

Proceedings from the UPEI
Multidisciplinary Graduate Research
Conference

“Emerging Scholars: Illuminating Graduate Research”

Proceedings from the UPEI Multidisciplinary Graduate Research Conference

“Emerging Scholars: Illuminating Graduate Research”

University of Prince Edward Island, Charlottetown, PE, Canada

Edited by
Brittany A. E. Jakubiec
Hannah Gehrels

Preface

The inaugural University of Prince Edward Island (UPEI) Multidisciplinary Graduate Research Conference (UMGRC) was hugely successful. In keeping with the 2015 theme, “Emerging Scholars: Illuminating Graduate Research,” more than 70 graduate students from across Canada were able to showcase their work. More than 300 students, faculty, and staff attended the pre-conference workshops.

Our keynote address was delivered by Dr. Theresa Bernardo, former associate professor at Michigan State University and now the IDEXX Chair in Emerging Technologies and Bond-Centered Animal Healthcare at the University of Guelph. Dr. Bernardo is UPEI’s first graduate student, graduating with an MSc degree in 1989 from the Atlantic Veterinary College. In 2012, Dr. Bernardo was presented with the UPEI Distinguished Alumnus Award.

UMGRC 2015 Planning Committee:

Brittany A. E. Jakubiec, Valerie Campbell, Hannah Gehrels (UPEI graduate students and co-chairs); Dr. Jane Preston (Faculty of Education, UPEI), Dr. Brian Wagner (Department of Chemistry, UPEI), Dr. Pedro Quijon (Department of Biology, UPEI), Grace McCourt (School of Business), Dr. Colleen MacQuarrie (Department of Psychology, UPEI), and Dr. Laurie Brinklow (Island Studies, UPEI)

The conference was supported by:

Dr. Robert Gilmour (UPEI), the Faculty of Education (UPEI), the Atlantic Veterinary College, the Department of Student Affairs (UPEI), the Office of the Vice President Academic, the School of Sustainable Design Engineering, the School of Business, the Faculty of Science, the International Relations Office, the UPEI Bookstore, and the Master of Nursing program

Table of Contents

Preface

Planning Committee

Support and Contributions

Abdulmajeed, A. M. and Qaderi, M. M.

Aerobic methane emissions from pea plants grown and incubated under various conditions 1

Gehrels, H., Cox, R., and Quijon, P.

Science-informed policies: How matrix modelling can help invasion management decisions 10

Jalbert, P.

Understanding dynamics: A relational model's insight 15

Khatibsemnani, N.

Adopting an intersectional framework in the study of immigrant women's health 21

Liu, H. Y.

Economic immigrant parents in Prince Edward Island: Their involvement in education 26

Ma, Y.

A generative study on causative derivation in Mandarin Chinese 31

MacPhee, M. M.

Parents' perspectives: Non-Francophone parents of children in Francophone schools 36

Neville-MacLean, S.

Chinese EAP students' perceptions of challenges during the transition period 41

Onifade, T. T.

From risk analysis to risk governance: The case study of the Ebola Virus Disease 47

Roy, S.

Students' agentic engagement within project-based learning 56

Simon, A.

Shifting paradigms: Variation and leitmotifs in the Final Fantasy XIII trilogy 61

Tanfara, K.

An interpretative phenomenological analysis of the experiences of students requiring tertiary level behavior support within inclusive high school settings 67

Yan, Y.

Perspectives of large-scale assessment on Prince Edward Island

74

AEROBIC METHANE EMISSIONS FROM PEA PLANTS GROWN AND INCUBATED UNDER VARIOUS CONDITIONS

Awatif M. Abdulmajeed

Dalhousie University, Nova Scotia, Canada

*Mirwais M. Qaderi**

Dalhousie University, Nova Scotia, Canada

Mount Saint Vincent University, Nova Scotia, Canada

Abstract

Recent studies have shown that stressed plants emit methane (CH₄). However, there has been little information regarding the effects of multiple environmental factors on CH₄ emissions. We determined CH₄ emission from plants grown and incubated under different conditions. Pea (*Pisum sativum*) plants were grown under two temperatures (22/18°C and 28/24°C), two UVB levels [0 and 5 kJ m⁻² d⁻¹] and two watering regimes (well watered and water stressed). Leaves from each condition were incubated under lower temperature at UVB0, lower temperature at UVB5, higher temperature at UVB0 and higher temperature at UVB5. Methane emissions were highest from plants grown under higher temperature than plants grown under lower temperature. However, there were no significant differences in CH₄ emissions among incubation conditions.

Keywords: Aerobic methane emission, environmental factors, high temperature, ultraviolet-B radiation, water stress.

*Corresponding author: Mirwais M. Qaderi, PhD; Department of Biology; Mount Saint Vincent University; Halifax, NS, Canada B3M 2J6; Email: mirwais.qaderi@msvu.ca.

INTRODUCTION

Besides water vapour, carbon dioxide (CO₂) and nitrous oxide, methane (CH₄) is one of the important greenhouse gases in the Earth's atmosphere contributing to global warming (Lowe, 2006). Methane is approximately 28 times more effective on a per molecule basis than CO₂ in trapping heat (Myhre et al., 2013). It has been known for decades that the synthesis of CH₄ is carried out by microorganisms in anaerobic environments (Baker-Blocker, Donahue, & Mancy, 1977). In 2006, Keppler, Hamilton, Braß, and Röckmann discovered for the first time that living plants can also emit CH₄ under aerobic conditions, and such a source may have important implications for the global CH₄ budget. Further studies confirmed this new finding (Wang et al., 2009; Bruhn, Møller, Mikkelsen, & Ambus, 2012). Different sources of aerobic CH₄ production in plants have been suggested. Keppler et al. (2006) suggested that aerobic CH₄ emission may result from the methoxyl groups of cell wall pectin. Vigano, Weelden, Holzinger, Keppler, and Röckmann (2008) suggested cellulose and lignin as sources of aerobic CH₄, in addition to pectin. Bruhn, Mikkelsen, Rolsted, Egsgaard, and Ambus (2014) suggested wax, and most recently Lenhart, Althoff, Greule, and Keppler (2015) suggested methionine as sources of aerobic CH₄ in plants.

Over the past few decades there have been reports of changes in the climatic and environmental conditions of Earth. Global climate change includes increased atmospheric greenhouse gases, higher temperature, alteration in precipitation patterns, and enhanced UVB radiation (Sullivan & Teramura, 1994). The air temperature is projected to increase by 1.1 - 6.4°C by the end of this century (Myhre et al., 2013), and this may lead to drought conditions in some parts of the world (Naumburg, Loik, & Smith, 2004). Also, ozone depletion by anthropogenic gases, such as chlorofluorocarbons, has increased the amount of solar UVB radiation (280-320 nm) reaching the Earth's surface (McKenzie, Bjorn, Bais, & Ilyasad, 2003). Moreover, the use of fertilizer for agricultural practices increased atmospheric concentration of nitrous oxide, which is a major greenhouse gas contributing to global climate change (Khalil, Rasmussen, & Shearer, 2002) and ozone depletion (Wang et al., 2014).

Environmental factors, such as temperature, light intensity, elevated UVB radiation and drought, affect growth and physiological processes of plants, which may experience various stress factors. For example, it was reported that leaves exposed to direct sunlight released, on average, three times more CH₄ than leaves kept in darkness (Butenhoff & Khalil, 2007). Earlier studies have shown that UVB radiation (McLeod et al., 2008; Qaderi & Reid, 2009), higher temperatures (Ghaffarian, 2008; Vigano et al., 2008), water stress (Qaderi & Reid, 2009) and physical injury (Wang et al., 2009) can increase aerobic CH₄ emissions. However, very few studies have considered the effects of incubation conditions on CH₄ emissions from plants (Qaderi & Reid, 2014).

The objective of this study was to investigate the interactive effects of temperature, UVB radiation and watering regime on CH₄ emissions from pea plants grown under two temperatures, two UVB levels, and two watering regimes, and incubated under four conditions of temperature and UVB radiation. We hypothesized that stress factors during plant growth increase CH₄ emission, which varies with incubation condition.

MATERIALS AND METHODS

Seeds of pea (*Pisum sativum* cv. UT234 Lincoln, Stokes Seeds Ltd, Thorold, ON, Canada), were used in this experiment. Seeds were germinated for one week on a mixture of Perlite: Vermiculite: Peat moss (1:1:2), and modified Hoagland's solution was used as fertilizer. Plants were placed in controlled-environment growth chambers under the following conditions: temperature (24/20°C, 16 h day/8h night), photoperiod (16 h, photosynthetic photon flux density of 300 $\mu\text{mol m}^{-2} \text{s}^{-1}$), and relative humidity (~65%). At least 16 one-week-old plants were placed under each of two temperature regimes (22/18°C and 28/24°C; 16 h day/8 h night), and each chamber (each temperature regime) was supplied with two levels of biologically effective UVB radiation [0 and 5 (supplemental) $\text{kJ m}^{-2} \text{d}^{-1}$] for 2 weeks. For each UVB treatment, half of the plants was watered to field capacity (well watered), which was determined by the excess water drainage, and the other half was watered at wilting point (water stressed), which was determined by the sign of leaf wilting. UVB radiation was supplied by four fluorescent lamps (UVB 313EL, Q-Panel, Cleveland, OH), which were placed on the top of a wooden frame that was transversely partitioned into two compartments with barriers of white cardboard. The lamps were pre-burned for 96 h to stabilize the UVB output, and each lamp was wrapped in two layers of 0.127 mm cellulose diacetate film (Grafix Plastics, Cleveland, OH, USA) to filter radiation below 280 nm. Daily UVB radiation was for 8 hours around noon. Then, leaves from each condition were incubated under four experimental conditions: lower temperature at UVB0, lower temperature at UVB5, higher temperature at UVB0, and higher temperature at UVB5.

Determination of aerobic methane emission

From each condition, leaves of three-week-old plants were detached, placed into syringes and incubated for 2 hours inside the growth chamber under four conditions: lower temperature at UVB0, lower temperature at UVB5, higher temperature at UVB0, and higher temperature at UVB5. Qaderi and Reid (2009) reported that 2 h incubation was sufficient to detect CH_4 emission from plant tissue. Qaderi and Reid (2014) also reported that CH_4 emission rate was higher for capsules of stinkweed (*Thlaspi arvense*) incubated at low light intensity than those capsules incubated in darkness, leading us to incubate our samples under light condition for 2 h. From each syringe, 1 mL of gas was collected and injected manually onto a gas chromatograph-flame ionization detector (GC-FID; Varian 3900 Gas Chromatograph; Varian Canada, Mississauga, ON) equipped with a capillary column (Carboxen 1006 PLOT, 30 m x 0.53 mm ID, Supelco, Bellefonte, PA, USA). The injector and detector temperatures were set at 200 and 230°C, respectively. Helium was used as a carrier gas at 10 mL min^{-1} . Methane was eluted with the following programmed temperature gradient: 1 min isothermal heating at 35°C followed by a 24°C min^{-1} oven ramp to 225°C until the end of the 9 min run. Methane was identified by the retention time of the analyte (~2.6 min), using external standard (Air Liquide, Dartmouth, Nova Scotia, Canada), and quantified on the basis of standard curve derived from the injection of pure CH_4 gas (Qaderi & Reid, 2011). The rates of CH_4 emission ($\text{ng g}^{-1} \text{DM h}^{-1}$) were calculated on the basis of leaf dry mass by drying the samples at 60°C for 96 h. Each treatment had at least three replications. Scheffé's multiple-comparison procedure was employed to determine differences between treatments at the 5% level (SAS Institute, 2011).

RESULTS

In pea plants, aerobic CH₄ emission was significantly affected by growth temperature. However, it was marginally affected by incubation conditions (see Table 1).

Table 1

Analysis of variance for effects of temperature, UVB radiation and watering regimes on methane emissions from pea (Pisum sativum) plants grown and incubated under various conditions

Treatment	df	Methane	
		F	P
Temperature (T)	1	16.13	<0.0001
UVB radiation (U)	1	0.13	0.7217
Watering regime (W)	1	0.03	0.8685
Incubation condition (I)	3	2.73	0.0463
T x U	1	0.04	0.8347
T x W	1	0.25	0.6183
T x I	3	0.43	0.7350
U x W	1	0.00	0.9902
U x I	3	0.40	0.7521
W x I	3	0.64	0.5882
T x U x W	1	0.00	0.9782
T x U x I	3	0.61	0.6097
T x W x I	3	0.34	0.7931
U x W x I	3	0.75	0.5224
T x U x W x I	3	0.71	0.5462
Error	132		

Higher temperature significantly increased ($61.86 \pm 1.92_{SE} \text{ ng g}^{-1} \text{ DM h}^{-1}$) CH₄ emission than lower temperature ($49.76 \pm 1.91_{SE} \text{ ng g}^{-1} \text{ DM h}^{-1}$) (Fig. 1A). Methane emission rate was highest from leaves of plants grown under higher temperature and lowest from leaves of plants grown under lower temperature, regardless of UVB levels (Fig. 2A). Methane emission rate was marginally higher for the leaves incubated under lower temperature ($58.82 \pm 1.98_{SE} \text{ ng g}^{-1} \text{ DM h}^{-1}$) than for the leaves incubated under higher temperature ($51.39 \pm 1.97_{SE} \text{ ng g}^{-1} \text{ DM h}^{-1}$). On the basis of one-way ANOVA, however, there were no significant differences in CH₄ emissions among incubation conditions (Figs. 2B & 3).

Figure 1

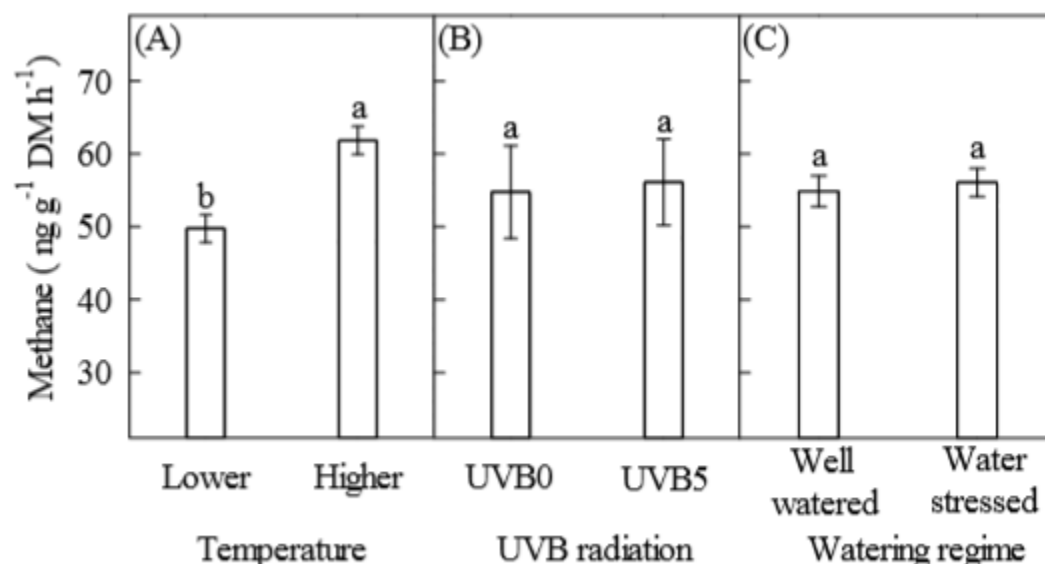


Figure 1. Methane emission rates from three-week-old pea (*Pisum sativum*) plants. Plants were grown under two temperatures (22/18°C and 28/24°C), two levels of UVB radiation [0 and 5 kJ m⁻² d⁻¹] and two watering regimes (well watered and water stressed), after one week of initial growth under lower temperature. Then, plants were incubated under four conditions for 2 hours. (A) temperature, (B) UVB radiation, and (C) watering regimes. Bars (mean ± SE) surmounted by different letters within each panel are significantly different ($P < 0.05$) according to Scheffé's multiple-comparison procedure.

Figure 2

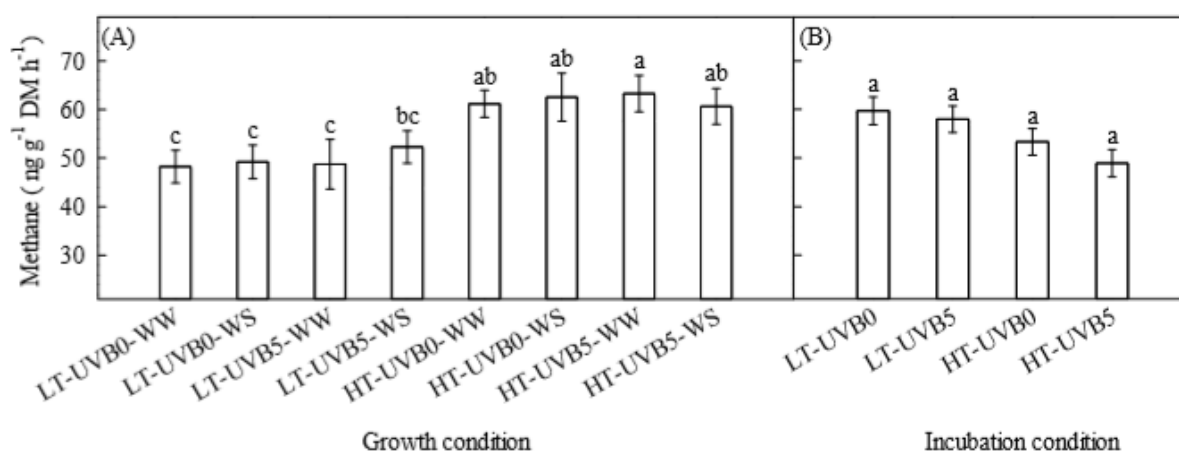


Figure 2. Methane emission rates from three-week-old pea (*Pisum sativum*) plants. Plants were grown under two temperatures (22/18°C and 28/24°C), two levels of UVB radiation [0 and 5 kJ m⁻² d⁻¹] and two watering regimes (well watered and water stressed), after one week of initial growth under lower temperature. Then, plants were incubated under four conditions for 2 hours. (A) growth conditions, and (B) incubation conditions. LT, lower temperature; HT, higher temperature; UVB0, 0 kJ m⁻² d⁻¹ UVB; UVB5, 5 kJ m⁻² d⁻¹ UVB; WW, well watered; WS, water stressed. Bars (mean ± SE) surmounted by different letters within each panel are significantly different ($P < 0.05$) according to Scheffé's multiple-comparison procedure.

Figure 3

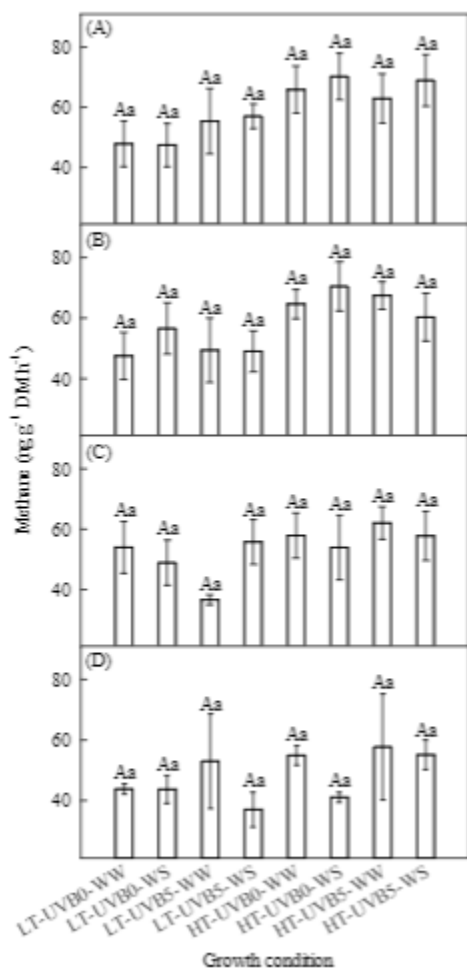


Figure 3. Methane emission rates from three-week-old pea (*Pisum sativum*) plants. Plants were grown under eight experimental conditions and then incubated under four conditions for 2 hours. Incubation conditions: (A) lower temperature at UVB0, (B) lower temperature at UVB5, (C) higher temperature at UVB0, and (D) higher temperature at UVB5. Bars (mean \pm SE) surmounted by different upper-case letters among incubation conditions (within column) or by different lower-case letters within incubation condition (within row) are significantly different ($P < 0.05$) according to Scheffé's multiple-comparison procedure. For acronyms see Figure 2.

DISCUSSION

In our study, plants grown under higher temperatures had highest CH₄ emission rates, whereas plants grown under lower temperatures had lowest emissions, regardless of UVB levels (Figs. 1A & 2A). This suggests that higher temperature might have caused damage to DNA (Stapleton & Walbot, 1994). As suggested, methyl ester groups of pectin might have been a source of CH₄, and reactive oxygen species could have a potential role in CH₄ formation in plants (McLeod et al., 2008).

