, while large areas are naturally affected by salt or acidity. These soil characteristics restrict particular agricultural activities, sometimes ruling out agricultural activity altogether. With the exception of Antarctica, Australia is the world's driest continent. More than a third of the continent is effectively desert, and over two-thirds of the continent is classified as arid or semi-arid (Australian Bureau of Statistics, 2012).

In reading this dismal description, one's enthusiasm for agriculture may very well wither on the vine.

Yet, despite these extreme conditions, Australia's agricultural industry achieves extraordinary production levels. And, it is the juxtaposition of privation and productivity that gives reason to enthusiastically call on vocational psychology to make a contribution. It is an unequivocal fact that the shortage of labour supply further complicates the state of agriculture in the Asia Pacific region. The conundrum is that "more knowledge- and capital-intensive techniques will be needed to increase production and provide food at affordable prices" (FAO, 2014a, p. 14). Without an appropriately educated labour force for agriculture, across the supply chain, the good work toward the MDGs that has reduced the prevalence of hunger may be diminished with tragic effect. Developing a sustainable labour force is a site at which vocational psychology can make a significant contribution to research, education, and practice.

Note. This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development*, 24(3), 157-165. doi: 10.1177/1038416215586005

In the context of a public policy environment that encourages investments in science, technology, engineering, and mathematics (STEM) careers (e.g., OECD, 2014), vocational psychology research is already making useful contributions to understanding the factors that influence students' choices and efficacy with respect to STEM careers, particularly the interactions among self-efficacy, race, and gender (Byars-Winston, Estrada, Howard, Davis, & Zalapa, 2010; Cordero, Porter, Israel, & Brown, 2010; Lee, Flores, Navarro, & Kanagui-Muñoz, 2015; Lent et al., 2005; Lent et al., 2015). It is conceivable that the extant vocational psychology research into STEM may readily transfer to agriculture. Clever thinking has included A for agriculture in that acronym for it to become STEAM. This clever modification highlights the importance of STEM research and education to agriculture, and it highlights that agriculture is just as important as these sciences in their pure and applied manifestations.

The environmental-societal system is the level at which vocational psychology has contributed the least, relative to the social system and personal system. This is not surprising because the influences that make up the societal-environmental system are not the primary focus of the discipline. Nonetheless, there is reason for optimism. Blustein's paradigmatic *psychology of working* (Blustein, 2006, 2008, 2013a) extends the remit of vocational psychology from the distal influences of public policy through to the lived experience of the individual. Blustein (Blustein, 2013b) and colleagues direct their scholarly attention to career influences that are, by-and-large, problems in, with, and for society (e.g., poverty, unemployment). The psychology of working can serve as a thread to connect career influences across the various systems. Recent conceptual and empirical advances better integrate social influences such as social

Note. This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development*, 24(3), 157-165. doi: 10.1177/1038416215586005

class (e.g., Diemer & Rasheed, 2009; Liu & Ali, 2005) along with attempts to conceptualise the individual's phenomenological experience of social class (e.g., McIlveen, Beccaria, du Preez, & Patton, 2010), and merge theory and practices (Blustein, Kozan, Connors-Kellergren, & Rand, 2015).

The Social System

Importantly, the STF positions the individual amidst a system of career influences that are interpersonal (e.g., peers, family) and social (e.g., school, community). Agriculture is a profoundly social industry. Consider that 88% of the world's 570 000 000 farms are family farms (Lowder, Skoet, & Sing, 2014). Ninety-nine percent of the 134 000 farm businesses in Australia are owned by families (National Farmers' Federation, 2012), not a corporation. "Family farms produce about 80 percent of the world's food, and collectively they are the largest source of employment worldwide" (FAO, 2014c, p. v). Indeed, the United Nations declared 2014 the Year of Family Farming.

The picture of family farming is complex, however, with variations among nations, regions, and economic conditions. Coexistent with family farming is child labour. The International Labour Organization estimates that approximately 98 000 000 children, or 59% of the population of child labour can be found in agriculture (International Labour Office, 2013). In the vast majority of cases, children are working in family farms due to grinding poverty (FAO, 2010). Improving the quality of rural work, accessing employment and education, and promoting social dialogue are seen as partial policy solutions to involuntary child labour in agriculture.

Significant progress is evident in vocational psychology research that addresses the career influences within the social systems. The field's demonstrable

Note. This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development*, 24(3), 157-165. doi: 10.1177/1038416215586005

commitment to social justice attests to this assertion (e.g., the emancipatory communitarian approach, Blustein, McWhirter, & Perry, 2005). Important career influences in the social system include: family (Whiston & Keller, 2004); culture (Stead, 2004); race (Flores, 2013); and the intersections of these influences (Hall & Mirvis, 2013), notably the overlap of paid work and family conceptualised as *market work* and *care work* (Richardson, 2012; Richardson & Schaeffer, 2013), and the emerging relational perspective on career (Blustein, Schultheiss, & Flum, 2004; Schultheiss, Kress, Manzi, & Glasscock, 2001). This body of research provides the contextual foundations for research into agriculture, for many of these career influences are predominant in agriculture.