There were no significant differences among incubation conditions, although the rate of CH₄ emission was marginally higher for leaves incubated under lower temperature, irrespective of UVB levels (Fig. 3). This suggests that higher temperature influences

evaporation/transpiration from plant material inside the syringe that leads to dissolve of CH₄ in the water vapour, resulting in lower concentration. It is known that methane can physically combine with water under the proper temperature and pressure conditions (Servio & Englezos, 2002). Conversely, when the leaves were incubated under lower temperature, the concentration of CH₄ remained unchanged and thus was higher than leaves incubated under higher temperature.

In summary, temperature, but not UVB or water stress, significantly affected CH₄ emission, which was higher from the leaves of plants grown under higher temperatures than from the leaves of plants grown under lower temperatures. Overall, the lower incubation temperature marginally increased CH₄ emission, but it was not significantly different among incubation conditions. We conclude that growth conditions have critical role in aerobic CH₄ emissions from plants.

ACKNOWLEDGEMENT

We thank Natural Sciences and Engineering Research Council (NSERC) of Canada for financial support through a Discovery grant and Mount Saint Vincent University for an Internal Research grant to MMQ. A graduate scholarship from Saudi Arabia Ministry of Higher Education to AMA is greatly acknowledged. We also thank John Pirkins for helping with the construction of frames for UVB lamps.

REFERENCES

- Baker-Blocker, A., Donahue, T. M., & Mancy, K. H. (1977). Methane flux from wetlands areas. *Tellus*, *29*, 245–250.
- Bruhn, D., Møller, I. M., Mikkelsen, T. N., & Ambus, P. (2012). Terrestrial plant methane production and emission. *Physiologia Plantarum*, *144*, 201–209.
- Bruhn, D., Mikkelsen, T. N., Rolsted, M. M. M., Egsgaard, H., & Ambus, P. (2014). Leaf surface wax is a source of plant methane formation under UV radiation and in the presence of oxygen. *Plant Biology*, *16*, 512–516.
- Butenhoff, C. L., & Khalil, M. A. K. (2007). Global methane emissions from terrestrial plants. *Environmental Science and Technology*, *41*, 4032–4037.
- Ghaffarian, A. (2008). Aerobic methane production of tropical plants. *Cantaurus*, *16*, 2–5.
- Keppler, F., Hamilton, J. T. G., McRoberts, W. C., Vigano, I., Braß, M., & Röckmann, T. (2008). Methoxyl groups of plant pectin as precursor of atmospheric methane: evidence from deuterium labelling studies. *New Phytologist*, *178*, 808–814.
- Keppler, F., Hamilton, J. T. G., Braß, M., & Röckmann, T. (2006). Methane emissions from terrestrial plants under aerobic conditions. *Nature*, *439*, 187–191.
- Khalil, M. A. K., Rasmussen, R. A., & Shearer, M. J. (2002). Atmospheric nitrous oxide: patterns of global change during recent decades and centuries. *Chemosphere*, *47*, 807–821.
- Lenhart, K., Althoff, F., Greule, M., & Keppler, F. (2015). Technical note: methionine, a precursor of methane in living plants. *Biogeosciences*, *12*, 1907–1914.
- Lowe, D. C. (2006). A green source of surprise. *Nature*, *439*, 148–149.
- McKenzie, R. L., Björn, L. O., Bais, A., & Ilyasad, M. (2003). Changes in biologically active ultraviolet radiation reaching the Earth's surface. *Photochemical & Photobiological Sciences*, *2*, 5–15.
- McLeod, A. R., Fry, S. C., Loake, G. J., Messenger, D. J., Reay, D. S., Smith, K. A., & Yun, B.-W. (2008). Ultraviolet radiation drives methane emissions from terrestrial plant pectins. *New Phytologist*, *180*, 124–132.
- Myhre, G., Shindell, D., Breon, F.-M., Collins, W., Fuglestedt, J., Huang, J., Koch, D., Lamarque, J.-F., Lee, D., Mendoza, B., Nakajima, T., Robock, A., Stephens, G., Takemura, T., & Zhang, H. (2013). Anthropogenic and natural radiative forcing. In: Stocker, T. F., Qin, D., Plattner, G.-K., Tignor, M., Allen, S. K., Boschung, J., Nauels, A., Xia, Y., Bex, V., & Midgley, P. M. (eds) *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, United Kingdom and New York, USA: Cambridge University Press, 659–740.
- Naumburg, E., Loik, M. E., & Smith, S. D. (2004). Photosynthetic responses of *Larrea tridentata* to seasonal temperature extremes under elevated CO₂. *New Phytologist*, *162*, 323–330.
- Qaderi, M. M., & Reid, D. M. (2009). Methane emissions from six crop species exposed to three components of global climate change: temperature, ultraviolet-B radiation and water stress. *Physiologia Plantarum*, *137*, 139–147.
- Qaderi, M. M., & Reid, D. M. (2011). Stressed crops emit more methane despite the mitigating effects of elevated carbon dioxide. *Functional Plant Biology*, *38*, 97–105.
- Qaderi, M. M., & Reid, D. M. (2014). Aerobic methane emissions from stinkweed (*Thlaspi arvense*) capsules. *Plant Signaling & Behavior*, *9*, e970095.

- SAS Institute. (2011). *SAS/STAT[®] User's Guide, Version 9.3*. Cary, NC: SAS Institute Inc.
- Servio, P., & Englezos, P. (2002). Measurement of dissolved methane in water in equilibrium with its hydrate. *Journal of Chemical and Engineering Data*, *47*, 87–90.
- Stapleton, A. E., & Walbot, V. (1994). Flavonoids can protect maize DNA from the induction of ultraviolet radiation damage. *Plant Physiology*, *105*, 881–889.
- Sullivan, J. H., & Teramura, A. H. (1994). The effects of UV-B radiation on loblolly pine. 3. Interaction with CO₂ enhancement. *Plant, Cell and Environment*, *17*, 311–317.
- Vigano, I., Weelden, H. V., Holzinger, R., Keppler, F., & Röckmann, T. (2008). Effect of UV radiation and temperature on the emission of methane from plant biomass and structural components. *Biogeosciences*, *5*, 243–270.
- Wang, Z. P., Gulledge, J., Zheng, J. Q., Liu, W., Li, L. H., & Han, X. G. (2009). Physical injury stimulates aerobic methane emissions from terrestrial plants. *Biogeosciences*, *6*, 615–621.
- Wang, W., Tian, W., Dhomse, S., Xie, F., Shu, J., & Austin, J. (2014). Stratospheric ozone depletion from future nitrous oxide increases. *Atmospheric Chemistry and Physics*, *14*, 12967–12982.

SCIENCE-INFORMED POLICIES: HOW MATRIX MODELLING CAN HELP INVASION MANAGEMENT DECISIONS.

Hannah Gehrels

University of Prince Edward Island, Prince Edward Island, Canada

Ruth Cox

University of Prince Edward Island, Prince Edward Island, Canada

Pedro Quijon

University of Prince Edward Island, Prince Edward Island, Canada

Abstract

The management of many species is hampered by inadequate understanding of their population dynamics. Population matrix models may help fulfill this knowledge gap by theoretically estimating the likely response of a population to various management scenarios. A relevant example is the management of invasive species which often includes removal programs that aim to reduce or eradicate the population. Predicting the impacts of these removal strategies is difficult because populations can sometimes respond in unpredictable ways. We examined how matrix models can help predict the best removal strategies by discussing several case studies (e.g. invasive bullfrogs and invasive lionfish), and then outlined how we plan to use matrix models specifically to predict the best management strategies for European green crabs (*Carcinus maenas*).

Keywords: invasive species, population dynamics, matrix models, wildlife management

The management of many species of economic or ecologic importance is hampered by an inadequate understanding of their population dynamics. For example, population models used to estimate stock sustainability for crustacean fisheries are usually based on natural mortality rates, which are poorly understood (Hewitt, 2008). In the context of management, population matrix models, which are theoretical models used to model the size and age composition of populations as a dynamic system, may help to bridge this knowledge gap. For example, these models may estimate the likely response of a population to various management scenarios, helping decision-makers choose the most effective management option.

A relevant application of matrix models is in the management of invasive species which often include removal programs that aim to reduce or eradicate their populations. Predicting the impacts of a removal strategy is difficult, and populations often respond in unpredictable ways. For example, removing adult bullfrogs from a population can result in an unanticipated increase in the number of animals because frog tadpoles are released from cannibalism pressure, and juvenile frogs have access to greater resources through a decrease in competition (Govindarajulu, Altwegg, & Anholt, 2005). Furthermore, many removal strategies are initiated to control populations without knowing whether removal efforts will have any impact on the population and what the direction of that impact will be (eg. Duncombe, 2014). Barbour, Allen, Frazer, & Sherman (2011) provided an example that illustrates how population matrix models can provide relevant, applicable information about removal programs. These authors concluded that monthly removals of 27% of adult lionfish were required in order to reduce these invasive populations. This rate of removal is significantly higher than most lionfish removal programs, and might be too high to be feasible in parts of the lionfish's invaded range like hard bottom communities off the southeastern US coast.

The European green crab (*Carcinus maenas* Linnaeus 1758) is an invasive species that is detrimental to the ecosystems it invades, particularly during the early stages of its invasion and spread. Green crab populations on Prince Edward Island have increased dramatically since they first invaded Atlantic Canada in the late 1990s (Audet, Davis, Miron, & Moriyasu, 2003). Green crabs have been associated with declines of commercially important clam species (Grosholz et al., 2000), are detrimental to eelgrass beds (Malyshev & Quijon, 2011), and are also known to compete with other native crustaceans (Rosson, Williams, Comeau, Mitchell, & Apaloo, 2006). Management is required to control population numbers and prevent further spread of this species.

Many management and mitigation strategies for green crabs have already been considered including use of parasites (Lafferty & Kuris, 1996; Thresher et al., 2000), chemicals (Hanks and Roberts 1961), and selective harvest (Walton 2000; Duncombe, 2014). One alternative control strategy applied in some areas of Atlantic Canada but not yet in Prince Edward Island, is the creation of a green crab fishery. Soft-shelled crab fisheries for the very similar *Carcinus aestuarii* are flourishing in parts of the green crab's native range (Varagnolo, Alfirevic, Hrs-Brenko, & Igic, 1968). The ground work for determining whether a green crab fishery in PEI is logistically and economically feasible has already been started (L. Poirier Pers. Comm.). Ideally, an assessment of how a fishery would impact green crab populations would be an integral part of this initial assessment. We propose that matrix models can be used to identify the best green crab removal strategies in order to mitigate this invader's impacts in Prince Edward Island.

To date, most of the theoretical modelling on green crabs has been focused on range expansion and movement (e.g. Hines, 2004; See & Feist, 2010). These kinds of studies are useful for predicting when or where a species will invade, but are not necessarily how the population will respond to management strategies. Only one study has modelled the possible effects of control strategies on a green crab population (Kanary, Musgrave, Tyson, Locke, & Lutscher, 2014). It is challenging to do long term population research on crustaceans that requires marked individuals (e.g. mark-recapture studies) because they moult regularly and therefore do not retain hard body parts or marks as they grow.

Although very little population modelling and demographic research has been done on green crabs, there seems to be enough (scattered) information on life history traits to provide estimates for most of the parameters needed to build a matrix model. Estimates of fecundity, larval survival, longevity, and size and age at sexual maturity are available in the literature (Audet, Miron, & Moriyasu, 2008; Berrill, 1982; Dawirs, 1985; Sharp et al., 2003; Yamada et al., 2005). However, the natural mortality rate (M), the most substantial parameter needed for a matrix model, has not been explicitly reported and is challenging to estimate for crustaceans. The linear regression model (Hoenig, 1983), where M is based on longevity estimates, seems to be one of the best methods for estimating M for crustaceans (Hewitt, 2008). We will be pairing these parameters from the literature with intensive field surveys at two sites on Prince Edward Island. From May to December, 2015, green crabs were surveyed using minnow traps, fyke nets, and fukui traps, every two weeks. Sex, carapace width, and injuries were recorded for all crabs caught. The combination of data from the literature will be used to create a useful population model, and the field data will help to validate the theoretical model with observational data.

A stage-based population matrix model for green crabs will provide important information about green crab demography. Its development can be used to predict optimal removal strategies and their effects on remaining crab populations, particularly early stages often exposed to cannibalism by large adults (P. Tummon Flynn, personal communication). Specific to Prince Edward Island, information from this model may help drive management decisions of green crabs, especially in relation to the establishment of a soft-shelled green crab fishery. More broadly, once a model has been developed, it may be applied to other locations where selective harvest is already underway in order to gain some understanding about how the selective harvest may be affecting the population as a whole.

REFERENCES

- Audet, D., Davis, D., Miron, G., & Moriyasu, M. (2003). Geographical expansion of a nonindigenous crab, *Carcinus maenas* (L.), along the Nova Scotian shore into the southeastern Gulf of St. Lawrence, Canada. *Journal of Shellfish Research*, 22(1), 255–262.
- Audet, D., Miron, G., & Moriyasu, M. (2008). Biological characteristics of a newly established green crab (*Carcinus maenas*) population in the Southern Gulf of St. Lawrence, Canada. *Journal of Shellfish Research*, 27(2), 427–441. doi:10.2983/0730-8000
- Barbour, A. B., Allen, M. S., Frazer, T. K., & Sherman, K. D. (2011). Evaluating the potential efficacy of invasive lionfish (*Pterois volitans*) removals. *PLoS ONE*, 6(5). doi:10.1371/journal.pone.0019666
- Berrill, M. (1982). The life cycle of the green crab *Carcinus maenas* at the northern end of its range. *Journal of Crustacean Biology*, 2(1), 31–39.
- Dawirs, R. R. (1985). Temperature and larval development of *Carcinus maenas* (Decapoda) in the laboratory; prediction of larval dynamics in the sea. *Marine Ecology Progress Series*, 24, 297–302.
- Duncombe, L. (2014). *Evaluating trapping as a method to control the European green crab, Carcinus maenas, population at Pipestem Inlet, British Columbia, Canada*. MSc. Thesis.
- Govindarajulu, P., Altwegg, R., & Anholt, B. R. (2005). Matrix model investigation of invasive species control: Bullfrogs on Vancouver island. *Ecological Applications*, 15(6), 2161–2170. doi:10.1890/05-0486
- Grosholz, E. D., Ruiz, G. M., Dean, C. A., Shirley, K. A., Maron, J. L., & Connors, P. G. (2000). The impacts of a nonindigenous marine predator in a California bay. *Ecology*, 81(5), 1206–1224.
- Hewitt, D. A. (2008). *Natural mortality of blue crab: Estimation and influence on population dynamis* (Unpublished dissertation). University of William & Mary, Virginia, US.
- Hines. (2004). *Projecting range expansion of invasive European green crabs (Carcinus maenas) to Alaska: Temperature and salinity tolerance of larvae*.
- Kanary, L., Musgrave, J., Tyson, R. C., Locke, A., & Lutscher, F. (2014). Modelling the dynamics of invasion and control of competing green crab genotypes. *Theoretical Ecology*, 7(4), 391–406. doi:10.1007/s12080-014-0226-8
- Lafferty, K. D., & Kuris, A. M. (1996). Biological control of marine pests. *Ecology*, 77(7), 1989–2000.
- Malyshev, A., & Quijon, P. A. (2011). Short communication disruption of essential habitat by a coastal invader : new evidence of the effects of green crabs on eelgrass beds, 68(9), 1852–1856.
- Rosson, M. A., Williams, P. J., Comeau, M., Mitchell, S. C., & Apaloo, J. (2006). Agonistic interactions between the invasive green crab, *Carcinus maenas* (Linnaeus) and juvenile American lobster, *Homarus americanus* (Milne Edwards). *Journal of Experimental Marine Biology and Ecology*, 329(2), 281–288. doi:10.1016/j.jembe.2005.09.007
- See, K. E., & Feist, B. E. (2010). Reconstructing the range expansion and subsequent invasion of introduced European green crab along the west coast of the United States. *Biological Invasions*, 12(5), 1305–1318. doi:10.1007/s10530-009-9548-7
- Sharp, G., Semple, R., Connolly, K., Blok, R., Audet, D., Cairns, D., & Courtenay, S. (2003). *Assessment of the basin head lagoon: A proposed marine protected area*.
- Thresher, R., Werner, M., Høeg, J., Svane, I., Glenner, H., Murphy, N., & Wittwer, C. (2000).

Developing the options for managing marine pests: specificity trials on the parasitic castrator, *Sacculina carcini*, against the European crab, *Carcinus maenas*, and related species. *Journal of Experimental Marine Biology and Ecology*, 254(1), 37–51.

doi:10.1016/S0022-0981(00)00260-4

Yamada, S. B., Dumbauld, B. R., Kalin, A., Hunt, C. E., Figlar-Barnes, R., & Randall, A. (2005). Growth and persistence of a recent invader *Carcinus maenas* in estuaries of the northeastern Pacific. *Biological Invasions*, 7(2), 309–321. doi:10.1007/s10530-004-0877-2

UNDERSTANDING DYNAMICS: A RELATIONAL MODEL'S INSIGHT

Paul Jalbert

Laurentian University, Ontario, Canada

Abstract

I compared traditional action theory to a relational model when trying to understand family interactions using data collected from 5 Canadian families. The results suggest that, at the micro level, the indicators of sociality are explicitly observable in 96.8% of the verbal items while they were implicitly observable in 3.2% of the verbal items. At the macro level, the indicators of sociality were observable in 95.8% of the verbal items, they were not observable in 2.7% of the verbal items and in 1.5% of the items the results were undetermined. This is a significant contribution to the field as it demonstrates in a real world environment that a relational model is more effective in understanding the dynamics of family interactions.

Keywords: relational model, intention, dynamics, rationality, emotion

INTRODUCTION

An expanding body of empirical research suggests that actor centred models for understanding sociological phenomena are limited by their inability to assume the fundamental nature of human interactions (Laflamme, 1995, 2012). Action theory conceives the actor as asocial with five basic pillars: intention, interest, rationality, strategy and consciousness (Girard, 2004; Girard, Laflamme & Roggero, 2005). Yet, these categories do not have the analytical depth to understand interactions as it is focussed on the individual whereas the interaction necessitates, at the very minimum, two (Jalbert, 2006; Rouselle, 2003). However, these individuals do not have to be engaged in an explicit conversation in order to be communicating (Watzlawick, 1967). Their communication is intrinsic to their existence. By existing, they communicate. At the very least, they communicate their existence.

Relational models, on the other hand, have consistently proven their value in understanding the dynamic nature of human interactions (Bouchard, 2000; Girard, 2009). Relational models focus their analysis on the interaction that occur between individuals. They are therefore capable of taking into account that humans are fundamentally communicational, and, by corollary, social in nature. If we accept this as true, we must also accept that these interactions occur in a specific context which cannot be ignored in the analysis. At a micro level, the information that is transmitted during these interactions serve to inform and acts upon the dynamics of the interaction (Rousselle, 2003). At a macro level, the individuals communicate within the larger context of a shared symbolism that is common to both, but also common to a larger group. Finally, if we accept that humans are fundamentally social in nature, we must reject the conceptualisation that would have them as essentially rational. Although humans undoubtedly have a capacity to reason, it does not necessarily follow that they are rational beings. We have a capacity for irrationality, we feel emotion, and emotions are an intrinsic part of the human psyche.

Simon Laflamme proposed a relational model which is based on three analytical categories: sociality, historicity and emoreason (Laflamme, 1995). Sociality can be understood within two levels: the micro and macro. At the micro level, the indicators of sociality can be observed where the communication between individuals is readily understandable by all parties. At the macro level, the indicators of sociality can be observed when the information being exchanged can be understood by the larger group to which the participants belong. The model accepts that our thought process is flexible, capable of rationality and irrationality that is not necessarily rooted in self-interest. These concepts have been verified through a number of empirical studies and their value in understanding the dynamics of human interactions is undeniable (Bouchard, 2000; Girard, 2004, 2009). However, this has to date not been tested in the natural setting. The goal of this research is to accomplish just that.

For the purposes of this paper, we will limit ourselves to verifying 1 of the hypotheses contained in the larger research. We propose that if the relational model is correct in assuming that human beings are essentially social, then we should be able to observe the indicators of sociality at both the micro and macro level.

METHODOLOGY

Data was obtained from 5 Canadian families over the course of a week. Each family was composed of two parents and at least two school aged children for a total of 22 individual participants (there were 2 families of 5). A video camera was installed in a common room in each family's home. The camera was motion activated between 4 pm and 11 pm Monday to Friday and from 9 am to 11 pm on Saturday and Sunday. The data was then transcribed so that an analysis could be completed.

We randomly selected 5 verbal items from each family. A verbal item was defined as an uninterrupted statement made by a person. So if a person was interrupted during their statement and continued on after the interruption that was counted as two verbal items. We then analysed the preceding 10 items and the following ten items for a total of 21 items from each randomly selected verbal items. This gave us an overall total of 525 items to analyse.

We answered yes that the indicator for sociality at the micro level were explicitly observable in the cases where the verbal items between the members of the family were understandable by each other without any additional information. We answered yes for the indicator for sociality at the micro level where they were implicitly observable when, to fully understand the spirit of the conversation, more information would have been required. Next, we coded yes to the indicators for sociality at the macro level when the understanding of the conversation between family members could not be reduced to the family but could be understood by the larger group. We coded undetermined when we did not have sufficient information to make a ruling in the coding. In all other cases, we answered that we were unable to observe the indicators for sociality at the macro level.