Given that family farming is widespread, Richardson's (2012) research into the intersection of paid and unpaid work, family, and relationships, is an ideal point of departure to explore family farming. For example, sociological research highlights how family influences the formation of identity as a farmer (Mann, 2007). Just as crucial is the notion of giving up being a farmer and selling the family farm (Kuehne, 2013).

The Individual System

With the individual at the centre of the STF, the traditional grist of self-concept, interests, values, knowledge, abilities, and skills, must be considered. Fortunately, there is no shortage of theories and practices in vocational psychology and career development that may coherently formulate these myriad personal influences; and it is this fecund conceptual substrate in which a vocational psychology of agriculture may grow (i.e., the VPA—FFF).

Note. This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development*, 24(3), 157-165. doi: 10.1177/1038416215586005

A study of Scottish farmers found that their Extraversion, Openness to Experience, and Conscientiousness, and intelligence (measured by progressive matrices and reading tasks) influenced participants' production-oriented and environmentally-oriented behaviour (Austin, Deary, & Willock, 2001; Willock et al., 1999). Social psychological research indicates that, despite environmental rhetoric in the UK, there is evidence for the persistence of farmers' identity as being production-oriented (Burton & Wilson, 2006).

A study involving Australian farmers produced a psychometric measure of values (Maybery, Crase, & Gullifer, 2005). These values are as follows: (a) Economic (e.g., A maximum annual return from my property is my most important aim); (b) Lifestyle (e.g., A rural environment is a great place to raise children); and, (c) Conservation (e.g., Land stewardship by farmers is more important than anything else about farming). Although the factor structure of the measure and internal consistency of the subscales were acceptable, the study did not report validity data with respect to relevant predictive criteria (e.g., work engagement and satisfaction). Subsequent Australian studies found that lifestyle/conservation, economic/financial, and social values predicted conservation behaviour and inclination to implement government policies (Greiner & Gregg, 2011) and that these values interact with risk tolerance/propensity (Greiner, Patterson, & Miller, 2009). These studies focusing on dispositional traits are a useful point of focus for understanding the career of farmers because these traits influence farmers' long-term commitment to sustainability and the intrinsic importance of land, which is, ultimately, their work and livelihood. For example, Greiner et al. (2009) found that the lifestyle/conservation and social values correlated with graziers' intent to destock their land in times of drought. Such a

Note. This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development*, 24(3), 157-165. doi: 10.1177/1038416215586005

decision is taken as a last resort to save the animals and the land from destruction. Understanding the career-related dimensions of such decisions are crucial, particularly when considered in light of the finding that the psychological impact of prolonged drought is influenced by farmers' sense of connection to the land and hopefulness (Stain et al., 2011). Moreover, these findings may converge with extant vocational psychology theory that focuses on dispositional traits and engagement in work.

Research into the career exploration and decision-making of students enrolled at agricultural college suggests that friends have a strong influence on students' decisions (Esters & Bowen, 2005). Furthermore, students at an agricultural college experience levels of career decidedness and exploration behaviours that indicate a need for integrated career development learning in the curriculum (Esters, 2007, 2008; Esters & McCulloh, 2008). Vocational psychology has empirical, conceptual, and pedagogical bases on which to build curriculum-integrated career development learning (McIlveen et al., 2011; Reardon, Lenz, Sampson, & Peterson, 2009; Watts, 2006) and enhance students' employability (Fugate, Kinicki, & Ashforth, 2004). Thus, vocational psychology can readily contribute to agricultural education in universities and colleges, and work-based extension education in the field.

Recommendations

The following recommendations are the foundation for a research agenda for the VPA—FFF. As an agenda, it is not complete.

1. Use the STF's categorisation of career influences according to theories of content, process, and content and process, to audit extant vocational

Note. This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development*, 24(3), 157-165. doi: 10.1177/1038416215586005

psychology theories' relevance to career influences that are predominant in agriculture.

2. Use the STF to select concepts and theories generated by other psychology sub-disciplines (e.g., personality and individual differences, economic psychology, community psychology) and other social sciences (e.g., sociology, economics) that have a substantive literature on agriculture to:
 - a. provide novel perspectives on extant vocational psychology theories;
 - b. inform the development of new research questions and hypotheses pertinent to agriculture; and,
 - c. foster transdisciplinary communication whereby vocational psychology theory and research is articulated to those prominent disciplines in the field.
3. Use the STF to theorise potential connections between career influences present in different systems of career influences (i.e., environmental-societal, social, personal) and theorise those connections if extant vocational psychology theory cannot accommodate research questions and hypotheses derived from the putative connections.
4. The VPA—FFF agenda should be aligned with other educational and technological agenda that have purchase on public policy and the public's imagination. Thus, it is recommended that the VPA—FFF align with the STEAM agenda of bringing agriculture into the frame of science, technology, engineering, and mathematics.

This foundation must be built upon to further articulate the agenda into specific domains, such as the various industries within agriculture (e.g., production

Note. This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development*, 24(3), 157-165. doi: 10.1177/1038416215586005

horticulture, meat and livestock, broad acre cropping) and regional contexts that have different agronomic characteristics (e.g., dryland, irrigated cropping, or floodplain) that have unique labour force and skills requirements.

Theorising the Case of Jo through STF

Consider the ostensibly simple aspiration of a young person, Jo, who says “I will be a farmer”. The STF instructs the scholar of vocational psychology and the career development practitioner to conceptualise a person’s aspiration as more than the sum total of his/her desire to be a farmer. With respect to the aforementioned recommendations, an audit of extant theories in vocational psychology, with Jo’s case in mind, would find that most of the theories would readily theorise the expressed occupational goal. For example, the social cognitive career theory (SCCT; Lent & Brown, 2013) would stipulate *self-efficacy*, *outcome expectations*, *interests*, and *goals* as constructs to explain and predict Jo’s situation. Jo may feel quite efficacious for farm work and desire the benefits of income generated through farming; thus, Jo expresses farming as a socially valorised interest and goal. Thus, the SCCT would pass the audit of Recommendation 1. Indeed, the conceptual value of the SCCT is demonstrated in a career education intervention that targets agricultural science students’ outcome expectations (Turner & Hawkins, 2014).

In context of other influences, for Jo, working as a farmer may be more complicated than a straightforward occupational interest, choice, and goal. In fact, it may not be a choice due to influences beyond Jo’s personal system of influences. Accordingly, there is a need to connect personal career influences well theorised by SCCT to Jo’s wider context that impinges on an aspiration being a voluntary choice or decision that has already been made by contextual influences. Jo’s context may

Note. This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development*, 24(3), 157-165. doi: 10.1177/1038416215586005

include the influences of poverty or unemployment. It may be that Jo is under family pressure arising from cultural mores, such as an assumption that the eldest child will inherit the farm so as to carry on the family tradition. How might the STF be used to support the SCCT managing these conceptual challenges?

Current explications of the SCCT conceptualise external factors that promote or inhibit career development as proximal and distal *contextual affordances* (Lent, Brown, & Hackett, 2000) and goal-relevant environmental supports, resources, and obstacles (Lent & Brown, 2006). Conceptually and empirically integrating other social cognitive constructs from other theories that connect personal influences to contextual influences can enhance the SCCT's theoretical power and the STF can guide the selection of those constructs. For example, as per Recommendation 2, the vocational psychology notion of *volition* (Duffy, Diemer, Perry, Laurenzi, & Torrey, 2012) connects personal beliefs with situational constraints and may affect Jo's self-efficacy's effect on outcome expectations.

Following the notion of volition and its meaning with respect to self-perception of capability given constraints, theorisation may be further enhanced by calling on other branches of psychological theory that are compatible with SCCT, and thereby implement Recommendation 2. For example, the notion of volition can be understood from the perspective of self-determination theory as a form of *autonomy* (Gagné & Deci, 2005; Van den Broeck, Vansteenkiste, De Witte, Soenens, & Lens, 2010).

Nothing has been said of Jo's culture, geographic location, or nationality, and how these affect personal factors. These are just a few other influences that may alter the dynamics of Jo's goal to work as a farmer, and the STF can guide the selection of

Note. This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development*, 24(3), 157-165. doi: 10.1177/1038416215586005

constructs and theories to inform hypotheses that remain consistent with the main vocational psychology theory in use, in this case the SCCT. Thus, drawing on other discipline's theories may provide additional perspectives on volition. For example, the notion *habitus* in sociological theory (Bourdieu, 1972) has been applied to the study of career decision-making (Vilhjálmsson & Arnkelsson, 2003, 2013). *Habitus* may enrich thinking about volition and its position within the SCCT model and hypotheses regarding outcome expectations being moderated by external sources such as cultural assumptions and the meanings of outcomes.

Although the SCCT is used here to exemplify the potential of vocational psychology, there are other theories and practical interventions that could do so quite effectively. What matters most is that these theories and interventions have to be translated into the domain of agriculture.