RESULTS AND DISCUSSION

We were able to observe explicitly the indicators of sociality at the micro level in 96.2% of the cases. We were able to observe them implicitly in 3.8% of the cases. At the macro level, we were able to observe them in 95.8% of the cases. We were not able to observe them in 2.7% of the cases and in 1.5% of the cases we did not have sufficient information to make a determination.

These observations decisively demonstrate that the indicators of sociality at both the micro and macro level are observable in a real world setting. If this is the case, it makes for a strong argument that humans are fundamentally relational beings and their behaviour cannot be reduced to intention, interest or reason. These results speak to the relational nature of human beings.

CONCLUSION

This data permits us to accept our hypotheses and state unequivocally that the indicators for sociality as predicted by the relational model are observed in the interactions between members of a family in a natural setting. This also validates the premise that humans are essentially communicational and therefore social by nature. This is not a premise that action

theory models can accept and therefore underlines their limitations once again when accounting for the interactions that we observed. Rationality cannot, on its own, account for the interactions observed. It cannot do this because the categories within its models do not have the analytical depth to account for the non-rational behaviours that humans are capable of. Future studies may wish to examine if the interactions of different cultures are more or less “intentional” or explore if there are specific situations that are more or less “intentional.”

REFERENCES

- Anscombe, G. E. M. (1963). *Intention*. (2nd ed.). Oxford, UK: Blackwell.
- Bagaoui, R. (2009). La sociologie relationnelle comme principes structurants et comme théories sociales. *Nouvelles perspectives en sciences sociales. Revue internationale de systémique complexe et d'études relationnelles*, 5(1), 25–29.
- Bouchard, P. (2000). *Contribution à la critique de la rationalité utilitaire : Pour un modèle de remplacement des théories de l'action humaine* (Unpublished master's thesis). Laurentian University, Ontario, Canada.
- Caillé, A. (1994). *Don, intérêt et désintéressement : Bourdieu, Mauss, Platon et quelques autres auteurs*. Paris: Éditions La Découverte
- Caillé, A. (1989). *Critique de la raison utilitaire*. Paris, La Découverte.
- Caillé, A. (1981). La sociologie de l'intérêt est-elle intéressante? *Sociologie du travail*, 23(3), 257–274.
- Caillé, A. (2009). *Théorie antiutilitariste de l'action : fragments d'une théorie générale*. Paris, La découverte.
- Emirbayer, M.. (2007). Manifesto for a relational Sociology. *American Journal of Sociology*, 103(2), 281–317.
- Girard, M. (2004). *Relations humaines et production d'information : l'échange comme objet d'étude d'une approche relationnelle* (Unpublished master's thesis). Laurentian University, Ontario, Canada.
- Girard, M. (2007). Éléments de critique des théories de l'action. *Nouvelles perspectives en sciences sociales. Revue internationale de systémique complexe et d'études relationnelles*, 3(1), 47–60.
- Girard, M. (2009). *Contribution à la critique des théories de l'action. Intention et émoraision* (Unpublished dissertation). Université Toulouse 1 Capitole, France.
- Girard, M., Laflamme, S., & Roggero, P. (2005) L'intention est-elle si universelle que le prétendent les théories de l'action? *Nouvelles perspectives en sciences sociales. Revue internationale de systémique complexe et d'études relationnelles*, 1(2), 115–148.
- Jalbert, P. (2006). Analyse du rôle de l'intention dans les échanges dyadiques. *Nouvelles perspectives en sciences sociales. Revue internationale de systémique complexe et d'études relationnelles*, 2(1), 101–141.
- Laflamme, S. (1995). *Communication et émotion: essai de microsociologie relationnelle*. Paris, Éditions de L'Harmattan.
- Laflamme, S. (2012). Les acteur sociaux et la modélisation phénoménologique. *Revue Canadienne de sociologie*, 49(2), 138–150.
- Laflamme, S., & Bagaoui, R. (2006). Don, raison et émotion. *Revue de l'Institut de sociologie*, 1(2), 201–221.
- Luhman, N. (2010). *Sytèmes sociaux*. Québec, QC: La presse de l'université de Laval.
- Roggero, P. (2006). De la complexité en sociologie : Évolution théoriques, développements méthodologiques et épreuves empiriques d'un projet sociologique. *Mémoire pour l'habilitation à diriger des recherches en Sociologie*. Toulouse.
- Rousselle, J. (2003). *La communication chez les couples : une approche relationnelle* (Unpublished master's thesis). Laurentian University, Ontario, Canada.

Vautier, C. (2008). La longue marche de la sociologie relationnelle. *Nouvelles perspectives en sciences sociales. Revue internationale de systémique complexe et d'études relationnelles*, 4(1), p. 76–106.

Watzlawick, P. (1967). *Pragmatics of human communication: A study of interactional patterns, pathologies, and paradoxes*. New York: W.W. Norton.

ADOPTING AN INTERSECTIONAL FRAMEWORK IN THE STUDY OF IMMIGRANT WOMEN'S HEALTH

Nasim Khatibsemnani
University of Ottawa, Ontario, Canada

Abstract

There is an emerging interest in utilizing an intersectionality perspective to the study of immigrant women's health and wellbeing, which highlights the importance of understanding the complex influences of the intersections of multiple social determinants of health and social locations. Using narrative moments, recounted by an immigrant woman with disability, this paper makes a case for an integrated framework for the study of immigrants' health with the objective of addressing a gap in the literature on intersectionality in the health discipline. The findings have indicated that a number of intersecting factors, mostly social constructs, resulted in health deterioration of the participant and ultimately led to her permanent disability.

Keywords: intersectionality, immigrants' health, disability, social determinants of health, population health

INTRODUCTION

In this paper, by offering intersectionality as a theoretical framework, I argue that such framework, which is grounded in lived experience (Hankivsky & Cormier, 2009), can be considered as an important step in the evolution of immigrant women's health research. Ignoring the complexity of immigrant women's lives and how the experiences of multiple locations affect health, can reify a range of inequities. The paper begins with a brief definition and examination of the social determinants of health. Next it continues with an overview of intersectionality and a discussion of why it is important to integrate an intersectional approach into health research. Then I describe the research activities of this study, present the findings with detailed discussion and close the paper with concluding remarks.

Social Determinants of Health and Intersectionality

Health of individuals and populations are determined by the social determinants of health (SDH). The SDH are:

the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life. These forces and systems include economic policies and systems, development agendas, social norms, social policies and political systems. (World Health Organization, 2015, para. 1)

According to Public Health Agency of Canada (2011), the SDH include healthy child development, biology and genetic endowment, education and literacy, employment/working conditions, gender, income and social status, social support networks, social environments, physical environments, personal health practices and coping skills, health services, and culture.

Intersectionality framework “has the potential to inform the complex interplay of determinants that the Public Health Agency of Canada seeks to bring to its work on population health”, because intersectionality, in terms of SDH, moves beyond the assumption that health outcomes are caused by a number of contributing factors to asserting that, numerous causes interact and impact on health (Hankivsky & Christoffersen, 2008, p. 276).

Intersectionality is also concerned with the mutually reinforcing intersections between different social locations and aspects of identity as well as the complex and multifaceted forms of systemic discrimination at macro level. Its focus on the importance of macro level social-structural factors also “aligns well with contemporary advocacy to consider the substantial effect of factors beyond the level of the individual on health” (Bowleg, 2012, p. 1271). Intersectionality indeed seeks to understand the root causes of illness, which the SDH try to identify and address (Hankivsky & Christoffersen, 2008). As a promising way to address structural forms of inequity, which in turn manifest in health inequities, intersectionality has the potential to complement the fragmented traditional frameworks that are insufficient for understanding of multilevel and multifactorial complexities of health inequities (Dhamoon & Hankivsky, 2011; Hankivsky & Christoffersen, 2008).

Furthermore, one of the central aims of intersectionality is the pursuit of social justice (Wilkinson, 2003) and health, Reid (2007) notes, is a social justice issue. Therefore, “what makes intersectionality so relevant in the context of health determinants is its commitment to

social justice” (Hankivsky & Christoffersen, 2008, p. 278). Moreover, intersectionality is a way of thinking about power and its role in creating and perpetuating the social structures of discrimination and thus thinking about “who is excluded and why, who has access to resources and why” (Morris & Bunjun, 2007, p. 2). In this way, it is consistent with the definition of the SDH which determines the quality and quantity of resources that a society makes available to an individual or a population (Raphael, 2009).

FINDINGS AND DISCUSSION

The data presenting here were drawn from a larger project designed to examine the impact of immigration on the health and wellbeing of Iranian immigrant women residing in Ottawa-Gatineau area. I chose face-to face, in-depth interviews as my data-collection tool and I went through seven interdependent stages of the interview inquiry, suggested by Kvale (2007): Thematizing, designing, interviewing, transcribing, analyzing, verifying, and reporting. As ethical issues are a priority when people are being interviewed, I applied for ethics approval. Once receiving the University of Ottawa Research Ethics Board approval, I began my data gathering. Several strategies for establishing the rigor including member check, audit trail, thick description, collecting and analyzing data concurrently, and reflexivity were utilized.

This paper focuses on the experience of one of the Iranian immigrant women, whom I had the privilege to interview. The participant was a middle-aged woman, residing in Canada for more than 20 years. She had come to Canada with her children and husband, and later divorced. As a mother, she reworked her priorities around her children’s need. She, for example, neither attended language classes nor were able to continue her education because her children were young and a lack of a female-centered network—which was a significant source of help in her home country—affected her after coming to Canada, particularly after divorce. While evidence indicates that language is a determinant of health for immigrants (Bierman et al., 2012), it is critical to note that funding restrictions stemming from the recent cutbacks for providing child care, for expanding the schedule of courses, and for affording free of charge classes after gaining citizenship created significant barriers for accessing language classes for the participant who undertook child care responsibilities and was faced with time poverty and financial demands.

Moreover, as a result of low income, for a while, the participant had been living in social housing. She described the characteristics of her place and neighborhood of residence as a moldy house which had been far away from the nearest grocery store. Consequently, she was forced to buy and carry everything by herself which damaged her health and would result in a permanent disability. While the associations between health and social support networks, physical environment, income and poverty are well recognized, it is necessary to look at the intersections between these determinants with the other social determinants of health and isms—such as sexism and racism just to mention a few—where they often cluster together. As the narrative of the participant highlighted how social processes and forces of racism and sexism intersected to define and structure the place where people of different races and sexes had been living:

All people who lived there were immigrants or people of colour, there was just one white, a white single mom [...] There were better houses, better neighbourhoods, but there was a ranking. You could have accessed to it, if you had been a man and white.

She also articulated that her limited employment opportunities as the results of racist and disablist attitudes had served to determine the conditions under which disability would become a significant force continuing her poverty and deteriorating her health. She indeed suffered a cycle of injustice. She shouldered a heavy burden of ill health and in turn her disability reduced her employment and earning opportunities. In this view disability is “what society, social conditions, prejudices, biases, and built environment have produced” (Hirschman, 2012, p. 398). Put it simply, the inequities are not based on identity, but rather inequities create social identities (Grzanka, 2014).

CONCLUSION

Intersectional approaches by incorporating more dimensions, “provide a powerful alternative way of addressing questions about health disparities that traditional approaches have been unsuccessful in answering” (Weber & Parra-Medina, 2003, p. 222). Health disparities must also be understood, Oxman-Martinez and Hanley observe, “within a context of intersecting domains of inclusion, exclusion and inequality” (as cited in Hankivsky & Christoffersen, 2008, p. 274). I would like to end this paper by emphasizing that the findings of this study are not aimed to generalize the diversity of Iranian immigrant or other immigrant women in Canada, as intersectional framework ask us to think that:

Every person may share concerns and similarities with other people, but every person is unique. Intersectionality is a way of recognizing the similarities that being labeled into a socially constructed category can produce, while also recognizing that generalizations and social categories do not capture the full identity, humanity and unique experiences of every person. (Morris & Bunjun, 2007, p. 10)

Utilizing an intersectional framework can therefore enable us to understand the complex interplay of the SDH and the multiple dimensions of social inequity with focusing on social relationships of power. It provides an opportunity to pay attention to the more complex understandings of health inequities.

REFERENCES

- Bierman, A. S., Johns, A., Hyndman, B., Mitchell, C., Degani, N., Shack, A. R., . . . Parlette V. (2012). Social determinants of health and populations at risk. In A. S. Bierman (Ed.), *Project for an Ontario women's health evidence-based report* (Vol. 2, pp. 1–187). Toronto, ON: St. Michael's Hospital & the Institute for Clinical Evaluative Sciences.
- Bowleg, L. (2012). The problem with the phrase women and minorities: Intersectionality—an important theoretical framework for public health. *American Journal of Public Health, 102*(7), 1267–1273.
- Dhamoon, R. K., & Hankivsky, O. (2011). Why the theory and practice of intersectionality matter to health research and policy. In O. Hankivsky (Ed.), *Health inequities in Canada: Intersectional frameworks and practices* (pp. 16-50). Vancouver, B.C.: University of British Columbia Press.
- Grzanka, P. R. (2014). The (intersectional) self and society. In P. R. Grzanka (Ed.), *Intersectionality: A foundations and frontiers reader* (pp. 67–73). Boulder, CO: Westview Press.
- Hankivsky, O., & Christoffersen, A. (2008). Intersectionality and the determinants of health: A Canadian perspective. *Critical Public Health, 18*(3), 271–283. doi:10.1080/09581590802294296
- Hankivsky, O., & Cormier, R. (2009). *Intersectionality: Moving women's health research and policy forward*. Vancouver, B.C.: Women's Health Research Network.
- Hirschmann, N. J. (2012). Disability as a new frontier for feminist intersectionality research. *Politics & Gender, 8*(03), 396–405. doi:10.1017/S1743923X12000384
- Kvale, S. (2007). Doing Interviews. In U. Flick (Ed.), *The Sage qualitative research kit* (Vol. 2, pp. 1–157). Thousand Oaks, CA: Sage Publications.
- Morris, M., & Bunjun, B. (2007). *Using intersectional feminist frameworks in research: A resource for embracing the complexities of women's lives in the stages of research*. Ottawa, ON: Canadian Research Institute for the Advancement of Women (CRIAOW).
- Public Health Agency of Canada. (2011). *What determines health?* Retrieved from <http://www.phac-aspc.gc.ca/ph-sp/determinants/>
- Raphael, D. (2009). Introduction to the social determinants of health. In D. Raphael (Ed.), *Social determinants of health: Canadian perspectives* (2nd ed., pp. 2–19). Toronto, ON: Canadian Scholars' Press.
- Reid, C. (2007). Women's health and the politics of poverty and exclusion. In M. Morrow, O. Hankivsky, & C. Varcoe (Eds.), *Women's health in Canada: Critical perspectives on theory and policy* (pp. 199–220). Toronto, ON: University of Toronto Press.
- Weber, L. & Parra-Medina, D. (2003). Intersectionality and women's health: Charting a path to eliminating health disparities. In M. T. Segal, V. Demos & J. J. Kronenfeld (Eds.), *Advances in gender research: Gender perspectives on health and medicine: Key themes* (Vol. 7, pp. 181–230). Amsterdam, the Netherlands: Elsevier. doi:10.1016/S1529-2126(03)07006-1
- Wilkinson, L. (2003). Advancing a perspective on the intersections of diversity: Challenges for research and social policy. *Canadian Ethnic Studies, 35*(3), 3–23.
- World Health Organization. (2015). *Social determinants of health*. Retrieved from http://www.who.int/social_determinants/en/

ECONOMIC IMMIGRANT PARENTS IN PRINCE EDWARD ISLAND: THEIR INVOLVEMENT IN EDUCATION

Hsiao Yu Liu

University of Prince Edward Island, Prince Edward Island, Canada

Abstract

Every year Canada increasingly recruits immigrants with a focus on the economic categories; the influx of economic immigrants gradually woven into the Canadian social fabric. Relocating for their children, these immigrants search Canadian education opportunities which illustrates them as active agents for parental involvement. This is a qualitative study that investigate these immigrants' continuum parenting practice in PEI. By applying Epstein (2001) and Coleman (1988) framework, I used semi-structured, opened-end interview approaches to investigate eight economic immigrants' parental involvement and their experiences in Charlottetown public schools. The finding indicates that they were not only holding high expectations to their children, but also actively involved in home-base learning and parent-teacher communications; however, they withdrew from the leadership roles and community collaboration mainly due to language barriers and culture differences. Recommendation were made to include immigrant-parents in Canadian education cultural workshops, foster cross-cultural sensitiveness for family-school communication in educator professional development.

Keyword: economic immigrant, parental involvement, social capital, expectations

INTRODUCTION

For past decades, recruiting and locating economic immigrants have become the most effective measure, both at federal and provincial levels, to address socio-economic issues in rural and smaller provinces in Canada. It is notable that over half of them immigrating in search for education opportunities for their children. There were some initiatives and surveys had conducted in P.E.I to present general public feedback regarding parental involvement in education, immigrant parents' voice was seldom included. This qualitative research aims to investigate economic immigrants' parenting practice in P.E.I public schools. Specifically, I examine (1) what are immigrant parent's obligations and expectations regarding parental involvement in children's education? (2) what practices do immigrant parents adopt when they become involved in their children's schooling and education? (3) what are the underlying experience or issues influencing these practices? (4) being immigrant-parents, what do they perceive as their roles and functions in their relationships with schools? The purpose of this study is to understand the degree to which the immigrant parents become and continue to involve themselves in their children's schooling and education experience.

CONTEXT

The parental involvement refers to parent participation at school or/and home-base activities to support children education (Hoover-Dempsey, Dallaire, Green, Sandler, & Walker, 2005; Peña, 2000). Parental involvement practiced at various forms and to different degrees, it also subjected to factors like race, ethnicity, socio-economic status, education attainment, communication and cultures (Garcia & Marks, 2009; Ji & Koblinsky, 2009; Harry, 1992). Additionally, time availability, family structure and multi-generation residential arrangements proved to be influential in parents' education involvement (Muller, 1995; Bengtson, 2001; Crosnoe, 2001). Studies show much positive learning outcomes attributing to parental involvement in children's schooling (Hoover-Dempsey, Dallaire, Green, Sandler, & Walker, 2005), including the positive learning outcomes related to immigrant parents' expectations to children's achievements. However, studies show that the phenomenon may overlook the challenges existing among immigrant-students (Anisef, Brown, Phythian, Sweet, & Walters, 2008; Glick & Hohmann-Marriott, 2007; Kao & Tienda, 2005); examples like the ¹astronaut families and satellite kids, are common in immigrant communities. To improve overall learning outcome and student wellbeing, Chavkin (1993) proposed that the best approach is to increase parental involvement in education. For past decades, P.E. I continue to recruit newcomers to meet its needs in growing population and stimulating local business. As a community consists most English-speaking, Anglophone decedents, P.E.I. possesses many attractive characteristics as well as unique challenges for newcomers. The challenges such as lack of access to employment and investment opportunities regardless the immigrants' skills, expertise and financial capital; as well as the exclusion from existing social networks (Randall J.E., Kitchen P., Muhajarine N., Newbold B., Williams A. & Wilson K., 2014). This study aims to examine the latest landed economic immigrants and their parental involvement as a form of social participation in Island community.

¹ The term 'astronaut families' refers to those male adult family members immigrated to Canada to advance their financial circumstances, but left their children at the home country and sending regular remittances. The satellite kids, on the other hand, indicate a situation where the adult members of the family (parents) return to the country of origin following after the migration.

STUDY

By using Epstein (2001) and Coleman (1988) framework, this study employed the qualitative research approaches to document and analyze economic immigrants' parental involvement in children's education. Eight immigrant-parents were interviewed in 2014. Later the data were recorded, transcribed and analyzed through computer software.

FINDINGS

Immigrant parental involvement in P.E.I.

1. Parents immigrated to Canada for children's education and opportunities; they regarded the task as their parental obligation for their children, therefore, they have high expectations on children's learning outcomes.
2. Parents were much involved in home-based learning and homework subversion, as well as in parent-teacher communication; there was significant absence if immigrants' participation in the roles, like parent advisory council or any other collaboration with the community, such as volunteering.
3. Schools, schoolteachers and parent-teacher meetings are the primary sources for immigrants to collect education information; drastic divides existing in their differentiated access to technology, social media and information channels.

Issues and Challenges in Immigrant Parents' Involvement

1. Immigrant families experienced culture shocks, language barriers and social exclusion while adjusting to Island community. Although they were benefited from immigrant service providers and community organization's support; quite often, immigrant parents were the ones to deal with the issues.
2. Language barriers were not only existing in communication or at skill level, but also in cultural language. Different school dynamics and systems challenged immigrant parents in continuing their education involvement.
3. The initiative of inquiry charged individual student, rather than parents or families, to seek education information and opportunities. In some cases, children took over the parent's role and become messengers between home and schools.
4. Island immigrant out-migration has cast impact on their representation in school community and long-term committeemen for immigrants' education involvement.