Reflexively Closing a Loop

The STF is also an analytic framework for researchers' reflexivity (McMahon & Watson, 2007), whereby researchers may reflect on their work within the context of systems of career influences. Like all researchers, I am embedded in a complex arrangement of career influences. Accordingly, by using the STF as an analytic tool, I am able to reflect on my reasoning for proposing a research agenda for the VPA—FFF. Considered objectively, my articulation of the research agenda for VPA—FFF makes sense in the context of my employer's commitment to world-class research into agriculture, which is adjudged according to the standards of the Australian Government's Excellence in Research for Australia (ERA) regime for all universities. The VPA—FFF also makes sense with respect to personal choices to reside and raise a family in a geographic region that is noted for its primary industries sector, and a

Note. This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development, 24*(3), 157-165. doi: 10.1177/1038416215586005

city with educational institutions that have served the region for more than a century. It also makes sense as another chapter in the story of rural, working class boy “made good” (McIlveen, 2007; McIlveen et al., 2010).

The STF is morally and ethically inert, however. It is an epistemological framework, but it is silent on the morals and ethics for any one approach to research and practice. It is not axiological; it does not stipulate which knowledge is of more worth and what is to be valued. By its very design, the STF must be relativist so as to accommodate all of the process, content, and process and content theories. This is not a flaw, however; it is merely a epistemological quality of the STF being a framework that can be used to organise and integrate different theories.

What inspires me to pursue the VPA—FFF is ethical; it is an ethical stance borne in the *psychology of working* (Blustein, 2006, 2013a). That vocational psychology can contribute to the MDGs is a lofty vision and an ethical stance. Assuring vocational psychology’s relevance to the contemporary world underpins this vision.

Conclusion

This paper is the strategic blueprint for the VPA—FFF. Through this new endeavour, vocational psychology can further demonstrate its relevance to society at large by contributing to the production of goods that meet basic human needs. Just as it once contributed solutions to the great social problems associated with the Western world’s transition from an agrarian to industrial society, writ large with notorious innovators such as Frank Parsons (Savickas & Baker, 2005), it is precisely at this historical juncture, at a time when the world needs talented labour in agriculture, that vocational psychology can make a significant contribution to society through its

Note. This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development*, 24(3), 157-165. doi: 10.1177/1038416215586005

science and professional practices. The rationale for the VPA—FFF is unequivocal; vocational psychology can and should contribute to supporting humanity in a most fundamental way; that is, to support the production of food and clothing. The theoretical framework for the research agenda—the STF—is sufficiently complex to serve as a paradigm to enable interdisciplinary research. This agenda signals vocational psychology's return to the field.

Acknowledgments

Former editor of the journal, Professor Wendy Patton, independently reviewed this manuscript. My thanks go to Professor David Blustein and Dr Harsha Perera for their comments on an earlier version of this manuscript.

Note. This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development*, 24(3), 157-165. doi: 10.1177/1038416215586005

References

- Ahmann, J. S. (1955). An application of Fisher's discriminant function in the classification of students. *Journal of Educational Psychology*, *46*(3), 184-188. doi: 10.1037/h0043460
- Austin, E. J., Deary, I. J., & Willock, J. (2001). Personality and intelligence as predictors of economic behaviour in Scottish farmers. *European Journal of Personality*, *15*(S1), S123-S137. doi: 10.1002/per.421
- Australian Bureau of Statistics. (2012). Year book Australia 2012 (catalogue number: 1301.0): Agricultural environment. Retrieved 20 March, 2015, from <http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/1301.0~2012~Main%20Features~Agricultural%20environment~259>
- Blustein, D. L. (2006). *The psychology of working: A new perspective for career development, counseling, and public policy*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Blustein, D. L. (2008). The role of work in psychological health and well-being: A conceptual, historical, and public policy perspective. *American Psychologist*, *63*(4), 228-240. doi: 10.1037/0003-066x.63.4.228
- Blustein, D. L. (2013a). The psychology of working: A new perspective for a new era. In D. L. Blustein (Ed.), *The Oxford handbook of the psychology of working* (pp. 3-18). New York, NY: Oxford University Press.
- Blustein, D. L. (Ed.). (2013b). *The Oxford handbook of the psychology of working*. New York, NY: Oxford University Press.
- Blustein, D. L., Kozan, S., Connors-Kellergren, A., & Rand, B. (2015). Social class and intervention. In P. J. Hartung, M. L. Savickas & W. B. Walsh (Eds.), *APA handbook of career intervention, Volume 1: Foundations* (pp. 243-258). Washington, DC, US: American Psychological Association.
- Blustein, D. L., McWhirter, E. H., & Perry, J. C. (2005). An emancipatory communitarian approach to vocational development theory, research, and practice. *The Counseling Psychologist*, *33*(2), 141-179. doi: 10.1177/0011000004272268
- Blustein, D. L., Schultheiss, D. E. P., & Flum, H. (2004). Toward a relational perspective of the psychology of careers and working: A social constructionist analysis. *Journal of Vocational Behavior*, *64*(3), 423-440. doi: <http://dx.doi.org/10.1016/j.jvb.2003.12.008>
- Bourdieu, P. (1972). *Outline of a theory of practice* (R. Nice, Trans.). Cambridge, UK: Cambridge University Press.
- Brayfield, A. H., & Marsh, M. M. (1957). Aptitudes, interests, and personality characteristics of farmers. *Journal of Applied Psychology*, *41*(2), 98-103. doi: 10.1037/h0043236
- Burton, R. J. F., & Wilson, G. A. (2006). Injecting social psychology theory into conceptualisations of agricultural agency: Towards a post-productivist farmer self-identity? *Journal of Rural Studies*, *22*(1), 95-115. doi: <http://dx.doi.org/10.1016/j.jrurstud.2005.07.004>
- Burt, H. E., & Ives, F. W. (1923). Vocational tests for agricultural engineers. *Journal of Applied Psychology*, *7*(2), 178-187. doi: 10.1037/h0074417
- Byars-Winston, A., Estrada, Y., Howard, C., Davis, D., & Zalapa, J. (2010). Influence of social cognitive and ethnic variables on academic goals of underrepresented
- Note.* This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development*, *24*(3), 157-165. doi: 10.1177/1038416215586005