CONCLUSION

The parents were satisfied by achieving their goal for immigration, in terms of their children's positive, safe and stress-free learning outcomes in Island schools. There was significant absence of immigrants' participation in connection with Island community at many levels, very few immigrants entered into roles of leadership and advocacy; there are increasingly substantial divides, barriers and challenges for immigrant parents in obtaining needed information to improve their parental involvement in Canadian education. In fact, the parents recognized the needs to support the Canadian education values and cultures for children to successfully integrate into Island community; along the same lines, they also maintained the connection to their cultural roots through family rituals and informal learning at home. The

dilemmas of personal, family and social transformation challenge immigrant-parents' capacity to find "both/and" solutions, instead of "either/or" choice about incorporation of cultural change (Falicov, 2002). The dual perspectives not only displayed in their strategy on sustaining multiple culture, faith and language supporting systems for children, but also asserting in their high expectations for children's learning outcomes. Despite their experiences with culture shocks and social exclusion, immigrant-parents wanted to continually involve themselves in children education. In this study, the data indicates that their parental involvement become valuable for sustaining cultural identities in Canadian diversity community, and nurturing children's positively social participation and distinctive achievements in Island public schools.

RECOMMENDATIONS

These results also identify and point out some recommendations. First, all the stakeholders involved (provincial government, schoolboards, universities, community organizations, etc.) could team-up and develop a greater awareness for the needs to close divides, fill gaps and promote collaboration between immigrant-families and schools, not only in policies and initiatives, but also through training programs and services. For example, professional development workshops on the family-school relationships with a specific focus on cross-cultural communication would help future teachers to best facilitate the parent-teacher conversation. Secondly, to broadcast and promote the parent-teacher meetings through social media and Internet, and equip with support from community organizations on volunteering basis will accumulate more resources to foster connection between newcomers and local families. At the same time, school personnel and educators can make a more conscious effort to understand parents' perceptions of parental involvement in multi-cultural perspectives, as well as to explicitly inform parents about schools' expectations on their parental involvement in education. Finally, in-service teachers should receive up-to-date knowledge to inform their perception on increasingly diverse immigrant students and their families.

REFERENCES

- Anisef, P., Brown, R. S., Phythian K., Sweet, R., & Walters, D. (2008). *Early school leaving among immigrants in Toronto secondary schools* (CERIS Working Paper No. 67). Retrieved from http://www.ceris.metropolis.net/wp-content/uploads/pdf/research_publication/working_papers/wp67.pdf
- Bengtson, V. L. (2001). Beyond the nuclear family: The increasing importance of multigenerational bonds. *Journal of Marriage and Family*, 63(1), 1–16.
- Chavkin, N. F. (1993). *Families and Schools in a Pluralistic Society*. Albany, NY: SUNY Press.
- Epstein, J. L. (2001). *School, family, and community partnerships: preparing educators and improving schools*. Boulder, CO: Westview Press.
- Falicov C. J. (2003). *Normal family process: growing diversity and complexity* (3rd ed.). New York: Guilford Press.
- García C. T., & Marks, A. (Eds.) (2009). *Immigrant stories: Ethnicity and academics in middle childhood*. New York, NY: Oxford University Press.
- Glick, J. E., & Hohmann-Marriott, B. (2007). Academic performance of young children in immigrant families: The significance of race, ethnicity, and national origins. *International Migration Review*, 41(2), 371–402.
- Coleman, J. S. (1988). Social Capital in the Creation of Human Capital. *American Journal of Sociology*, 94, S95–S121.
- Crosnoe, R. (2001). Academic orientation and parental involvement in education during high school. *Sociology of Education*, 74, 210–230.
- Harry, B. (1992). Cultural diversity, families, and the special education system: *Communication and empowerment*. New York: Teachers College Press.
- Hoover-Dempsey, K. V., Walker, J.M.T., Sandler, H.M., Whetsel, d., Green, C.L., Wilkins, A. S., & Closson, K. (2005). Why do parents become involved? Research findings and implications. *The Elementary School Journal*, 106(2), 105–130. doi:10.1086/499194.
- Ji, C., & Koblinsky, S. A. (2009). Parent involvement in children's education: an exploratory study of urban, *Chinese Immigrant Families*. *Urban Education*, 44(6), 687–709.
- Kao, G., & Tienda, M. (2005). Optimism and achievement: The educational performance of immigrant youth. In M. M. Suarez-Orozco, C. Suarez-Orozco, and D. B. Qin (Eds.), *The new immigration: An interdisciplinary reader* (pp. 331–343). New York: Routledge.
- Muller, C., & Kerbow, D. (1993). Parent involvement in the home, school, and community. In B. Schneider & J. S. Coleman (Eds.), *Parents, their children, and schools* (pp. 13–42). Boulder, CO: Westview Press.
- Peña, D. C. (2000). Parent involvement: Influencing factors and implications. *Journal of Educational Research*, 94(1), 42–54.
- Randall, J. E., Kitchen, P., Muhajarine, N., Newbold, B., Williams, A., & Wilson, K. (2014). Immigrants, islandness and perceptions of quality-of-life on Prince Edward Island, Canada. *Island Studies Journal*, 9(2), 343–362.

A GENERATIVE STUDY ON CAUSATIVE DERIVATION IN MANDARIN CHINESE

Yanxiao Ma

Memorial University of Newfoundland, Newfoundland and Labrador, Canada

Abstract

The aim of this study is to analyze causative derivation with a case study on causative Verb Copying Construction (VCC) and causative Object Fronting Construction (OFC) in Mandarin Chinese. Following Alexiadou et al. (2006), I will argue a non-derivational approach between these two constructions, but a common base [$DP_{\text{ext.arg}}$ VOICE[CAUS[$\sqrt{\text{Root}}$]]] has been detected. It's found the constructions have different derivational approaches: base-generation in VCC and movement operation in OFC. It's also observed that the resultative compound in the two constructions are different items in Lexicon, and have different argument structures. It's hoped the study might provide a new understanding on the constructional similarities and differences between VCC and OFC in Mandarin Chinese.

Keywords: VCC; OFC; causative; non-derivational

INTRODUCTION

Verb Copying Construction (VCC) and Object Fronting Construction (OFC) are two different sentential constructions in Mandarin Chinese. VCC is represented as: NP1+V1+NP2+V2+XP. NP1 is the subject. NP2 and XP stand for object and complement respectively. V1 and V2 are verbs with the same verbal form. OFC in this study is formed by omitting V1 based on VCC, formalized as NP1+NP2+V+XP. This study will focus on the derivations of causative VCC and OFC without DE as seen in (1) and (2), in which the complement contains a resultative verb, i.e., fan ‘get bored’.

(1) Ta chi rou chi fan le. (Jiang 2006)

He eat meat eat bored PERF

‘He ate meat and became bored as a result.’

(2) Ta rou chi fan le. (Ditto)

He meat eat bored PERF

‘He ate meat and became bored as a result.’

Different from Jiang (2006) and Ma (2014), I argue these two constructions don’t have the derivational relation by following the framework of Alexiadou et al. (2006). Instead, they derive from a common base.

CAUSATIVE PREDICATE PROJECTION

According to Kratzer (1996), three predicates CAUSE, BECOME and STATE exist in causatives, while the Voice projection seems to have only syntactic function of introducing external arguments and no concrete eventive semantics. To integrate it into the event composition of causative verbs may result in a blending of syntactic units and event predicates. In addition, some studies claim CAUSE can take part in the syntactic operations by introducing internal arguments, but this function has been questioned by many other scholars (Lin 2004; Ramchand 2008). Finally, Kratzer (2005) argues that if CAUSE does not introduce the external argument itself, then the BECOME predicate could be got rid completely (Cited in Schafer 2008). Under this view, the abstract decomposition of causatives can be represented in (3). Following Kratzer (2005) and Alexiadou et al. (2006), I will analyze causative VCC and OFC, but arguing the two constructions share a common base as seen in (4). The derivations will be illustrated in the following section.

(3) [DP_{ext.arg} VOICE [CAUS[√Root+DP_{Theme}]]] (Cited in Schafer 2008)

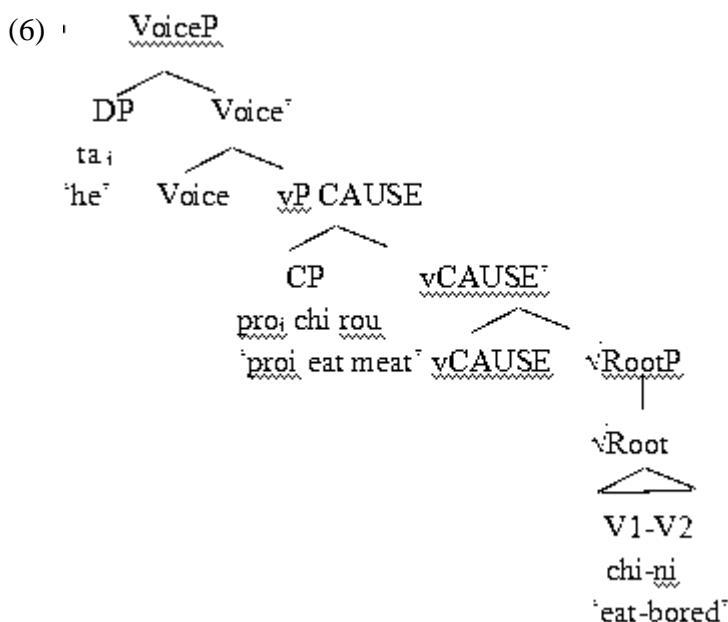
(4) [DP_{ext.arg} VOICE [CAUS[√Root]]]

CAUSATIVE DERIVATIONS

Analysis on Causative VCC

First, the causative VCC in (1) is repeated as (5) below, and the study assumes V2 (the second verb) *chi* ‘eat’ and the verb in complement *fan* ‘get bored’ forms a resultative verbal compound. The compounding verb is formed in the Lexicon, and the same argument could be found in Li (1990). That is, *chi-ni* ‘eat-get bored’ is not derived through syntax, but formed in the lexicon as a whole. With this assumption, the $\sqrt{\text{Root}}$ in the causative VCC is V1V2 *chi-ni* ‘eat and get bored’, which is followed by the CAUSE projection and Voice Projection. The external argument is introduced just by the head Voice. The whole process is represented in (6)¹.

- (5) Ta chi rou chi fan le. (Jiang 2006)
 He eat meat eat bored PERF
 ‘He ate meat and became bored as a result.’

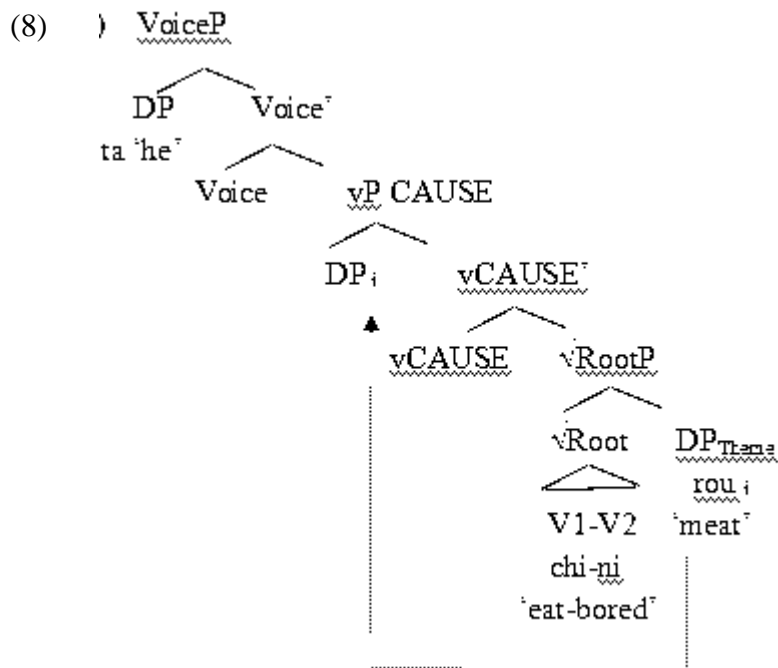


This study holds that the causative constitute is a CP with an empty pronoun abbreviated as the little *pro*, which has the same index with the subject DP *ta* ‘he’. The causative constituent is base-generated in the specifier of vP CAUSE. The V2 and the verb in complement form the RVC *chi-ni* ‘eat-bored’, formed in the lexicon before the syntactic merger operation.

Analysis on Causative OFC

For the causative OFC, I will repeat (2) in section 1 as (7) below for convenience, and argues it has the derivational process as observed in (8).

- (7) Ta rou chi fan le. (Jiang 2006)
 He meat eat bored PERF
 ‘He ate meat and became bored as a result.’



This study argues that causative OFC doesn't have the derivational relation with causative VCC. Based on (8), I claim that the causative constituent in OFC is DP, which undergoes the movement operation from the complement of $\sqrt{\text{Root}}$. The movement of DP *rou* 'meat' is attributed to the informational projection TopicP or FocusP, which is external to VoiceP. The argument considering NP2 *rou* 'meat' in OFC as sentence-internal TopicP or FocusP can be detected in Hsu (2008) and Ma (2014), etc. Besides, in this study I assume that the resultative compound in causative VCC and OFC are different items in Lexicon. The compound in VCC is a one-place predicate without the internal argument; but the compound in OFC is a two-place predicate, merging with the internal argument (i.e. DP_{Theme}).

CONCLUSION

This study mainly analyzes the causative derivation by comparing causative VCC and OFC in Mandarin Chinese. It is found that these two constructions don't have any derivational relation, i.e., neither is derived directly from the other. Instead, the two constructions share a common base [DP_{ext.arg} VOICE [CAUS[$\sqrt{\text{Root}}$]]]. Besides the similarities, two major differences between their derivations are observed: (1) causative VCC derives through base-generation, but causative OFC involves the movement operation; (2) the resultative compound in VCC and OFC show different argument structures (one-place predicate / two-place predicate), and they are considered as different items in Lexicon. It is hoped that this study can provide a new understanding on the causative derivation as well as the constructional comparison between VCC and OFC in Mandarin Chinese.

REFERENCES

- Alexiadou, A., Anagnostopoulou, E., & Schäfer, F. (2006). The properties of anticausative crosslinguistically. In M. Frascarelli (Ed.), *Phases of Interpretation* (pp. 187–211). Berlin: Mouton.
- Hsu, Y. (2008). *The Sentence-Internal Topic and Focus in Chinese*. Proceedings of the 20th American Conference on Chinese Linguistics (NACCL-20). Retrieved from <https://naccl.osu.edu/naccl-20/proceedings>
- Jiang, L. (2006). *On the syntactic relation of verb-copying construction and topic structure in Mandarin* (Unpublished master's thesis). Peking University, Beijing, China.
- Kratzer, A. (1996). Severing the external argument from the verb. In J. Rooryck and L. Zaring (Eds.), *Phrase structure and the lexicon* (pp. 109–137). Dordrecht: Kluwer.
- Kratzer, A. (2005). Building resultatives. In C. Maienborn and Wollstein-Leisten (Eds.), *Events in syntax, semantics, and discourse* (pp. 177–212). Tübingen: Niemayer.
- Li, Y. (1990). On V-V compounds in Chinese. *Natural Language and Linguistic Theory*, 8, 177–207.
- Lin, J. (2004). *Event structure and the encoding of arguments: The syntax of the Mandarin and English verb phrase*. Cambridge: The MIT Press.
- Ma, Y. (2014). *Constructional transformation from VCS to OFS in Mandarin Chinese* (Unpublished master's thesis). Beijing Language Culture University, Beijing, China.
- Ramchand, C. (2008). *Verb meaning and the lexicon: A first-phase syntax*. Cambridge: Cambridge University Press.
- Schafer, F. (2008). *The syntax of (anti-)causative-external arguments in change-of-state contexts*. Amsterdam: John Benjamins Publishing Company.

PARENTS' PERSPECTIVES: NON-FRANCOPHONE PARENTS OF CHILDREN IN FRANCOPHONE SCHOOLS

Mary M. MacPhee

University of Prince Edward Island, Prince Edward Island, Canada

Abstract

This research is the first known mixed methods study in Canada to investigate the experience of non-francophone (NF) parents in Atlantic Canada focusing beyond exogamous couples. These findings drawn from recent dissertation data collection explore the educational beliefs, experiences, and involvement of NF parents who have chosen a francophone school for their children. The parents reported overall satisfaction with a French school but faced challenges with communications from the school, difficulty helping with homework, extra time and energy required to help in a second language, and limited resources for children with special needs. Parents recommended making all parents feel welcomed and involved in diverse ways, offering communications in English as well as French or options for translating to English, and empowering parents with language strategies.

Keywords: parent involvement; non-francophone parents; French minority language education; exogamous couples

INTRODUCTION

French minority language schools are vital components to the maintenance and survival of the French language and culture in minority language contexts across Canada and elsewhere (Arsenault-Cameron, 2000; Fishman, 1991; Landry & Rousselle, 2003; Landry, 2010; Martel, 2001; Skutnabb-Kangas, 2000). Parents, as well as educators, play a key role in the success of students and their schools. The *Canadian Charter of Rights* determines which parents are right-holder parents eligible to choose minority language schools for their children (Power, 2011). Yet, despite Charter definitions for eligibility, language boundaries are not clear. Some right-holder parents do not speak French, and an increasing number of the students populating French schools come from families where little or no French is spoken or parents are non-francophone (NF) but married to a francophone (Ontario Ministry of Education, 2009). In this research I explored NF parents' beliefs, experiences, and involvement in their children's education at a French school. The purpose of this paper and poster presentation is to provide an opportunity for discussion of introductory findings from the recently completed data collection for my dissertation. The findings relate to common barriers NF parents faced when trying to be involved as well as the parents' suggestions about how to help other NF parents.

CONTEXT

Extensive research from a variety of educational contexts has shown that parental involvement in children's education is a strong indicator of academic and social achievement (Desforges & Abouchaar, 2003; Epstein, 2001; Jeynes, 2007, 2010; Weiss, Buffard, Bridgall & Gordon, 2009). Literature from the minority language context confirms the importance of parental involvement for student achievement and that the role of family is especially critical for valuing and supporting use of the minority language and identity construction for children (Archer, Francis & Mau, 2010; Council of Ministers of Education, Canada, 2003 [CMEC]; Fishman, 1990, 1991; Landry, 2010). However, in varying Canadian contexts between 7.5 and 33.5% of children in French schools are from anglo-dominant or other NF families where little or no French is spoken at home (CMEC, 2002; Allen & Cartwright, 2004; Cormier & Miller, 2013). A recent study in a rural community in Atlantic Canada showed that up to 75% of parents of children attending the French minority language schools in the community were NF with minimal self-reported French proficiency (MacPhee, Turnbull, Gauthier, Cormier & Miller, 2013). Also, 66% of right-holder students come from exogamous couples² with one NF parent (Landry, 2010), which indicates a large number of NF parents involved in French minority language schools. With an ever increasing representation of NF parents in francophone schools, what are the beliefs, experiences, and involvement of these parents relative to the education of their children in French?

THE STUDY

This research was based on a mixed methods research design with 13 focus group interviews involving 43 people and an online survey with just over 100 participants. The parent

²Exogamous couples are comprised of two adults who speak different maternal languages. In this context the typical couple has one francophone and one anglophone parent.

difficulties and suggestions highlighted here are based on the focus group interviews with NF parents. The average interview lasted 80 minutes. The parent participants represented exogamous couples (a NF parent married to a francophone), immigrant parents, NF parents with French heritage, and NF parents without French heritage. The participants were principally Anglo-dominant, but 13 parents also had French proficiency from being French immersion students themselves or from using French in the work place.

FINDINGS

Parents were asked about the challenges they experienced as a NF parent to a child being educated in a French school. The comments I have chosen to highlight here are based on their frequency from the majority of the focus groups, however the list is *in no particular order*. Parents reported educational involvement challenges and not surprisingly, the French language was among these challenges. Parents across focus groups repeated that at home they struggle to understand French written communication to home from school and to understand homework content and assignments. Several parents emphasized having spent time figuring out a memo or written message to discover it was not even relevant to them or their children. Participants agreed that being involved with French education takes much more time, energy, and effort than if it were in the parent's mother tongue. In addition, many shared feeling that they cannot be involved at home or in school to the degree they would like without devaluing French by their own use of English or their mother tongue, and they feel unsure how to help with school or language development. In the higher grades, when questioned about the children's future in a French school, NF parents stated they desperately need information about high school choices in English and French schools. Concerning community involvement, some NF parents commented that they did not participate and others reported not feeling a sense of belonging to the French school or that without the French language it was difficult to participate. Another concern for parents was the travelling distance to the school for children. The distance required a long bus ride rather than a short walk to the neighborhood school and also meant that school friends are not located nearby in their own neighborhood. Several parents of children with special needs requested improved resources for children with special needs.