- students in science and engineering: A multiple-groups analysis. *Journal of Counseling Psychology*, 57(2), 205-218. doi: 10.1037/a0018608
- Campbell, D. P., & Holland, J. L. (1972). A merger in vocational interest research: Applying Holland's theory to Strong's data. *Journal of Vocational Behavior*, 2(4), 353-376. doi: [http://dx.doi.org/10.1016/0001-8791\(72\)90012-7](http://dx.doi.org/10.1016/0001-8791(72)90012-7)
- Casper, W. J., & Swanberg, J. E. (2011). Career and work concerns of diverse and understudied workers. *Journal of Vocational Behavior*, 79(3), 611-612. doi: <http://dx.doi.org/10.1016/j.jvb.2011.05.006>
- Cordero, E. D., Porter, S. H., Israel, T., & Brown, M. T. (2010). Math and science pursuits: A self-efficacy intervention comparison study. *Journal of Career Assessment*, 18(4), 362-375. doi: 10.1177/1069072710374572
- Diemer, M. A., & Rasheed, A. S. (2009). Integrating social class into vocational psychology: Theory and practice implications. *Journal of Career Assessment*, 17(3), 247-265. doi: 10.1177/1069072708330462
- Duffy, R. D., Diemer, M. A., Perry, J. C., Laurenzi, C., & Torrey, C. L. (2012). The construction and initial validation of the Work Volition Scale. *Journal of Vocational Behavior*, 80(2), 400-411.
- Eden, D., & Leviatan, U. (1974). Farm and factory in the kibbutz: A study in agrico-industrial psychology. *Journal of Applied Psychology*, 59(5), 596-602. doi: 10.1037/h0037327
- Esters, L. T. (2007). Career indecision levels of students enrolled in a college of agriculture and life sciences. *Journal of Agricultural Education*, 48(4), 130-146. doi: 10.5032/jae.2007.04130
- Esters, L. T. (2008). Influence of career exploration process behaviors on agriculture students' level of career certainty. *Journal of Agricultural Education*, 49(3), 23-33. doi: 10.5032/jae.2008.01006
- Esters, L. T., & Bowen, B. E. (2005). Factors influencing career choices of urban agricultural education students. *Journal of Agricultural Education*, 46(2), 24-35. doi: 10.5032/jae.2005.02024
- Esters, L. T., & McCulloh, R. E. (2008). Career exploratory behaviors of postsecondary agriculture students. *Journal of Agricultural Education*, 49(1), 6-16. doi: 10.5032/jae.2008.01006
- Farming and Agricultural Organization of the United Nations. (2010). Breaking the rural poverty cycle: Getting girls and boys out of work and into school. <http://www.fao.org/docrep/013/i2008e/i2008e07.pdf>
- Flores, L. Y. (2013). Race and working. In D. L. Blustein (Ed.), *The Oxford handbook of the psychology of working* (pp. 71-84). New York, NY: Oxford University Press.
- Food and Agriculture Organization of the United Nations. (2014a). *FAO statistical year book 2014. Asia and the Pacific: Food and agriculture*. Retrieved from <http://www.fao.org/3/a-i3590e.pdf>
- Food and Agriculture Organization of the United Nations. (2014b). *Food and nutrition numbers 2014*. Retrieved from <http://www.fao.org/3/a-i4175e.pdf>
- Food and Agriculture Organization of the United Nations. (2014c). *Towards stronger family farms. Voices in the International Year of Family Farming*. Retrieved from <http://www.fao.org/3/a-i4171e.pdf>
- Food and Agriculture Organization of the United Nations. (2015). About FAO. Retrieved 18 March, 2015, from <http://www.fao.org/about/en/>
- Note.* This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development*, 24(3), 157-165. doi: 10.1177/1038416215586005