Parents also made suggestions about how school and teaching staff can help NF parents to be involved or to reduce barriers to involvement. Again these comments have been chosen because of the frequency with which they appeared during the focus group interviews, yet are presented *in no particular order*. Parents made recommendations to help them understand communications from the school which include providing a way to translate to an English version of memos on the school website, having communication from school such as memos sent home in a bilingual format, and suggesting a language or school buddy-mentor-partner to help NF parents. School staff sharing tips and programs at the beginning of the year to translate notes from French to English would be beneficial. Several NF parents recommended reorganizing school newsletters for parents to easily find information on youngest students earlier in the newsletter and older students later in the text, and general information relevant to all students prior to grade specific information. Parents explained that older children can read and help decipher messages in the later grades but NF parents with children in the first three years mentioned needing more support. Other parent proposals included offering an English version of notes for NF parents to refer to at French meet-the-teacher night or open house sessions.

To further facilitate NF parent involvement, participants wondered if school professionals could offer sessions to parents in English which focus on how parents can help students with reading, language development, literacy, and numeracy development, and programs to help with pronunciation and reading in French at home (when parents are afraid to make mistakes that might mislead children). The overall desire of participants was for school staff to welcome diverse parents explicitly and encourage a sense of belonging, as well as to provide an opportunity for parents to volunteer in diverse ways even when their mother tongue is not French.

CONCLUSION

The dialogues with parents revealed that parents have a strong desire to be involved in the education of their children, and they highly value bilingualism as citizens of Canada. Parents who had children in French schools for many years had increasingly positive experiences over time after the initial difficulty of translating school memos and navigating other communication issues. Parents noted that once their children had developed reading skills around grade three, they could help with interpreting French notes at home as the years progressed. NF parents who had received strong support from early-years educators in French childcare in school centers reported the most positive experiences. Finally, parents agreed that French education is a much greater challenge for them as parents than an education in the home language. However, these parents explained that the difficulties they faced were well worth it for the future opportunities and advantages that learning French would allow their children.

To conclude, these introductory research findings present NF parent challenges and suggestions to help parents surmount these difficulties. This report is offered as an early release of findings prior to completion of the dissertation because they will be helpful immediately, not only in the French minority school context in Canada, but in any context where parents do not speak the dominant language of the school at home. As communities become more multicultural in Canada and around the world, the principles of welcoming, informing, and accompanying parents in diverse ways and encouraging involvement in diverse ways, grows ever more important. This research helps school professionals to understand the needs of parents and some of the barriers they face. When school leaders and teachers reach out to parents by responding to the recommendations proposed here, it will empower parents to understand how to assist their children succeed in school regardless of the languages spoken.

REFERENCES

- Archer, L., Francis, B., & Mau, A. (2010). The culture project: Diasporic negotiations ethnicity, identity, and culture among teachers, pupils, and parents in Chinese language schools. *Oxford Review of Education*, 36(4), 407–426.
- Arsenault-Cameron C. Île-du-Prince-Edouard [2000] 1 R.C.S. 3 (CSC).
- CMEC. (2003). *La francisation : Parcours de formation. Projet pancanadien de français langue première à l'intention du personnel enseignant de la maternelle à la 2e année*. Toronto, ON: Auteur. <http://204.225.6.243/else/francisation/cd-rom/>
- Desforges, C., & Abouchar, A. (2003). The impact of parental involvement, parental support and family education on pupil achievement and adjustment: *Research Report 433*. London, England: Department for Education and Skills.
- Epstein, J. L. (2011). *School, family, and community partnerships: Preparing educators and improving schools* (2nd ed.). Boulder, CO: Westview Press.
- Fishman, J. A. (1990). What is reversing language shift (RLS) and how can it succeed? *Journal of Multicultural Development*, 11(1–2), 5–36.
- Fishman, J. A. (1991). *Reversing Language Shift*, Clevedon, England: Multilingual Matters.
- Jeynes, W. (2007). The relationship between parental involvement and urban secondary school student academic achievement: A meta-analysis. *Urban Education*, 42(1), 82–110.
- Jeynes, W. (2010). The salience of the subtle aspects of parental involvement and encouraging that involvement: Implications for school-based programs. *Teachers College Record*, 112(4), 747–774.
- Landry, R. & Rousselle, S. (2003). *Éducation et droits collectifs. Au-delà de l'article 23 de la Charte*. Moncton, NB: Éditions de la francophonie.
- Landry, R. (2010). *Petite enfance et autonomie culturelle. Là où le nombre le justifie...V*. Moncton, NB: Institut Canadien de Recherche sur les Minorités Linguistiques.
- MacPhee, M., Turnbull, M., Gauthier, R., Cormier, M., & Miller, T. (2013). *Stakeholder consultation relating to non-francophone students enrolled in minority French language schools in PEI - parents, teachers and school leaders*. Final report. Charlottetown, PE: University of Prince Edward Island.
- Martel, A. (2001). *Droits, écoles et communautés en milieu minoritaire, 1986-2002 : Analyse pour un aménagement du français par l'éducation*. Ottawa, ON: Bureau du Commissaire aux langues officielles.
- Power, M. (2011). L'article 23 de la Charte canadienne des droits et libertés: Fondements, effets réparateurs et applications. Dans J. Rocque (Dir). *La direction d'école et le leadership pédagogique en milieu francophone minoritaire- considerations théoriques pour une pratique éclairée*, (pp. 45–60). Winnipeg, MB : Presses Universitaire de Saint-Boniface.
- Skutnabb-Kangas, T. (2000). *Linguistic genocide in education – or worldwide diversity and human rights?* London, England: Lawrence Erlbaum Associates.
- Weiss, H. B., Buffard, S. M., Bridgall, B. L., & Gordon, W. E. (2009). Reframing family involvement in education: Supporting families to support educational equity. *Equity matters: Research review No. 5*. New York, NY: Teachers College, Columbia University.

CHINESE EAP STUDENTS' PERCEPTIONS OF CHALLENGES DURING THE TRANSITION PERIOD

Sherry Neville-MacLean

St. Francis Xavier University, Nova Scotia, Canada

Abstract

This research represents my collection of students' voice about challenges faced in language learning and acculturation in an attempt to improve my practice. The participants were seven Chinese transfer students who had participated in an English for Academic Purposes (EAP) program set in a rural Canadian community over three subsequent years. Using an ethnographic approach, interview transcripts and documents were analyzed. One action resulting from the analysis of interviews and documents was my advocacy for an initiative to improve social integration. It is recommended that university administrators foster an environment of cultural proficiency and consider extended EAP support and that future research regarding potential marginalization of international students be conducted.

Keywords: English language learners (ELLs), English for Academic Purposes (EAP), international students, transition phase

INTRODUCTION

As an English for Academic Purposes (EAP) instructor, I became concerned the curriculum revision process was primarily impacted by instructors' collective beliefs about students. Supported by Eslami's (2010) claim that "instructors may not always be the best judges of students' needs and challenges" (p. 7) and Currens' (2011) promotion for the inclusion of students' voice as a means of "co-creating" the learning experience, I sought students' voice prior to making further changes to improve teaching practices.

Much literature on international students' experiences is based in other countries; however, research on their experiences in Canadian universities has been growing over the past decade. Recently, Leary (2011) researched Atlantic Canadian post-secondary institutions' support of first-year international students. The researcher concluded international students share some transition challenges with domestic students, such as meeting other students, adjusting to their new environment, gaining knowledge of policies and regulations, and dealing with homesickness. The unshared challenges international students experience involved undergoing acculturation, accessing ethnic foods, completing immigration papers, and adjusting to the English language. The researcher proposed universities may unintentionally disengage international students early in the journey by separating orientation programs.

Fox, Cheng, Berman, Song and Myles (2006) interviewed English language learners (ELLs), EAP instructors, and discipline-specific professors/instructors at three universities to further knowledge about the acculturation of the ELLs. Despite variety in motivators, ELLs reported their motivators played a role in their academic acculturation. Participants reported using strategies both academically and socially as they adjusted to their new settings. During their acculturation, ELLs found support in people such as their roommates or housemates, classmates, and professors or instructors, and in services on and off the campuses.

Acknowledging Fox et al.'s (2006) rationalization that "the heterogeneity and 'positioning' of the population under investigation must be kept in mind when making generalizations and predictions regarding...student needs, and recommendations for language support programs" (p. 2); influenced by Vygotsky's ideas (1978) of constructivism; and recognizing my teaching methods were congruent with Community Language Learning and Communicative Language Teaching (Larsen-Freeman, 2000), I set out for answers to the following research questions:

1. What are Chinese students' assets and challenges surrounding language learning and acculturation?
2. Which aspects of EAP do students find more and less helpful?
3. What are the non-formal and informal learning experiences of Chinese students in a rural Canadian university setting?
4. What supports do the students want and need?

The focus of this report is on the findings regarding students' challenges.

METHOD

My research interests were situated in the interpretive field (Merriam, 2009; Cooper & White, 2012). Accordingly, ethnographic methodology was selected, and interviews and documents were chosen as the methods (Merriam, 2009). Semi-structured interviews were conducted, audio-recorded, and later transcribed. Photographs, oral journal entries, and anonymous student feedback were examined. With the combination of data collected, a rich source of data – in keeping with Geertz’s (1994; 1994, as cited in Cooper & White, 2012) concept of thick description – was anticipated to accrue.

To maximize generalizability to the population with which I work, four selection criteria were chosen. Participants had to be Chinese, be ELLs, have completed at least two years of university in China, and have experienced their first time living abroad when entering the EAP program. Chinese students who completed a pre-sessional EAP program in 2013, 2012, and 2011 were invited to participate in the research via an e-mail message. Participants’ demographics are summarized in Table 1. To maintain confidentiality, pseudonyms are used for the participants and the universities.

Table 1

Participant Demographics

Participant Name	Sex	Home University	Year of Study in Canada	Program
Guozhi	M	A	second	Bachelor of Information Systems
Ling	F	B	third	Bachelor of Information Systems
Tengfei	M	A	first	Bachelor of Science
Chung	M	A	first	Bachelor of Science
Huiqing	F	C	first	Bachelor of Business Administration
Renshu	M	A	first	Bachelor of Information Systems
Huan	M	B	second	Bachelor of Science

RESULTS

Participants’ responses about challenges faced varied, but four themes emerged as being both assets and challenges: previous English training, living with co-nationals, experiences with domestic students and professors, and timing of the EAP course. While all participants had previous language training, only one participant felt prepared. The most cited reason for feelings of under-preparedness or unpreparedness was a lack of interlocution with English speakers. Living with co-nationals was discussed positively in terms of providing social support and negatively for limiting English language practice and exacerbating isolation problems.

Participants noted unfavourable interactions with domestic students in the dormitories and on the campus and with professors, including being ignored by roommates, difficulties finding commonalities on which to base friendships or penetrating existing cliques, and dismissal when language barriers presented. Some participants explained, once developed, friendships permitted “fun” learning of the language and culture, and a learning atmosphere was created when questions were welcomed. While the pre-sessional nature of the EAP program was reportedly beneficial in preparing participants for their subsequent classes, particularly with listening, its disadvantage was limited opportunities to engage with domestic students, as many domestic students went home for the summer months.

Participants identified challenges associated with arrival as a cohort, such as the decreased chance of practicing their English skills among each other, even in EAP classes, and the difficulty with breaking out of the group to interact with other people on campus. Academic demands on their time, fatigue, and limited meal selection seemed problematic, particularly during the EAP program. Learning cultural norms was reported as a minor challenge. Longer-lasting or weightier challenges consisted of time concerns and unmet expectations. Some participants explained they felt learning the language and the culture required more time than the pre-sessional EAP program allowed or they required more time than domestic peers to complete academic tasks. Participants felt disappointment when requests for living arrangements were not filled and frustration after receiving fewer transfer credits and less registration assistance than expected or news about unmet time-to-graduation expectations. The frustrations resonated in the documents.

DISCUSSION

Limitations

Limitations of the study include the recruiting process and language barriers. Students’ inundation by email messages frequently results in their disregard of mass messages. Posters in areas frequented by EAP students and/or announcements delivered by student societies may have also been utilized. The participants’ proficiency levels in English and my inability to speak their native language, Mandarin, limited my ability to collect all their ideas.

Improving Practice

Based mainly on recommendations made by Guozhi and Ling, I advocated for a revised hiring strategy for student employees intended to aid in transition, to include native-English speakers (including Canadians) rather than only former EAP students. I proposed these employees be tasked with a cultural ambassador role – helping engage the EAP students in various socializing activities, familiarizing them with popular culture and social media, and teaching them about social norms. The objective of my suggestions was to increase chances for communicative interaction with peers.

Recommendations

Cultural proficiency training should be offered to professors and service providers as professional development – a recommendation echoing both Briguglio and Smith’s (2012) and Leary’s (2011) suggestions. Such professional development sessions allow university personnel to interact effectively with international students and promote a safe environment for all. I argue that training ought to be extended to domestic students as well, to prepare them to be global citizens.

Estimates about the time required for ELLs to gain conversational English language proficiency and to gain cognitive academic language proficiency are between 5-11 years (Douglas, 2010). If the goal of the EAP program is to improve language proficiency, a program duration of four to eight weeks seems too short. If the goal of the EAP program is to help students undergo acculturation, a similar problem exists. Studies have reported international students may not integrate even after years of being abroad (for example, Fox et al., 2006).

Future Research

One recommended study would be to investigate both international and domestic students’ perceptions of international students on campus. Of particular interest are students’ perceptions of if and how international students are homogenized, “foreigni[z]ed,” and “otheri[z]ed,” (Tian & Lowe, 2009, p. 673). An ideal study would be powerful enough to reveal any similarities or distinctions for Chinese students and other international students.

REFERENCES

- Briguglio, C., & Smith, R. (2012). Perceptions of Chinese students in an Australian university: Are we meeting their needs? *Asia Pacific Journal of Education*, 32(1), 17–33. doi:10.1080/02188791.2012.655237
- Cooper, K., & White, R. (2012). *Qualitative research in the post-modern era: Contexts of qualitative research*. New York, NY: Springer.
- Currens, J.B. (2011). How might the student voice affect transformation in higher education? In W. Kidd & G. Czerniawski (Eds.), *The student voice handbook: Bridging the academic/practitioner divide* (pp. 185–196). Retrieved from <http://reader.ebilib.com.libproxy.stfx.ca>
- Douglas, S. R. (2010). *Non-native English speaking students at university: Lexical richness and academic success* (Unpublished doctoral dissertation). University of Calgary: Calgary, Alberta. Retrieved from <http://dspace.ucalgary.ca/handle/1880/48195>
- Eslami, Z. R. (2010). Teachers' voice vs. students' voice: A needs analysis approach to English for Academic Purposes (EAP) in Iran. *English Language Teaching*, 3(1), 3–11.
- Fox, J., Cheng, L., Berman, R, Song, X., & Myles, J. (2006). *Costs and benefits: English for academic purposes instruction in Canadian universities*. Retrieved from <http://www.carleton.ca/slals/wp-content/uploads/cpals-2006-Fox-et-al.pdf>
- Geertz, C. (1994). Thick description: Toward an interpretive theory of culture. In M. Martin & L.C. McIntyre (Eds.), *Readings in the philosophy of social science* (pp. 213–232). Cambridge, MA: Massachusetts Institute of Technology.
- Larsen-Freeman, D. (2000). *Techniques and principles in language teaching* (2nd ed.). China: Oxford University Press.
- Leary, T. (2011). *Supporting international students with first year transition into Canadian universities: Recommendations from Atlantic Canada* (Unpublished dissertation). University of Calgary, Alberta, Canada.
- Merriam, S.B. (2009). *Qualitative research: A guide to design and implementation*. San Francisco, CA: Jossey-Bass.
- Tian, M., & Lowe, J. (2009). Existentialist internationalisation and the Chinese student experience in English universities. *Compare: A Journal of Comparative and International Education*, 29(5), 659–676. doi:10.1080/03057920903125693
- Vygotsky, L. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.

FROM RISK ANALYSIS TO RISK GOVERNANCE: THE CASE STUDY OF THE EBOLA VIRUS DISEASE

Temitope Tunbi Onifade

Memorial University of Newfoundland, Newfoundland and Labrador, Canada
University of Calgary, Alberta, Canada

Abstract

Epidemic outbreaks threaten jurisdictions beyond domestic boundaries and affect diverse societal interests. How to properly handle them therefore becomes an issue of interest for all stakeholders and individuals. The two current approaches to handling them are called risk analysis and risk governance. Risk analysis is the classical model while risk governance is only emerging. What might risk governance contribute to risk analysis? The recent Ebola Virus Disease (EVD) outbreak presents an opportunity for answering this question. The central argument is that because the EVD outbreak affects jurisdictions beyond domestic boundaries and diverse societal interests, it should be handled through risk governance. An empirical investigation of the adaptive and integrative model of Klinke and Renn (2012) shows that risk governance might contribute new inputs into risk analysis in EVD handling. At the moment, the prevailing EVD handling approach substantially shows elements of risk analysis but lacks the basic elements of risk governance at the domestic level. At the global level, the prevailing approach fully incorporates the elements of risk analysis but not fully those of risk governance. Applying the Klinke and Renn model to augment risk analysis might upgrade the prevailing approach to risk handling, making risk handling outcomes more suitable for stakeholders and individuals. Although the analysis excludes the adaptive aspect and the risk communication, evaluation, monitoring and control elements, it shows the model could make risk analysis more integrative and incorporate risk handling variables more accurately.

Keywords: risk analysis; risk governance; risk handling; epidemics; Ebola virus disease

INTRODUCTION

Epidemic outbreaks affect a broad range of interests within societies, cutting across many sectors, from cultural to economic and from social to political. These interests have socio-political, economic, cultural, legal and ethical ramifications which cannot only be explained by the natural sciences. The nature and diversity of interests that epidemics affect therefore warrant an interdisciplinary approach to their handling and a science-policy intersection. This interdisciplinary approach should encompass the technical inputs of natural scientists and social scientists as well as the non-technical inputs of the society at large (see Lim, 2011). Natural scientists determine issues such as the cause and character of epidemics, while social scientists describe and interpret societal perceptions and reactions and the society provides the day to day experience of people.

The recent crisis of the Ebola Virus Disease (EVD), formerly known as Ebola Hemorrhagic Fever, has revealed the need for the interplay of interests and stakeholders at different levels. Since it emerged at Zaire, now Democratic Republic of Congo (DRC), in 1976, the current outbreak is the first in West Africa, and the 25th globally (Turner, 2014). The current outbreak has affected mainly West Africa, with disassociated cases in other jurisdictions.

There are two major approaches to the handling of risks such as the EVD. The classical approach is risk analysis. This approach is science-based and highly quantitative. The emerging approach is risk governance (Lim, 2011) which appears to be broader as it attempts to provide a holistic approach to risk handling. Like risk analysis with many models, stakeholders and scholars have developed various approaches to risk governance, rejecting the technical-based and top-down government-centered notion of risk handling (Klinke & Renn, 2014).

What does risk governance contribute to risk analysis? The study attempts to answer this question using the EVD as a case study. It aims at offering lessons for epidemic risk governance. The discussion excludes the adaptive aspect of risk governance, and risk communication, monitoring, control and evaluation elements, because of space constraints.

METHOD

The study adopts the adaptive and integrative risk governance model developed by Klinke and Renn (2012) because it has comprehensive elements. Attempt is made to analyze the current EVD risk handling process based on its additions to the risk analysis model.

RESULTS

The risk governance model adds pre-estimation, interdisciplinary risk estimation, risk characterization and evaluation, and risk monitoring and control to risk analysis hitherto having risk assessment, risk management, and risk communication. The goal of pre-estimation is to ascertain the circumstances or early warnings occurring before the estimation or assessment of the risks, and how stakeholders make decisions to frame a situation as a risk (see IRGC, 2008; Klinke & Renn, 2012). These circumstances are usually affected by social-political, economic, cultural, legal, and other societal judgements and contexts (Klinke & Renn, 2012) as the framing

of a problem may vary based on circumstance (Schmidt, 2013). Interdisciplinary risk estimation advocates incorporating the inputs of science and the society at large. The scientific inputs should encompass those of natural scientists and social scientists, while societal inputs come from stakeholders and individuals. Risk characterization and evaluation provides the opportunity for ranking risks, selecting which ones are acceptable, tolerable, and intolerable. Risk monitoring and control attempt to follow-up on risk handling beyond merely communicating the same.

Pre-estimation

The World Health Organization (WHO) and the comity of nations have framed the current EVD outbreak as a threat to public health. The EVD epidemic began at Guinea in December 2013 but was reported to the WHO in March 2014 (Pillai et al., 2014). After receiving reports of the outbreak, the WHO hosted a mission briefing with 101 representatives from member states on 5 August 2014, discussing how to protect public health and the economy (see WHO Regional Office for Africa, 2014). The discussion revealed that the EVD outbreak threatens the affected states beyond any previous outbreak, hence the need to support them and to prevent spill-overs. This framing securitized the EVD and revealed the need for international cooperation for ensuring global health.

Interdisciplinary risk estimation

Interdisciplinary risk estimation involves risk assessment and concerned assessment. Risk assessment is done by technical and scientific experts while concerned assessment takes public perception and contributions into consideration.

Risk assessment

Technical experts have substantially dominated the assessment of EVD in most jurisdictions. Countries and organisations have inaugurated technical institutions and bodies of experts to identify and assess the risks associated with EVD. For example, Liberian Ministry of Health and Social Welfare (MOHSW) developed a national task force and technical expert committee (Pillai, 2014) and the US Centres for Disease Control and Prevention (CDC) of the United States (US) inaugurated a group of experts in New York in September and October 2014 (CDC, 2014).

Experts have identified the Ebola, one of the three members of the filovirus family, closely associated with Marburg Virus which is the second member and with Cueva Virus as the third family member, as the cause of EVD (Peters et al., 1999; Tambo, Ugwu, & Ngogang, 2014). It was first discovered in 1976 at Sudan and Congo, named after the river where it was found, and later reported at Gabon in Central Africa (Tambo et al. 2014). So far, there are five identified species: Zaire, Sudan, Reston, Tai forest, and Bundibugyo (European Centre for Disease Prevention and Control, 2004). Four of these five species cause human illness (Turner, 2014).

Studies have also confirmed that EVD is transmitted primarily and secondarily. Primary transmission occurs through human contact with infected animals, and secondary transmission through direct contact with body fluids of infected persons (WHO, 2014; WHO, 2015). Animal contacts may take forms such as hunting, butchering, and consumption of bush meat. Experts have also established that the EVD spreads through travel, including by air (Gomes et al., 2014). Health workers are considered to be most vulnerable to infection (Turner, 2014).

Experts seem to agree that EVD is deadly, highly transmissible, persistent, cureless, and lacks specific therapy. Its risks are threatening especially because its transmission could move at a rapid speed (see Meltzer et al., 2014). It becomes a serious concern because the outbreak has surpassed all other previous outbreaks as the previous ones did not spread beyond East and Central Africa (Friedman et al., 2014; Gomes et al., 2014). Despite the one-time use of convalescent plasma (Simpson, 1977), and recent use of some experimental vaccines, experts acknowledge that no clinically sanctioned cure exists for EVD yet (Hooker, 2014). However, despite recent failures during vaccine trials (Pollack, 2015; The Canadian Press, 2015), a vaccine has been found to be effective.

Because risk assessment relies on technical inputs which are usually described with measurable precision, it faces the challenges of complexity, uncertainty and ambiguity (see IRGC, 2008), which are considered the three problems of risk knowledge (Klinke & Renn, 2002, 2012). These three problems arise from social circumstances that cannot be measured precisely. Risk problems are complex because they may arise from different sources but be difficult to pin down to one. Uncertainties arise from knowledge gaps that limit the confidence in the causal link drawn between cause and effect. Ambiguity results from the plural interpretations of similar risk problems due to different circumstances and perceptions.

Concerned assessment

In addition to risk assessment, the risk governance model allows for concerned assessment of stakeholders and the general public. Involving this set of players satisfies normative requirements and could lead to a new knowledge base and legitimacy of decisions (see Klinke & Renn, 2012, 2014).

There are few scholarly studies showing the social perceptions of stakeholders and individuals in the countries affected by the current EVD outbreak including Nigeria (Gidado et al., 2014; Umeora, Emma-Echiegu, Umeora, & Ajayi, 2014) and Ghana (see Nyarko et al., 2015). Some also perceive the potential economic effects of the current EVD outbreak as well (The World Bank Group, 2014; Sy & Copley, 2014). These Social and economic dimensions to EVD affect its handling processes and progress (see Jones, 2011). For example, many people in Africa support national control strategies as well as the imposition of international travel restrictions when it comes to EVD (see Kinsman, 2012; see also International SOS, 2014), even though they might oppose such measures in other areas of interest, and some of them are willing to adjust customs to advance the prevention of the EVD (see Sokol, 2002; Kucharski & Piot, 2014), which might not otherwise be the case.

Risk characterization and evaluation

Unlike risk analysis, risk governance has risk characterization and evaluation as additional elements. Both components usually go hand in hand. They involve the combination of technical evidence with societal inputs in making risk decisions (see Todd, 2011, p. 1515). While risk characterization is evidence-based, risk evaluation is value-oriented.

Risk characterization

Experts have identified the cause, extent, ubiquity, limits, fatalities, and threats of the EVD outbreak (WHO, 2014; WHO, 2015; Tambo, Ugwu, & Ngogang, 2014; Peters et al., 1999; WHO Media Centre, 2014E; Grady, 2014).

There were earlier interpretative and normative ambiguities. Some experts have blamed the spread of EVD in West Africa on poor health systems and low capacity for response (Salaam-Blyther, 2014); other experts have identified the African culture as the major barrier to EVD containment (Jones, 2011; for other relevant comments, see Sokol, 2002; Kucharski & Piot, 2014). The extension of the interpretation of EVD risks from the objective to subjective realm illustrates the social ambiguities associated with it.

Risk evaluation

Risk evaluation is another contribution of the risk governance model to risk handling. It considers how stakeholders and the public rank risks and how they make value-based decisions (see Klinke & Renn, 2012). Stakeholders and individuals express the degree of risk 'acceptability', 'tolerability' or 'intolerability,' (IRGC, 2005; Klinke & Renn, 2002, 2012) and risks could range between these degrees, called transition zones, for example when tolerability is disputed (Klinke & Renn, 2012).

The risk of exposure to EVD is clearly not acceptable. However, because the risk of transfer through air travel is considered limited, the risk of importing EVD through air travel appears to range from tolerable to intolerable. The degree of tolerability seems to vary between developed and developing countries, international and domestic, and national and individual levels. The evidence so far shows relatively high tolerability in developed countries, international and national levels, and relatively low tolerability in developing countries, domestic and individual levels. Factors that determine the variability of tolerability may include stakeholder's estimation of risks, the level of technology and resources to deal with risks, and the influence of international organizations and countries in the diplomatic community.

On a global scale therefore, one could say countries regard risks associated with the transfer of EVD through air travel and other forms of immigration as tolerable. WHO as well as other institutions and experts at the international, regional or supranational, and national levels have generally made cases for containment in areas affected, and prevention or protection in countries not affected. The WHO seems to remain at the center of this advocacy and the regulation of containment processes.

Risk management

Risk management is based on the results of the previous stages of risk governance (See Klinke & Renn, 2012), especially the evaluation. The management of acceptable risks becomes part of daily lives usually with no formal intervention necessary, although may be subjected to voluntary risk reduction measures or insurance arrangements; intolerable risks ought to be prevented and prohibited; but tolerable risks and risks whose tolerability is in dispute are subject to risk reduction measures, and so they advance to the risk management stage (see Klinke & Renn, 2012). Tolerable risks such as the travel risks of the EVD are managed based on the results of risk evaluation (see IRGC, 2008, p. 13).

At the domestic level, the Nigerian EVD management approach is acclaimed in the literature. It has a hierarchical layered structure with vertical and horizontal coordinations (see Shuaib et al, 2014). It creates a comprehensive vertical hierarchical network within horizontal layers, integrating technical and societal measures across vertical and horizontal coordination.

CONCLUSION

Unlike risk analysis, risk governance appears to incorporate technical and societal inputs, warranting the engagement of natural, clinical, and social scientists as well as the general public. It also engages a governance approach that allows for the partnership of state and non-state actors including individuals. For these reasons, it may produce accurate results that consider all scientific and non-scientific variables better than the risk analysis model, and outcomes that are more suitable to the risk public. It therefore appears to be an integrative element to risk analysis, incorporating and coordinating all variables and stakeholders.

Given its features, risk governance may be more suitable for handling epidemics than risk analysis. Epidemic outbreaks present unique challenges that risk governance addresses. As minimum features, epidemics spread very fast; their risks are usually not avoidable for most stakeholders and individuals; and it is also common for some epidemics not to have a cure, especially those caused by viruses. Also due to globalization, it is difficult to restrict epidemics to any jurisdiction. Moreover, many interests are affected, most of which reside in individuals and the society at large. Risk governance possesses a better potential for addressing these peculiarities.

REFERENCES

- Beck, U. (1992). *Risk Society: Towards a new modernity*. London: SAGE.
- Beck, U. (1996). World risk society as cosmopolitan society? Ecological questions in a framework of manufactured uncertainties. *Theory, Culture & Society*, 13(4), 1–32.
- Beck, U. (2007). World risk society and the changing foundations of transnational politics. In Grande, E. & Pauly, L. W. (Eds.), *Complex sovereignty: Reconstituting political authority in the twenty-first century* (pp. 22–47). Toronto: University of Toronto Press.
- CDC. (2014). Facts Sheet: CDC taking active steps related to hospital preparedness for Ebola treatment. Retrieved from <http://www.cdc.gov/media/releases/2014/fs1014-ebola-investigation-fact-sheet.pdf>
- CDC. (2015, June 17). 2014 Ebola outbreak in West Africa—Case counts. Retrieved from <http://www.cdc.gov/vhf/ebola/outbreaks/2014-west-africa/case-counts.html>
- European Centre for Disease Prevention and Control. (2004). Outbreak of Ebola virus in West Africa: Fourth update. Retrieved from <http://www.ecdc.europa.eu/en/publications/Publications/Ebola-virus-disease-west-africa-risk-assessment-27-08-2014.pdf>
- Fidler, D. P. (2005). Health as foreign policy: Between principle and power. *Whitehead Journal of Diplomacy and International Relation*, 6(2), 179–194.
- Fidler, D. P. (2010). The challenges of global health governance. Retrieved from http://ec.europa.eu/health/eu_world/docs/ev_20111111_rd01_en.pdf
- Friedman, T. R., Damon, I., Bell, B. P., Kenyon T., & Nichol, S. (2014). Ebola 2014: New challenges, new global response, new global response and responsibility. *The New England Journal of Medicine*, 371(13), 1177–1180.
- Gidado, S., Oladimeji, A. M., Roberts, A. A., Nguku, P., Nwangwu, I. G, Waziri, N. E., ... Poggensee, G. (2015). Public knowledge, perception and source of information on Ebola virus disease- Lagos, Nigeria; September, 2014. *PLOS Current Outbreaks*. Retrieved from <http://currents.plos.org/outbreaks/article/public-knowledge-perception-and-source-of-information-on-ebola-virus-disease-lagos-nigeria-september-2014/>
- Gomes, M. F. C., Piontti, A. P. Y., Rossi, L., Chao, D., Longini, I., Halloran, M. E., & Vespignani, A. (2014). Assessing the international spreading risk associated with the 2014 West African Ebola outbreak. *PLOS Currents Outbreak*, 1. Retrieved from <http://currents.plos.org/outbreaks/article/assessing-the-international-spreading-risk-associated-with-the-2014-west-african-ebola-outbreak/>
- Grady, D. (2014). Ebola Vaccine, Ready for Test, Sat on the Shelf. *The New York Times*. Retrieved from http://www.nytimes.com/2014/10/24/health/without-lucrative-market-potential-ebola-vaccine-was-shelved-for-years.html?_r=0
- Hooker, L. C., Mayes, C., Degeling, C., Gilbert, G. L., & Kerridge, I. H. (2014). Don't be scared, be angry: the politics and ethics of Ebola. *Medical Journal*, 201(6), 352–354.
- International Risk Governance Council. (2005). Risk governance: Towards an integrative [Whitepaper of the International Risk Governance Council]. Retrieved from http://www.irgc.org/IMG/pdf/IRGC_WP_No_1_Risk_Governance__reprinted_version_.pdf
- International Risk Governance Council. (2008). An introduction to the IRGC risk governance framework. Geneva: International Risk Governance Council. Retrieved from

- http://www.irgc.org/IMG/pdf/An_introduction_to_the_IRGC_Risk_Governance_Framework.pdf
- International SOS. (2014). Travel restrictions, flight operations and screening. Retrieved from https://www.internationalsos.com/ebola/index.cfm?content_id=435
- Jones, J. (2011). Ebola emerging: The limitations of culturalist discourses in epidemiology. *Journal of Global Health, 1*, 1–6.
- Kinsman, J. (2012). “A time of fear”: Local, national, and international responses to a large Ebola outbreak in Uganda. *Globalization and Health, 8*(15), 1–12.
- Klinke, A., & Renn, O. (2002). A new approach to risk evaluation and management: Risk-based, precaution-based and discourse-based strategies. *Risk Analysis, 22*(6), 1071–1094.
- Klinke, A., & Renn, O. (2012). Adaptive and integrative governance on risk and uncertainty. *Journal of Risk Research, 15*(3), 273–292.
- Klinke, A., & Renn, O. (2014). Expertise and experience: A deliberative system of a functional division of labor for post-normal risk governance. *Innovation: The European Journal of Social Science Research, 27*(4), 442–465.
- Kucharski, A. J., & Piot, P. (2014). Containing Ebola virus infection in West Africa. *Eurosurveillance, 19*(36). Retrieved from <http://eurosurveillance.org/ViewArticle.aspx?ArticleId=20899>
- Lim, W. (2011). Understanding risk governance: Introducing sociological neoinstitutionalism and foucauldian governmentality for further theorizing. *International Journal of Disaster Risk Science, 2*(3), 11–20.
- Meltzer, M. I., Atkins, C. Y., Santibanez, S., Knust, B., Petersen, B. W., Ervin, E. D., ... Washington, M. L. (2014). Estimating the future number of cases in the Ebola epidemic—Liberia and Sierra Leone, 2014–2015. *Supplements, 63*(03), 1–14. Retrieved from <http://www.cdc.gov/mmwr/preview/mmwrhtml/su6303a1.htm>
- Nyarko, Y., Goldfrank, L., Ogedegbe, G., Soghoian, S., Aikins, A. & NYU-UG-KBTH Ghana Ebola Working Group. (2015). Preparing for Ebola virus disease in West African countries not yet affected: Perspectives from Ghanaian health professionals. *Globalisation and Health, 11*(7). <http://www.globalizationandhealth.com/content/pdf/s12992-015-0094-z.pdf>
- OECD. (2003). *Emerging systemic risks*. Final report to the OECD futures project. Paris: OECD.
- Peters, C. J., & LeDuc J. W. (1999). Introduction to Ebola: The virus and the disease. *The Journal of Infectious Diseases, 179*, ix-xvi. Retrieved from http://jid.oxfordjournals.org/content/179/Supplement_1/ix.full.pdf+html
- Pillai, S. K., Nyenswah, T., Rouse, E. Arwady, M. A., Forrester, J. D., Hunter J. C. & Matanock, A. (2014, October 17). Developing an incident management system to support Ebola response—Liberia, July–August 2014. *Morbidity and Mortality Weekly Report, 63*(41), 930–933.
- Pollack, A. (2015, June 19). Clinical trial of experimental Ebola drug is halted. *The New York Times*. Retrieved from http://www.nytimes.com/2015/06/20/health/clinical-trial-of-experimental-ebola-drug-is-halted.html?_r=0
- Shuaib, F. Gunnala, R. Musa, E. O., Mahoney, F. J., Oguntimehin, O., Nguku, P. M., Nyanti, S. B., et al. (3 October 2014). Ebola virus disease outbreak—Nigeria. (2014, October 3). *Morbidity and Mortality Weekly Report (MMWR) 63*(39), 867–872.

- Simpson, D. I. H. (1977). Marburg and Ebola virus infections: A guide for their diagnosis, management, and control. *WHO offset Publication 36*. Retrieved from http://whqlibdoc.who.int/offset/WHO_OFFSET_36.pdf
- Sokol, D. K. (2002). From Anonymity to notoriety: historical problems associated with outbreaks of emerging infectious diseases; a case study: Ebola haemorrhagic fever (Unpublished master's dissertation). University of Oxford, Oxford. Retrieved from <http://www.medicalethicist.net/documents/SokolThesis.pdf>
- Sy, A. & Copley, A. (2014, October 1). Understanding the economic effects of the 2014 Ebola outbreak in West Africa. Brookings: Africa in Focus. Retrieved from <http://www.brookings.edu/blogs/africa-in-focus/posts/2014/10/01-ebola-outbreak-west-africa-sy-copley>
- Tambo, E., Ugwu, E. C., Ngogang, J. Y. (2014). Need of surveillance response systems to combat Ebola outbreaks and other emerging infectious diseases in African countries. *Infectious Diseases of Poverty*, 3(29), 1–7.
- The Canadian Press (2015, June 19). Canadian Ebola drug trial stopped: No overall benefit shown from Tekmira's Ebola drug. CBC News. Retrieved from <http://www.cbc.ca/news/health/canadian-ebola-drug-trial-stopped-1.3119990>
- The World Bank Group. (2014). The Economic impact of the 2014 Ebola epidemic: short and medium term estimates for West Africa. Retrieved from <http://reliefweb.int/sites/reliefweb.int/files/resources/912190WP0see0a00070385314B00PUBLIC0.pdf>
- Turner, C. R. N. (2014). Ebola virus disease. *Nursing*, 44(9), 68–69.
- Umeora, O. U. J., Emma-Echiegu, N. B., Umeora, M. C. & Ajayi, N. (2014). Ebola virus disease in Nigeria: The panic and cultural threat. *African Journal of Medical and Health Sciences*, 13(1), 1–5.
- WHO Media Centre (2014E, August 12). Ethical considerations for use of unregistered interventions for Ebola virus diseases (EVD). Retrieved from <http://www.who.int/mediacentre/news/statements/2014/ebola-ethical-review-summary/en/>
- WHO Media Centre. (2014A, October 20). WHO declares end of Ebola outbreak in Nigeria. Retrieved from <http://www.who.int/mediacentre/news/statements/2014/nigeria-ends-ebola/en/>
- WHO Media Centre. (2014B, October 1). Experimental Ebola vaccines. Retrieved from <http://www.who.int/mediacentre/news/ebola/01-october-2014/en/>
- WHO Media Centre. (2014C, August 8). WHO statement on the meeting of the international health regulations emergency committee regarding the 2014 Ebola outbreak in West Africa. Retrieved from <http://www.who.int/mediacentre/news/statements/2014/ebola-20140808/en/>
- WHO Media Centre. (2014D, October 17). The outbreak of Ebola virus disease in Senegal is over. Retrieved from <http://www.who.int/mediacentre/news/ebola/17-october-2014/en/>
- WHO Media Centre. (2014, June). Ebola and Marburg virus disease epidemics: Preparedness, alert, control, and evaluation. Retrieved from http://www.who.int/csr/disease/ebola/PACE_outbreaks_ebola_marburg_en.pdf
- WHO Media Centre. (2015). Ebola virus disease. Retrieved from <http://www.who.int/mediacentre/factsheets/fs103/en>

STUDENTS' AGENTIC ENGAGEMENT WITHIN PROJECT-BASED LEARNING

Selvi Roy

University of Prince Edward Island, Prince Edward Island, Canada

Abstract

Student engagement at the high school level is imperative and has been emphasized for two primary reasons. First, to enhance learning outcomes, and second to enhance graduation rates. Overall, student engagement and student learning are synced and are intrinsic to education. Extant literature discusses student engagement as being comprised of three to three major dimensions - affective, behavioral, and cognitive. Students' agentic engagement is an emergent concept that encompasses their constructive and critical contributions to the learning process. This newer dimension of student engagement promotes student voice and subsumes significant elements of the previously discussed dimensions of student engagement. Project-Based learning fosters authentic hands-on and minds-on group activities, and students' agentic engagement through its student directed learning design. While project-based learning has been gaining popularity as a pedagogical strategy, limited studies are available on students' agentic engagement. Through videoethnography this study explores expressions of and factors influencing students' agentic engagement within project-based learning in a high school setting. Data for this study is drawn from two grade ten English Language Arts class students who participated in a curricular innovation designed by the Digital Economy Research Team headed by faculty in the University of Prince Edward Island. Initial findings present students' agentic engagement as a multi-stage phenomenon categorized as the recipient stage, partnership stage and ownership stage of agentic engagement.

Keywords: Agentic engagement, project-based learning, videoethnography

INTRODUCTION

This conference paper presents key findings from the author's Ph.D. study on high school students' agentic engagement within project-based learning (PBL). The study's genesis lies in a larger visionary project initiated by the Digital Economy Research Team, acronymed the DERT project at the University of Prince Edward Island (UPEI). First a background is presented to situate and highlight the significance of this study. Next, a brief discussion on project-based learning and agentic engagement is provided. Following this is a presentation of key findings. A globalized economy with ubiquitous technology demands netizens to be self-directed lifelong learners capable of working independently and collaboratively in a variety of settings—digitized and non-digitized environments, at institutions of higher education and the workplace. A major contribution of this study is that it positions students as key stakeholders in their learning and acknowledges their potential and actual contribution to their learning.

RATIONALE

Inspiration for this study came from a personal experience many years ago when my daughter clarified to me that her teacher's fears about her possibly being sleep deprived and at times yawning in class, may actually be a result of her boredom. This incident led me as a mother, and a professional social worker and educator to explore pedagogical strategies for enhancing student engagement. My explorations revealed that my daughter was not alone in experiencing boredom and disengagement at school. Disengagement and boredom in school is a worldwide phenomenon often resulting in students' organically dropping out or staying in school merely for mandated reasons with minimal to nil involvement in their learning thus impeding their learning and overall development.