- Fugate, M., Kinicki, A. J., & Ashforth, B. E. (2004). Employability: A psycho-social construct, its dimensions, and applications. *Journal of Vocational Behavior*, 65(1), 14-38. doi: DOI: 10.1016/j.jvb.2003.10.005
- Gagné, M., & Deci, E. L. (2005). Self-determination theory and work motivation. *Journal of Organizational Behavior*, 26(4), 331-362. doi: 10.1002/job.322
- Glick, P. (1964). Preliminary trial of a three-dimensional classification of occupations. *Journal of Counseling Psychology*, 11(1), 95-97. doi: 10.1037/h0038527
- Greiner, R., & Gregg, D. (2011). Farmers' intrinsic motivations, barriers to the adoption of conservation practices and effectiveness of policy instruments: Empirical evidence from northern Australia. *Land Use Policy*, 28(1), 257-265. doi: <http://dx.doi.org/10.1016/j.landusepol.2010.06.006>
- Greiner, R., Patterson, L., & Miller, O. (2009). Motivations, risk perceptions and adoption of conservation practices by farmers. *Agricultural Systems*, 99(2-3), 86-104. doi: <http://dx.doi.org/10.1016/j.agsy.2008.10.003>
- Grigg, A. E. (1948). A Farm Knowledge test. *Journal of Applied Psychology*, 32(5), 452-455. doi: 10.1037/h0054644
- Hall, D. T., & Mirvis, P. H. (2013). Redefining work, work identity, and career success. In D. L. Blustein (Ed.), *The Oxford handbook of the psychology of working* (pp. 203-217). New York, NY: Oxford University Press.
- Heppner, P. P., Cook, S. W., Strozier, A. L., & Heppner, M. J. (1991). An investigation of coping styles and gender differences with farmers in career transition. *Journal of Counseling Psychology*, 38(2), 167-174. doi: 10.1037/0022-0167.38.2.167
- International Labour Office. (2013). *Marking progress against child labour: Global estimates 2000-2012*. Retrieved from http://www.ilo.org/wcmsp5/groups/public/---ed_norm/---ipecc/documents/publication/wcms_221513.pdf
- Kuehne, G. (2013). My decision to sell the family farm. *Agriculture and Human Values*, 30(2), 203-213. doi: 10.1007/s10460-012-9393-7
- Lee, H.-S., Flores, L. Y., Navarro, R. R., & Kanagui-Muñoz, M. (2015). A longitudinal test of social cognitive career theory's academic persistence model among Latino/a and White men and women engineering students. *Journal of Vocational Behavior*, 88, 95-103. doi: <http://dx.doi.org/10.1016/j.jvb.2015.02.003>
- Lent, R. W., & Brown, S. D. (2006). Integrating person and situation perspectives on work satisfaction: A social-cognitive view. *Journal of Vocational Behavior*, 69(2), 236-247. doi: <http://dx.doi.org/10.1016/j.jvb.2006.02.006>
- Lent, R. W., & Brown, S. D. (2013). Social cognitive model of career self-management: Toward a unifying view of adaptive career behavior across the life span. *Journal of Counseling Psychology*, 60(4), 557-568. doi: 10.1037/a0033446
- Lent, R. W., Brown, S. D., & Hackett, G. (2000). Contextual supports and barriers to career choice: A social cognitive analysis. *Journal of Counseling Psychology*, 47(1), 36-49. doi: 10.1037/0022-0167.47.1.36
- Lent, R. W., Brown, S. D., Sheu, H.-B., Schmidt, J., Brenner, B. R., Gloster, C. S., . . . Treistman, D. (2005). Social cognitive predictors of academic interests and

Note. This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development*, 24(3), 157-165. doi: 10.1177/1038416215586005

- goals in engineering: Utility for women and students at historically black universities. *Journal of Counseling Psychology*, 52(1), 84.
- Lent, R. W., Miller, M. J., Smith, P. E., Watford, B. A., Hui, K., & Lim, R. H. (2015). Social cognitive model of adjustment to engineering majors: Longitudinal test across gender and race/ethnicity. *Journal of Vocational Behavior*, 86, 77-85.
- Liu, W. M., & Ali, S. A. (2005). Addressing social class and classism in vocational theory and practice: Extending the emancipatory communitarian approach. *The Counseling Psychologist*, 33(2), 189-196. doi: 10.1177/0011000004272269
- Lowder, S. K., Skoet, J., & Sing, S. (2014). *What do we really know about the number and distribution of farms and family farms in the world? Background paper for The State of Food and Agriculture 2014*. Retrieved from <http://www.fao.org/docrep/019/i3729e/i3729e.pdf>
- Mahoney, K. T., & Baker, D. B. (2007). The measure of a nation: The USDA and the rise of survey methodology. *Journal of Vocational Behavior*, 71(1), 97-113. doi: <http://dx.doi.org/10.1016/j.jvb.2007.03.005>
- Mann, S. (2007). Tracing the process of becoming a farm successor on Swiss family farms. *Agriculture and Human Values*, 24(4), 435-443. doi: 10.1007/s10460-007-9087-8
- Maybery, D., Crase, L., & Gullifer, C. (2005). Categorising farming values as economic, conservation and lifestyle. *Journal of Economic Psychology*, 26(1), 59-72. doi: <http://dx.doi.org/10.1016/j.joep.2003.10.001>
- McIlveen, P. (2007). The genuine scientist-practitioner in vocational psychology: An autoethnography. *Qualitative Research in Psychology*, 4(4), 295-311. doi: 10.1080/14780880701522403
- McIlveen, P., Beccaria, G., du Preez, J., & Patton, W. (2010). Autoethnography in vocational psychology: Wearing your class on your sleeve. *Journal of Career Development*, 37(3), 599-615. doi: 10.1177/0894845309357048
- McIlveen, P., Brooks, S., Lichtenberg, A., Smith, M., Torjul, P., & Tyler, J. (2011). Career development learning frameworks for work-integrated learning. In S. Billett & A. Henderson (Eds.), *Developing learning professionals: Integrating experiences in university and practice settings* (pp. 149-165). Dordrecht, The Netherlands: Springer.
- McMahon, M., & Watson, M. (2007). An analytical framework for career research in the post-modern era. *International Journal for Educational and Vocational Guidance*, 7(3), 169-179. doi: 10.1007/s10775-007-9126-4
- National Farmers' Federation. (2012). *NFF farm facts: 2012*. Retrieved from <http://www.nff.org.au>
- OECD. (2014). *OECD science, technology and Industry outlook 2014*. doi:10.1787/sti_outlook-2014-en
- Patton, W., & McMahon, M. (2014). *Career development and systems theory: Connecting theory and practice*. Rotterdam, The Netherlands: Sense Publishers.
- Pressey, S. L., & Thomas, J. B. (1919). A study of country children in (1) a good and (2) a poor farming district by means of a group scale of intelligence. *Journal of Applied Psychology*, 3(3), 283-286. doi: 10.1037/h0071621

Note. This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development*, 24(3), 157-165. doi: 10.1177/1038416215586005