CONTEXT

The recent 2009 High School Survey of Student Engagement from the USA revealed that 49 percent of high school students surveyed were bored every day, and 66 percent were bored at least every day (Yazzie-Mintz, 2010). According to the author, this survey had recorded responses from more than 42,000 high school students from 103 schools, spanning 27 states in the USA, and since 2006 had gathered information from more than 300,000 students with similar results. Within PEI, dropout rates are reducing and graduation rates are increasing for a number of reasons. Statistics Canada (2010) reported that the high school dropout rate in Canada has halved since 1990/1991 when it was 16.6 percent to 8.5 percent; and a similar drop was reported in PEI where the three-year average in 1990-1993 reduced from 18.9 percent to 8.9 percent during 2007-2010. Despite these improvements, the implications in terms of individual lives and communities affected in the immediate and long term are significant. Added to this number of students who have dropped out of school is the unknown yet real number of students who attend school ritualistically and are disengaged from active learning.

While the steep decrease in dropout rates sounds encouraging, the actual number and individual lives represented by the percentages calls for concern. The social and economic costs to both the individuals and society at large due to students either dropping out or feeling forced out of school is enormous in terms of calculable and sometimes incalculable loss resulting from

unemployment; underemployment; enhanced health care costs, poor lifestyle choices; increased social security costs, and heightened incarceration related costs (Hankivsky, 2008; Henry, Knight, & Thornberry, 2011). Added to this are the unknown yet real numbers of students who stay in school yet are disengaged from meaningful learning that only serve to deepen the socio-economic impact due to unfulfilled human potential.

Students need conscious nurturing and appropriate scaffolding to participate fully in their education. Encouraging students to express their voice and ask critical questions of the subject matter and the purpose of education are important pedagogical responsibilities. Kincheloe (1985) explained that "... students who can understand that education is much more than inculcation of facts and 'essential' knowledge and who can question why the facts are taught in certain ways are certain to be more thoughtful students" (p. 48). Learning environments and pedagogical strategies that hone students' critical thinking capacities and provide space for their agentic expression facilitate the development of conscientized individuals. Also, educational settings that promote inquiry-based learning and mirror real-life scenarios tend to increase student engagement. Project-Based learning (PBL) is an inquiry-based student-centered pedagogy that fosters authentic hands-on and minds-on group activities, and students' agentic engagement through its student directed learning design.

Student engagement at the high school level is imperative and has been emphasized for two primary reasons. First, to enhance learning outcomes and, second, to enhance graduation rates. Overall, student engagement and student learning are synced and are intrinsic to education. Within academic or school settings, extant literature discusses engagement as being comprised of three dimensions—cognitive, affective, and behavioral. Students' agentic engagement is an emergent concept that encompasses their constructive and critical contributions to the learning process. This newer dimension of student engagement promotes student voice and subsumes significant elements of the previously discussed dimensions of student engagement. According to Reeve and Tseng (2011) agentic engagement is "Students' constructive contribution into the flow of the instruction they receive" (p. 258). In keeping with this understanding of students' roles, agentic engagement has been defined as, "Students' critical and constructive contribution to their own and peer learning." Given this definition, agentic engagement subsumes major aspects of the previous three dimensions of engagement. Embedded in agentic engagement is the ability of students to express their voice, participate, and contribute towards their own and peer's learning.

OBJECTIVE

When students are acknowledged and recognized for their potential and contribution to further their own and peer learning, their sense of worth is enhanced and their learning is deepened. In a ripple effect, this feeling of 'worth' and ability to contribute to one's own and others' learning contributes to greater engagement in the other three dimensions besides contributing to enhanced learning. This fourth dimension of student engagement or students' agentic engagement was the focus of this study. In terms of pedagogical strategies conducive for promoting student engagement, PBL has been gaining popularity, yet, limited studies are available on students' engagement in general and students' agentic engagement in particular.

Thus this study explored pedagogical strategies among other environmental variabilities that influenced students' agentic engagement.

DESIGN

The DERT project was a multi-stakeholder, multi-site project that envisaged an innovative curriculum to enhance students' digital and multiliteracies while retaining traditional text-based skills to position students for success in their lives after graduation. The DERT project headed by Drs. Sean Wiebe, Ron MacDonald, Martha Gabriel, Sandy McAuley, and Barbara Campbell from UPEI adopted a threshold concepts' heuristic within project-based learning in two high schools and three community college sites in Prince Edward Island (PEI). Data collected from one high school in PEI as part of the DERT project formed the basis of the Ph.D. study. Participants in this study were students from two grade ten English Language Arts classes at this high school. Five professional creative arts experts enlisted with CulturePEI mentored students from the two grade ten classes who formed sixteen groups of students (ten small groups of three to five students, and six groups of one student) to create projects of their choice in a wide range of genres ranging from short film, animation, puppetry, short story writing, and mural painting to stage play. The creative arts experts or mentors acted in lieu of the teacher as they scaffolded students towards project design and creation within a PBL setting.

Data for this project was collected twice a week through videorecording from each of the groups over a nine-week semester in 2013 and spanned over 51 hours. Field notes from direct observation added to the data. Through videoethnography of two purposefully drawn case studies from among the sixteen groups of students, and analytic induction, this study explored expressions of and factors influencing students' agentic engagement within project-based learning in a high school setting.

FINDINGS

Some of the key findings of this study are that students' agentic engagement is a multi-staged, fluid and dynamic, non-unilateral phenomenon comprising the recipient stage, partnership stage and ownership stage of agentic engagement. At the base of the stages of agentic engagement is the recipient stage, where students are unaware of their agency, believe that their role as a learner is equivalent to a beneficiary in the education system and they need to be passive recipients of knowledge. Students at this stage are involved robotically in school-related activities. The next stage is a nascent stage of agentic engagement and students participate enthusiastically by receiving prompts, suggestions and ideas from the teacher and peers. The pinnacle of agentic engagement is reflected in the ownership stage where students take initiative, give ideas and suggestions to peers and the teacher and invest extra effort and time without explicit directions. Agentic engagement expressed by students was also found to be influenced by other environmental variabilities such as context, time, interpersonal relations and intrapersonal aspects—especially social capital and habitus, and pedagogical strategies—particularly the nature of scaffolding offered. These environmental variabilities are discussed in subsequent papers.

REFERENCES

- Hankivsky, O. (2008). Cost estimates of dropping out of high school in Canada [Report]. Canadian Council for Learning. Retrieved from <http://www.ccl-cca.ca/pdfs/OtherReports/CostofdroppingoutHankivskyFinalReport.pdf>
- Henry, K. L., Knight, K. E., & Thornberry, T. P. (2012). School disengagement as a predictor of dropout, delinquency, and problem substance use during adolescence and early adulthood. *Journal of Youth Adolescence, 41*(2), 156–166. doi:10.1007/s10964-011-9665-3
- Kincheloe, J. L. (1985). Educational Studies as a component of the Social Studies curriculum. *The High School Journal, 69*(1), 46–49.
- Reeve, J., & Tseng, C.–M. (2011). Agency as a fourth aspect of students' engagement during learning activities. *Contemporary Educational Psychology, 36*, 257–267.
- Statistics Canada. (2010). *Trends in Dropout Rates and the Labour Market Outcomes of Young Dropouts*. Retrieved from <http://www.statcan.gc.ca/pub/81-004-x/2010004/article/11339-eng.htm>
- van Lier, L. (2008). Agency in the Classroom. In J. P. Lantolf & M. E. Poehner. (Eds.). *Sociocultural Theory and the Teaching of Second Languages*. (pp. 163–186). London, the United Kingdom: Equinox.
- Yazzie-Mintz, E. (2010). Charting the path from engagement to achievement: A report on the 2009 High School Survey of Student Engagement. Bloomington, IN: Center for Evaluation & Education Policy. Retrieved from http://ceep.indiana.edu/hssse/images/HSSSE_2010_Report.pdf

SHIFTING PARADIGMS: VARIATION AND LEITMOTIFS IN THE FINAL FANTASY XIII TRILOGY

Alexander Simon

University of Victoria, British Columbia, Canada

Abstract

The music of the *Final Fantasy XIII* trilogy is an important element of the narrative. Analyzing the recurring motives not only supports the development of the story, but also connects other elements of the game series for the players (such as game mechanics and aesthetics). Existing musical theory will be sufficient for analyzing the *Final Fantasy XIII* trilogy as a multi-media artwork. An in-depth study will help to highlight the similarities between music normally separated into “art” and “popular,” and bring more current game music repertoire into discussion.

Keywords: video games, music, leitmotif, multi-media art

Academic research on video games is still in its infancy, but has begun to grow in the last few years. At this point the literature focuses mostly on the technical and social aspect of games, or elements of gaming that are unique to the medium. There has been little exploration of the music of games from the music theoretical aspect, rather than the technical or user interactivity aspects. In the autumn of 2013 when this research first began the majority of sources of analyses were published on personal blogs, such as Matthew Thompson's Video Game Music Nerd blog; the only major piece of academic analytical work was Guillaume Laroche's (2012) thesis on variation in the *Super Mario Bros.* series. His work sets a precedent for game music analysis and details many of the problems faced by those who wish to analyze game music.

My research aims to fulfill several goals, among them being: to add to the growing academic literature on video games, to help populate the small selection of research dealing with game music analysis, to help foster discussion in a setting where video games are generally not taken seriously, and to bring discussion of more recent games to the fore.

To that end I have begun an analysis of the three games in the *Final Fantasy XIII* trilogy, published by Japanese developer Square Enix: *Final Fantasy XIII* (2009), *Final Fantasy XIII-2* (2011), and *Lightning Returns: Final Fantasy XIII* (2014). Beyond presenting the theory of the music in these games, the analyses will detail the progression of various themes that are reused throughout the series in terms of character development and narration. This is not dissimilar to the analysis of leitmotifs in operatic works since Wagner, and it will be shown that the same tools can be used to analyze these multi-media works of art.

To begin, a list of all major recurring themes from the series was compiled. To qualify for this list, the piece must have a theme or motive that is reused in some form in more than one other piece and have some significance to the plot, narrative, or characters of *Final Fantasy XIII*.

The themes with the most significance to the series are the following characters and their associated music: Lightning Farron, Serah Farron, Noel Kreiss, Paddra Nsu-Yeul, Caius Ballad, and Hope Estheim. There is also the *Prelude to Final Fantasy XIII* and *Paradox*, which serve as global themes for the first and second games, respectively, and *Final Fantasy XIII -The Promise*, which is both a global theme, and, for the first game, associated with Serah.

Lightning's theme is by far the most significant for the series. It was the first piece of music for the series revealed, and its themes are reused in over 45 tracks, or approximately 1/5th of the soundtracks of the three games combined. Table 1 is an excerpt of the list of recurring themes, showing which tracks reuse elements of the theme *Blinded by Light*.

In *Final Fantasy XIII* the “original” theme *Blinded by Light* is the music that is played during all regular enemy encounters. The piece *Lightning's Theme* is a variation on this, but it is only through the second and third games that *Blinded by Light*'s themes come to be more associated as a character theme rather than a global one. For instance, in *Final Fantasy XIII*, variations on the themes appear during story segments that are not Lightning-centric, and, in fact, the coda appears in *Fang's Theme*, suggesting that *Blinded by Light* was supposed to be more of an all-encompassing piece of music rather than a personal theme for Lightning. By the final game in the series, the developers had shifted the focus to telling a very personal story about

Lightning, evidenced by the fact that her name is in the title, she is the only playable character in the game, and they began referring to the trilogy as the Lightning Saga.

The list of recurring themes reveals some trends. *Blinded by Light*, *Prelude to Final Fantasy XIII* and *Final Fantasy XIII -The Promise-* all feature heavily in the first game; with the shift towards a more character-focused game in the sequel, the *Prelude* and *The Promise* all but disappear, as they were intended as global themes for the world of Final Fantasy XIII, which has changed dramatically in the in-world 3-year timespan between games. Both the *Prelude* and *The Promise* reappear in the final game as a way of tying the story together. *The Promise* is notably absent from *XIII-2*, as it originally acted partly as Serah's theme, but since she has her own proper theme in *XIII-2*, it is no longer needed.

The *Final Fantasy XIII* trilogy is a unique opportunity in the series to study the presentation and development of themes because it is the only time in the history of the *Final Fantasy* games that a composer has written music for all instalments of a sub-series. Until *Final Fantasy IX*, Nobuo Uematsu was the only composer for the franchise, but he only ever scored the music for one of the spinoffs in that era. On the other hand, Masashi Hamauzu, who composed the soundtrack for *Final Fantasy XIII*, also scored *Final Fantasy XIII-2* and *Lightning Returns: Final Fantasy XIII*; Naoshi Mizuta and Mitsuto Suzuki were co-composers to Hamauzu for the second and third games.

Figure 1 shows a transcription of the main melodic and rhythmic ideas in *Blinded by Light*. The piece itself is in binary form, meaning it has two distinct halves; it is rounded out by an introduction and a coda. The individual sections are described below.

The piece begins with a rhythmic introduction in the low strings, characterized by pulses grouped into beats of 3+3+3+3+2+2, and an ostinato figure in the middle register repeating a two-note chord (shown in the first system of Figure 1).

The A theme is divided into two sections: an antecedent and a consequent, both in f# minor; the first ends inconclusively (second system), and the second ends with a lead-in to the B theme (third system); there is a short rising motive, foreshadowing the main rising motive in the next section. The A and B themes are also connected through the pitch-class sets that begin each section. The A section begins with the interval collection [0, 5, 7]—that is, there are five semitones from the lowest note to the next one above it, and seven between the lowest and the highest. The B section opens with the set [0, 2, 7], which is the inverse of [0, 5, 7] and also its best normal form—or the most compact way of writing that interval collection.

The B theme is in a new key area, A major, and has three phrases (fourth through sixth systems). Each phrase begins with the same rhythmic material and each concludes with a unique rising motive; the third phrase modulates to D major.

The coda is rhythmically and melodically distinct from the A and B themes; the first half contains a slow turn figure around the note E (final system, first measure), and concludes with two short falling figures as the rhythmic figure from the introduction reappears to connect the loop.

Figure 1 provides the basic building blocks for analyzing other pieces from the trilogy in relation to *Blinded by Light*, from near-quotations such as in *Tears of the Goddess*, from *Final Fantasy XIII-2*, which uses the first section of the B theme with a more even rhythm; to more obscure references, as in *Sunset Prism*, from *Lightning Returns*, which requires the application of the interval set analysis of the A and B themes along with its relationship to the turn figure in the coda.

In addition to the application of music theory to video game soundtracks, I am concurrently exploring other avenues of expanding the discussion of video games in academic settings. My graduating composition for my Master of Music at the University of Victoria used “video games as contemporary folklore” as the basis for its creation and the original libretto that accompanied it. Beyond discussing video gaming as its own medium and how it relates to other art, it is also time to explore how this form of multi-media has influenced young artists.

Table 1

Excerpt from the list of recurring themes, showing the list of pieces that use some elements of Blinded by Light.

Blinded by Light	Final Fantasy XIII-2	Lightning Returns: Final Fantasy XIII
<i>Final Fantasy XIII</i>		
Defiers of Fate Blinded by Light March of the Dreadnoughts Escape Crash Landing Lightning's Theme To Hunt L'Cie Desperate Struggle Fang's Theme Dust to Dust Sinful Hope Determination Ending Credits	Warrior Goddess Etro's Champion Divine Conflict An Arrow Through Time A World Without Cocoon Lightning's Theme -Unprotected Future- Etro's Gate Tears of the Goddess Promise to the Future Closing Credits	Lightning Returns The Final 13 Days Lightning's Theme -A Distant Glimmer- Chaos Crimson Blitz Salvation's Fanfare Sunset Prism The Cathedral Noel and Yeul -The Promise- The Showdown K.O. Savior of Souls Lumina's Theme The Song of the Savior -The Chosen One- The Song of the Savior -Grand Finale- Yusnaan Palace Lightning's Theme -Radiance- Beginning of the End A New World The Divine Dream Last Resort Claire Farron Humanity's Tale Credits – Light Eternal Epilogue

Figure 1. A transcription of the main melodic and rhythmic elements in *Blinded by Light*.

Blinded by Light

breakdown of core elements

Masashi Hamauzu

introduction

rhythmic figure *steady pulse*

A theme

[0, 5, 7]

rising motive

B theme

[0, 2, 7] *extension of rising motive*

extension of rising motive

extension of rising motive

coda

return of introduction

REFERENCES

- Berg, T. (2013). Game Music Theory. Retrieved from <http://gamemusictheory.tumblr.com>
- Brame, J. (2011) Thematic Unity Across a Video Game Series. *Act. Zeitschrift für Musik & Performance*, issue 2. Retrieved from http://www.act.uni-bayreuth.de/en/archiv/2011-02/02_Brame_Thematic_Unity/index.html
- Collins, K. (Ed.). *From Pac-Man to Pop Music: Interactive Audio in Games and New Media*. Aldershot, UK: Ashgate.
- Final Fantasy Wiki. (2013). Final Fantasy XIII: Original Soundtrack. Retrieved from http://finalfantasy.wikia.com/wiki/Final_Fantasy_XIII:_Original_Soundtrack
- Hamauzu, M. (2009). *Final Fantasy XIII Original Soundtrack*. [CD]. Japan: Square Enix Music.
- Hamauzu, M., Mizuta, N., & Suzuki, M. (2011). *Final Fantasy XIII-2 Official Soundtrack*. [CD]. Japan: Square Enix Music.
- Hamauzu, M., Mizuta, N., & Suzuki, M. (2013). *Lightning Returns Original Soundtrack*. [CD]. Japan: Square Enix Music.
- Laroche, G. (2012). *Analyzing musical Mario-media: Variations in the music of Super Mario video games* (Unpublished master's thesis). McGill University, Montreal, Canada.
- Simon, A. (2015). 外伝 (Gaiden). Retrieved from <http://uvic.academia.edu/AlexanderSimon>
- Thompson, M. (2012). Analysis: Final Fantasy VII Leitmotifs [Web log post]. Retrieved from <http://videogamemusicnerd.blogspot.ca/2012/11/analysis-final-fantasy-vii-leitmotifs.html>
- Whalen, Z., & Taylor, L.N. (Eds.). (2008). *Playing the past: History and nostalgia in video games*. Nashville, TN: Vanderbilt University Press.

AN INTERPRETATIVE PHENOMENOLOGICAL ANALYSIS OF THE EXPERIENCES OF STUDENTS REQUIRING TERTIARY LEVEL BEHAVIOR SUPPORT WITHIN INCLUSIVE HIGH SCHOOL SETTINGS

Kristijana Tanfara

University of New Brunswick, New Brunswick, Canada

Abstract

The proposed study will investigate the experiences of high school students with significant emotional-behavioral challenges who require individualized positive behavioral support within an inclusive secondary school setting. The experiences of three adolescent youth receiving tertiary level of behavior support will be recorded using a semi-structured interview method and analyzed using an interpretative phenomenological inquiry method. According to the literature, implementing a Positive Behavior Intervention Support (PBIS) framework in a school promotes appropriate behavior development among students and ensures that a positive learning environment is maintained (Flannery, Fenning, Kato & McIntosh, 2014; Feuerborn, Wallace & Tyre, 2013). Students with significant emotional and behavioral challenges, who struggle with maintaining appropriate conduct in an inclusive learning environment, require a wraparound system of intensive and individualized behavior education supports to have success in high school (Lane, Oakes, Menzies, Oyer, & Jenkins, 2013). This presentation will examine how the NB education system is providing for these students. Inclusion policies and positive behavior support frameworks are generally accepted as effective strategies for all students but missing from the literature is the voice of the youth for whom these targeted support services are designed. The study will be important to the field of behavior support research and education because it will provide student perspectives on the efficacy of implementing positive behavior intervention support while following inclusive educational practices in a provincial high school.

Keywords: Inclusion, Positive Behavior Intervention Support (PBIS), tertiary support, phenomenology.

INTRODUCTION

Approximately seven percent of Canadian female students and ten percent of male students did not graduate from high school in 2010 (Statistics Canada, 2011) because they will disengage from school by the time they reach grade 10 (De Wit, Karioja, & Rye, 2010). Disengagement from school is often a precursor to the decision to drop out, and so the quest of scholars, educators and policy makers continues to be for a better understanding of why certain students do not graduate from high school. The premise of this study is to investigate the perspective of disengaged students receiving individualized behavior support, referred to as tertiary support, in an inclusive secondary education setting. This research will consider evidence from a review of literature on inclusive secondary school systems, Positive Behavior Intervention Support (PBIS), and issues with youth who have characteristics of internalizing and/or externalizing behavior disorders.

RESEARCH QUESTION

The ability to provide specialized support to emotionally and behaviorally struggling students in an inclusionary environment may pose significant challenges for an education system, which factors considerably in student success, especially while positive behavior interventions are implemented in an inclusionary setting (Green et al., 2012). Considering the high risk of disengagement in secondary school settings, this phenomenological inquiry seeks the answer, what are the experiences of students who are currently completing their secondary education while also needing tertiary level of positive behavior intervention and supports within an inclusive high school setting? There is a significant gap in the research on successful high school engagement interventions, and an even greater paucity of evidence from the perspective of the youth affected by this phenomenon. The experiences of three New Brunswick high school youth may provide much needed evidence from a different vantage point of what strategies are effective in producing more high school graduates.