- Reardon, R., Lenz, J. G., Sampson, J. P., & Peterson, G. W. (2009). *Career development and planning: A comprehensive approach* (3rd ed.). Pacific Grove, CA: Cengage Learning.
- Remmers, H. H. (1929). The measurement of interest differences between students of engineering and of agriculture. *Journal of Applied Psychology*, *13*(2), 105-119. doi: 10.1037/h0074502
- Richards, J. M. (1972). A longitudinal study in a national sample of young farmers in the United States. *Journal of Vocational Behavior*, *2*(2), 179-189. doi: [http://dx.doi.org/10.1016/0001-8791\(72\)90049-8](http://dx.doi.org/10.1016/0001-8791(72)90049-8)
- Richards, J. M. (1973). The psychology of farming: A review of twenty-five years of research. *Journal of Vocational Behavior*, *3*(4), 485-501. doi: [http://dx.doi.org/10.1016/0001-8791\(73\)90060-2](http://dx.doi.org/10.1016/0001-8791(73)90060-2)
- Richards, J. M. (1977). An ecological analysis of the geographic distribution of veterinarians in the United States. *Journal of Vocational Behavior*, *11*(2), 216-231. doi: [http://dx.doi.org/10.1016/0001-8791\(77\)90008-2](http://dx.doi.org/10.1016/0001-8791(77)90008-2)
- Richards, J. M., & Claudy, J. G. (1973). Does farm practice adoption involve a general trait? *Journal of Applied Psychology*, *57*(3), 360-362. doi: 10.1037/h0034705
- Richards Jr, J. M. (1973). The psychology of farming: A review of twenty-five years of research. *Journal of Vocational Behavior*, *3*(4), 485-501. doi: [http://dx.doi.org/10.1016/0001-8791\(73\)90060-2](http://dx.doi.org/10.1016/0001-8791(73)90060-2)
- Richardson, M. S. (2012). A critique of career discourse practices. In P. McIlveen & D. E. Schultheiss (Eds.), *Social constructionism in vocational psychology and career development* (pp. 87-104). Rotterdam, The Netherlands: Sense Publishers.
- Richardson, M. S., & Schaeffer, C. (2013). From work and family to a dual model of working. In D. L. Blustein (Ed.), *The Oxford handbook of the psychology of working* (pp. 141-159). New York, NY: Oxford University Press.
- Savickas, M. L., & Baker, D. R. (2005). The history of vocational psychology: Antecedents, origin, and early development. In M. L. Savickas & W. B. Walsh (Eds.), *Handbook of Vocational Psychology* (pp. 15-50). Mahwah, NJ: Lawrence Erlbaum Associates.
- Schultheiss, D. E. P., Kress, H. M., Manzi, A. J., & Glasscock, J. M. J. (2001). Relational influences in career development: A qualitative inquiry. *The Counseling Psychologist*, *29*(2), 216-241. doi: 10.1177/0011000001292003
- Stain, H. J., Kelly, B., Carr, V. J., Lewin, T. J., Fitzgerald, M., & Fragar, L. (2011). The psychological impact of chronic environmental adversity: Responding to prolonged drought. *Social Science & Medicine*, *73*(11), 1593-1599. doi: <http://dx.doi.org/10.1016/j.socscimed.2011.09.016>
- Stead, G. B. (2004). Culture and career psychology: A social constructionist perspective. *Journal of Vocational Behavior*, *64*(3), 389-406. doi: 10.1016/j.jvb.2003.12.006
- Tolman, R., & Likert, R. (1942). Psychologists' services in the field of agriculture. *Journal of Consulting Psychology*, *6*(2), 65-68. doi: 10.1037/h0057138
- Turner, L. R., & Hawkins, C. (2014). Revised expected outcomes: Essential for attracting Tasmanian students to careers in agricultural science. *Australian Journal of Career Development*, *23*(2), 88-95. doi: 10.1177/1038416214527737
- Note.* This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development*, *24*(3), 157-165. doi: 10.1177/1038416215586005

- United Nations. (2014). *Millennium development goals report 2014*. Retrieved from http://www.undp.org/content/dam/undp/library/MDG/english/UNDP_MDGReport_EN_2014Final1.pdf
- Van den Broeck, A., Vansteenkiste, M., De Witte, H., Soenens, B., & Lens, W. (2010). Capturing autonomy, competence, and relatedness at work: Construction and initial validation of the Work-related Basic Need Satisfaction scale. *Journal of Occupational and Organizational Psychology*, 83(4), 981-1002. doi: 10.1348/096317909X481382
- Vilhjálmsdóttir, G., & Arnelsson, G. B. (2003). The interplay between habitus, social variables and occupational preferences. *International Journal for Educational and Vocational Guidance*, 3(2), 137-150. doi: 10.1023/A:1024760107769
- Vilhjálmsdóttir, G., & Arnelsson, G. B. (2013). Social aspects of career choice from the perspective of habitus theory. *Journal of Vocational Behavior*, 83(3), 581-590. doi: <http://dx.doi.org/10.1016/j.jvb.2013.08.002>
- Watts, A. G. (2006). *Career development learning and employability*. Hestington, UK: The Higher Education Academy.
- Whiston, S. C., & Keller, B. K. (2004). The influences of the family of origin on career development: A review and analysis. *The Counseling Psychologist*, 32(4), 493-568. doi: 10.1177/0011000004265660
- Willock, J., Deary, I. J., McGregor, M. M., Sutherland, A., Edwards-Jones, G., Morgan, O., . . . Austin, E. J. (1999). Farmers' attitudes, objectives, behaviors, and personality traits: The Edinburgh study of decision making on farms. *Journal of Vocational Behavior*, 54(1), 5-36. doi: <http://dx.doi.org/10.1006/jvbe.1998.1642>
- Zekeri, A. A. (1992). Income attainment among land-grant colleges of agriculture alumni. *Journal of Vocational Behavior*, 41(2), 200-206. doi: [http://dx.doi.org/10.1016/0001-8791\(92\)90020-Z](http://dx.doi.org/10.1016/0001-8791(92)90020-Z)

Note. This manuscript is the author version of: McIlveen, P. (2015). A research agenda for the vocational psychology of agriculture. *Australian Journal of Career Development*, 24(3), 157-165. doi: 10.1177/1038416215586005