ADOLESCENT EMOTIONAL AND BEHAVIORAL CHALLENGES: INTERNALIZING & EXTERNALIZING ISSUES

Providing students who struggle emotionally and behaviorally with the opportunities to learn cooperative social skills in inclusive educational settings requires an understanding of internalizing and externalizing behavior issues. Anxiety and depression are typical internalizing behaviors, classified as excessive and over-controlled response style, manifesting as an inward regulation of negative emotions, and observed as secretive and covert in nature (Allison, Nativo, Mitchell, Ren, & Yuhasz, 2013; Lane, Oakes, Menzies, Oyer, & Jenkins, 2013; Perle, Levine, Odland, Ketterer, Cannon, & Marker, 2013; Lane, Kahlberg, Lambert, Crnabori, & Bruhn, 2010). Aggression is a complex externalization of under-controlled and impulsive behavior, characterized as overt in nature used either for proactive, self-serving motives or reactive and defensive responses (McMahon, Todd, Martinez, Coker, Sheu, Washburn, & Shah, 2013; Allen, 2010; Reynolds & Repetti, 2010; Wyatt, 2010). Understanding the function of emotions and behavior may identify effective strategies for shaping student misconduct into positive behavior, particularly in a diverse classroom environment (Lane, Oakes, Menzies, Oyer, & Jenkins, 2013; Fallon, O'Keefe, & Sugai, 2012).

POSITIVE BEHAVIOR INTERVENTION SUPPORT (PBIS)

Students who need emotional and behavioral support in order to contribute responsibly to their classroom have benefited from Positive Behavior Intervention Support (PBIS), a three-tiered framework of evidence-based behavior strategies modeled on prevention, data collection and evidence of success (Flannery, Fenning, Kato, & McIntosh, 2014; Feuerborn, Wallace, & Tyre, 2013; Lane, Oakes, Menzies, Oyer, & Jenkins, 2013; Reinke, Stormont, Clare, Latimore, & Herman, 2013; Bohanon et al., 2012; Fallon, O’Keefe, & Sugai, 2012; Mitchell, Stormont & Gage, 2011). The focus of the PBIS framework is on identifying a specified set of behavior expectations that are taught and encouraged on a school-wide basis. This is a universally applied initiative that is preventative in nature and believed to be effective for 71% of high school students (Simonsen et al., 2011). Secondary level support provides reinforcement of behavior expectations in a small group setting to students who demonstrate a need for it. Approximately five percent of students in a typical school population will need individualized or tertiary level, support, to cultivate pro-social skills (Fallon, O’Keefe & Sugai, 2012). This behavior support framework includes a network of support agencies, home, and school consistently collaborating so that the student may be guided to experience success (Davis, Durand, Fuentes, Dacus, & Blenden, 2014; Feuerborn et al., 2013; Gann et al., 2013; Bohannon et al., 2012; Solnick & Ardoin, 2010).

INCLUSIONARY SCHOOL POLICIES

Successful inclusion will have adjusted the features of the learning environment for students by removing sensory, cognitive, and motor barriers rather than attempting to fix a learner’s abilities (Weigert, 2015; Katz & Sugden, 2013; Graham & Harwood, 2011). Classrooms of inclusive schools will include same-aged students who have not been grouped based on academic and behavioral abilities (Liasidou & Antoniou, 2013; Morcom & MacCallum, 2011). Students in this setting are expected to engage in pro-social behavior and to conduct themselves in an appropriate manner, ensuring that a positive learning environment is maintained for all learners. The ultimate goal for an inclusion policy is to address both an individual’s capacity and the conditions of the environment as complete components of access to a student’s academic and social development (Graham & Harwood, 2011). Goransson et al. (2011, p. 542–543) posited that “inclusion became a quest for creating a whole, which from the outset, was based on these factors: children are different, and these differences are considered as assets rather than liabilities.” This construct of an ideal learning community is presented by some scholars as a holistic public education that shapes its students into mindfully involved and responsible citizens (Katz & Sugden, 2013; Morcum & MacCallum, 2012; Graham & Harwood, 2011; Paliokosta & Blandford, 2010).

METHODOLOGY

“When people are having major experiences and facing big issues, the multidimensional aspect of their response to that experience comes to the fore and so a holistic phenomenological analysis is particularly apposite” (Smith et al., 2009, p. 34). For this study, an Interpretative Phenomenological Analysis (IPA) approach will be used to process a “detailed examination of

the human lived experience” (Smith, Flowers & Larkin, 2009, p. 32) and may allow for an exceptional opportunity to draw from the student perspective. A qualitative research methodology using a hermeneutic inquiry as such is anticipated to provide an in-depth glimpse into the experiences of three New Brunswick secondary school students who require intensive, individualized behavior support for successful completion of high school. Evidence-based systematic screening and identification systems will provide this study an empirically sound method of selecting the small sample size of three participants from the local high school population (Lane, Kahlberg, Menzies, Bruhn, Eisner, & Crnobori, 2011; Kahlberg, Lane, & Menzies, 2010; Lane, Kahlberg, Lambert, Crnobori, & Bruhn, 2010). Gathering this empirical data may provide researchers and educators a better understanding of how inclusionary policies and positive behavior interventions may support the development of students at a high risk for school disengagement. Among the most anticipated outcomes of this study would be to gain a better understanding of how schools may manage to keep their most challenging youth engaged and on a path of success from school to community, and finally into their future.

REFERENCES

- Allen, K. P. (2010). A bullying prevention system: Reducing risk and creating support for aggressive students. *Preventing School Failure, 54*(3), 199–209. doi:10.1080/10459880903496289
- Allison, V. L., Nativio, D. G., Mitchell, A. M., Ren, D., & Yuhasz, J. (2013). Identifying symptoms of depression and anxiety in students in the school setting. *The Journal of School Nursing, 30*(3), 165–172. doi: 10.1177/1059840513500076
- Bohanon, H., Fenning, P., Hicks, K., Weber, S., Their, K., Aikins, B., ... Irvin, L. (2012). A case example of the implementation of school wide positive behavior support in a high school setting using change point test analysis. *Preventing School Failure, 56*(2), 91–103. doi:10.1080/1045988X.2011.588973
- Davis, T. N., Durand, S., Fuentes, L., Dacus, S., & Blenden, K. (2014). The effects of a school-based functional analysis on subsequent classroom behavior. *Education and Treatment of Children, 37*(1), 95–110.
- De Wit, D. J., Karioja, K., & Rye, B. J. (2010). Student perceptions of diminished teacher and classmate support following the transition to high school: Are they related to declining attendance? *School of Effectiveness and School Improvement, 21*(4), 451–472. doi:10.1080/09243453.2010.532010
- Fallon, L. M., O'Keefe, B. V., & Sugai, G. (2012). Consideration of culture and context in school-wide positive behavior support: A review of current literature. *Journal of Positive Behavior Interventions, 14*(4), 209–219. doi: 10.1177/1098300712442242
- Flannery, K. B., Fenning, P., McGrath Kato, M., & McIntosh, K. (2014). Effects of school-wide positive behavioral interventions and supports and fidelity of implementation on problem behavior in high schools. *School Psychology Quarterly, 29*(2), 111–124. doi:10.1037/spq0000039
- Feuerborn, L. L., Wallace, C., & Tyre, A. D. (2013). Gaining staff support for school wide positive behavior supports: A guide for teams. *Beyond Behavior, 4*, 27–34.
- Gann, C. J., Ferro, J. B., Umbreit, J., & Liaupsin, C. J. (2014). Effects of a comprehensive function-based intervention applied across multiple education settings. *Remedial and Special Education, 35*(1), 50–60. doi:10.1177/0741932513501088
- Green, J., Liem, G. A. D., Martin, A. J., Colmar, H. W., Colmar, S., Marsh, H. W., & McInerney, D. (2012). Academic motivation, self-concept, engagement, and performance in high school: Key processes from a longitudinal perspective. *Journal of Adolescence, 35*(5), 1111–1122. doi:10.1016/j.adolescence.2012.02.016
- Goransson, K., Nilholm, C., & Karlsson, K. (2011). Inclusive education in Sweden? A critical analysis. *International Journal of Inclusive Education, 15*(5), 541–555. doi:10.1080/13603110903165141
- Kalberg, J. R., Lane, K. L., & Menzies, H. M. (2010). Using systematic screening procedures to identify students who are nonresponsive to primary prevention efforts: Integrating academic and behavioral measures. *Education and Treatment of Children, 33*(4), 561–584.
- Katz, J., & Sudgen, R. (2013). The three-block model of universal design for learning implementation in a high school. *Canadian Journal of Educational Administration and Policy, 141*, 1–28. Retrieved from <http://www.eric.ed.gov/contentdelivery/servlet/ERICServlet?accno=EJ1008728>.

- Lane, K. L., Kahlberg, J. R., Lambert, E. W., Crnobori, M., & Bruhn, A. L. (2010). A comparison of systematic screening tools for emotional and behavioral disorders. *Journal of Emotional and Behavioral Disorders, 18*(2), 100–112. doi:10.1177/1063426609341069
- Lane, K. L., Kalberg, J. R., Menzies, H., Bruhn, A., Eisner, S., & Crnobori, M. (2011). Using systematic screening data to assess risk and identify students for targeted supports: Illustrations across the K-12 continuum. *Remedial and Special Education, 32*(1), 39–54. doi:10.1177/0741932510361263
- Lane, K. L., Oakes, W. P., Menzies, H. M., Oyer, J., & Jenkins, A. (2013). Working within the context of three-tiered models of prevention: Using schoolwide data to identify high school students for targeted supports. *Journal of Applied School Psychology, 29*, 203–229. doi:10.1080/15377903.2013.778773
- Liasidou, A., & Antoniou, A. (2013). A special teacher for a special child? (Re)considering the role of the special education teacher within the context of an inclusive education reform agenda. *European of Special Needs Education, 28*(4), 494–506. doi:10.1080/08856257.2013.820484
- McMahon, S. D., Todd, N. R., Martinez, A., Coker, C., Sheu, C-F., Washburn, J., & Shah, S. (2013). Aggressive and prosocial behavior: Community violence, cognitive, and behavioral predictors among urban African-American youth. *American Journal of Community Psychology, 51*(3/4), 407–421. doi:10.1007/s10464-012-9560-4
- Mitchell, B. S., Stormont, M., & Gage, N. A. (2011). Tier two interventions implemented within the context of a tiered prevention framework. *Behavioral Disorders, 36*(4), 241–261.
- Morcom, V. E., & MacCallum, J. A. (2011). Getting personal about values: Scaffolding student participation towards an inclusive classroom community. *International Journal of Inclusive Education, 16*(12), 1323–1334. doi:10.1080/13603116.2011.572189
- Paliokosta, P., & Blandford, S. (2010). Inclusion in school: A policy, ideology or lived experience? Similar findings in diverse school cultures. *Support for Learning: British Journal of Learning Support, 25*(4), 179–186. doi:10.1111/j.1467-9604.2010.01464.x.
- Perle, J. G., Levine, A. B., Odland, A. P., Ketterer, J. L., Cannon, M. A. & Marker, C. D. (2013). The association between internalizing symptomology and risky behaviors. *Journal of Child & Adolescent Substance Abuse, 22*, 1–24. doi:10.1080/1067828X.2012.724289
- Reinke, W. M., Stormont, M., Clare, A., Latimore, T., & Herman, K. C. (2013). Differentiating tier 2 social behavioral interventions according to function of behavior. *Journal of Applied School Psychology, 29*, 148–166. doi:10.1080/15377903.2013.778771
- Reynolds, B. M., & Repetti, R. L. (2010). Teenage girls' perceptions of the functions of relationally aggressive behaviors. *Psychology in the Schools, 47*(3), 282–296. doi:10.1002/pits.20470
- Simonsen, B., Myers, D., & Brier III, D. E. (2011). Comparing a behavioral check-in/check-out (CICO) intervention to standard practice in an urban middle school setting using an experimental group design. *Journal of Positive Behavior Interventions, 13*(1), 31–48. doi:10.1177/1098300709359026
- Smith, J. A., Flowers, P., & Larkin, M. (2009). *Interpretative phenomenological analysis: Theory, method and research*. Thousand Oaks, CA: SAGE.
- Solnick, M. D., & Ardoin, S. P. (2010). A quantitative review of functional analysis procedures in public school settings. *Education and Treatment of Children, 33*(1), 153–175.

- Statistics Canada. (2013). Graduation rate Canada, provinces and territories, 2005/2006 to 2009/2010. *Statistics Canada Catalogue no. 81-595-M*. Ottawa. Version updated May 10, 2013. Ottawa. Retrieved from <http://www.statcan.gc.ca/pub/81-599-x/81-599-x2011006-eng.htm>
- Weigert, S. C. (2012). Aligning and inventing practices to achieve inclusive assessment policies: A decade of work toward optimal access for US students with disabilities 2001–2011. *International Journal of Disability, Development, and Education*, 59(1), 21–36. doi:10.1080/1034912X.2012.654935
- Wyatt, T. J. (2010). A sex-based examination of violence and aggression perceptions among adolescents: An interactive qualitative analysis. *The Qualitative Report*, 15(4), 823–851. Retrieved from <http://www.nova.edu/ssss/QR/QR15-4/wyatt.pdf>

PERSPECTIVES ON LARGE-SCALE ASSESSMENT ON PRINCE EDWARD ISLAND

Yan Yan

University of Prince Edward Island, Prince Edward Island, Canada

Abstract

Large-scale assessment (LSA) has been used worldwide as an effective tool to justify the well-being of education system in terms of accountability, gatekeeping, and instructional diagnosis. The purpose of this study was to examine public perspectives of LSAs in terms of people's knowledge and value of LSAs. A total of 515 questionnaires were completed by residents of a small Canadian province. Findings revealed that the public was informed of LSA's results but did not fully understand the purposes of LSAs. There were no significant differences when examining participants' parental status, educational attainment, and cultural affiliations with perspectives on LSAs. Findings from this study will contribute to future growth of LSA initiatives and utility of LSA data.

Keywords: Large-scale assessment, perspectives, Prince Edward Island

INTRODUCTION

Large-scale assessment has been considered to be a means of certifying the quality of an education system and to enhance accountability of regional, national and international education policymakers, administrators, and teachers (Crundwell, 2005; Chudowsky & Pellegrino, 2003; Earl, 1999; Elmore, 2004; Klinger, Maggie & D'Angiulli, 2011; Popham, 2002). In Canada, the Council of Ministers of Education, Canada (CMEC) acknowledges the need for Canadians to know the extent to which their education system is meeting the needs of students and the greater society. This governing body has implemented the Pan-Canadian Assessment Program (PCAP), which provides provincial ministers of education with a basis for examining their own provincial/territorial curriculum and other aspects of their school systems. Canadian provinces also participate in international assessment such as PISA (the Program of International Student Assessment), which initiated by Organization of Economic Co-operation and Development (OECD) since 2000.

THE PRINCE EDWARD ISLAND CONTEXT

According to DeLuca, Klinger and Miller (2008), Prince Edward Island was the last educational jurisdiction to implement large-scale assessment at a provincial level. Annual provincial assessments are conducted in Language Arts and Mathematics for all Grade 3, 6, and 9 students. In 2015, two new provincial assessments were piloted to high school students: Grade 10 Literacy Test and Grade 11 Mathematics Test. The Grade 11 Mathematics Test counts for 25% of students' final grade, and the Literacy Test is given to Grade 10 students as compulsory requirement for graduation from 2019 (Department of Education and Early Childhood Development, 2015). With respect to the national and international assessments, PE students have participated in PCAP and PISA since 2007 and 2000, respectively.

However, based on the 3-year cyclical report of PISA results, students in PE have scored at or near the bottom (CMEC, 2001, 2004, 2007, 2010, 2013). Similar to PISA results, PE student performance in PCAP needs to be improved as well. Although PE students made much progress in Mathematics in PCAP 2013, which made PE jump to the 4th out of the 11 jurisdictions, the mean score of the other two domains (reading and science) is still below the Canadian average. The score of Mathematics increased from 450 in 2007 PCAP to 492 in the most recent PCAP 2013. Similar situations in the other domains, with an increase from 460 (PCAP 2007) to 494 (PCAP 2013) in reading, and from 464 (PCAP 2007) to 491 (PCAP 2013) in science.

Given the facts of the unsatisfactory performance both in national and international large-scale assessments, this study looks into public knowledge of LSAs on PE and to what extent does the public understand LSA implications for educational accountability, children's academic success/global competency, and local economic prosperity.

METHOD

Questionnaire was distributed to residents of PE using a nonprobability purposive sampling technique combined with convenience sampling. A total of 515 questionnaires were completed (422 online and 93 paper). The questionnaire contained three major sections: Demographics (11

items), LSA knowledge (6 items), and perceptions about importance/influence of LSA (16 items). Participants' parental status, educational attainment, and cultural affiliations group were used to grouping the difference of responses within each as independent variables.

FINDINGS

General knowledge about PE student performance on LSAs

The questionnaire began with a question asking participants about how well PE students scored in Reading, Mathematics, Science, and Problem-Solving in recent LSAs. Approximately one third of the participants indicated that they were not familiar with PE student achievement in either of the four domains. However, there is a large number of participants who were knowledgeable about student performance in each of the four domains: Reading: 263 (51.6%), Mathematics: 329 (65.1%), Science: 264 (51.8%), and Problem-Solving: 247 (48.7%).

Participants were also asked to identify what they knew about PE student performance on PCAP and PISA tests compared to students from other provinces. Based on the facts that PE students always performed below the average, 378 (78.6%) participants indicated that PE students scored below the average on PCAP, even a large number of participants (289, 81.9%) noted that PE students were not doing well on PISA.

Public Perspectives on LSAs

The next question focused on the importance of provincial, national, and international LSAs in providing information about PE student performance. Participants tended to be non-committal about the importance of LSAs given the mean scores hovered around 1.8 on a 4-point scale (provincial: $M = 1.84$, $SD = 0.956$; national: $M = 1.79$, $SD = 0.912$; international: $M = 1.94$, $SD = 0.966$).

To further examine the extent of effective accountability framework as LSA indicated in PE, participants were asked to indicate whether they would move their child to a school that had better provincial test scores. Responses to this item were evenly distributed between those who move to another school and those who would not (Move to new school: 243 [49.5%]; Not move: 248 [50.5%]). It is important to note that participants who held PhDs were most likely to indicate that they would send their child to a better performing school (66.7%).

Participants' perspectives on LSAs were examined using the combined variable "total perspective on LSA" related to education system effectiveness, students' academic success/global competency, and local business prosperity. In this 6-point rating scale, participants were holding a tentative negative attitude for LSA ($M = 3.39$, $SD = 1.383$). When comparing participants' parental status, it is found that both parents ($M = 3.33$, $SD = 1.329$) and non-parents ($M = 3.46$, $SD = 1.446$) were not putting much faith in LSA. With respect to participants' educational attainment, participants who held high school diplomas were more in favor of LSA ($M = 2.74$, $SD = 1.191$), followed by the group of participants who held PhD degrees ($M = 3.30$, $SD = 1.251$), and participants who held apprenticeship or college certificates ($M = 3.32$, $SD = 1.387$). Participants from both the undergraduate ($M = 3.56$, $SD = 1.387$) and

master's group ($M = 3.49$, $SD = 1.342$) were not convinced of LSA's function of telling the wellbeing of the education system. In relation to participants' cultural affiliations, except participants from other cultural affiliation showed a natural attitude on LSAs ($M = 2.25$, $SD = 1.454$), four of the major cultural groups all held unfavorable perceptions towards LSAs, with a mean score of 3.32 ($SD = 1.330$) for Newcomers, 3.37 ($SD = 1.584$) for French community, 3.43 ($SD = 1.376$) for local community and 3.51 ($SD = 1.528$) for Aboriginal group.

A one-way ANOVA test showed that there were no significant differences at a $p < 0.05$ level in all of the three independent variables: (a) parental status [$F(1, 390) = 0.867$, $p = 0.352$]; (b) educational attainment [$F(4, 363) = 1.991$, $p = 0.095$]; and (c) cultural affiliations [$F(4, 366) = 0.570$, $p = 0.685$].

IMPLICATIONS OF THE STUDY

From the findings in this study, residents of Prince Edward Island were generally informed about student performance in LSA, but held skeptical perspectives regarding the functionality of LSAs in the education system. Negative attitudes toward relations between LSAs and children's global competency can be seen as well. Continuing on this point, little connection is made by the public about LSAs and business success and global flow of talents in this highly developing world. Information about LSAs is needed by both parents and general citizens of PE. The Department of Education, schools, and communities should take the responsibility to pass on up-to-date and valuable information about LSAs to the general public. The findings also suggest that in-depth research should be done concerning the perspectives of policymakers, LSA designers, and practitioners on newly launched provincial assessments and their key implications for students and for public as well.

REFERENCES

- Chudowsky, N. & Pellegrino, J. W. (2003). Large-scale assessments that support learning: What will it take? *Theory into Practice*, 42(1), 75–83.
- Council of Ministers of Education Canada, Human Resources Development Canada, and Statistics Canada. (2001). *Measuring up: The performance of Canada's youth in reading, mathematics and science OECD PISA Study—First Results for Canadians aged 15*. Retrieved from <http://www.cmec.ca/docs/pisa2000/CanadaReport.EN.pdf>
- Council of Ministers of Education Canada, Human Resources Development Canada, and Statistics Canada. (2004). *Measuring up: Canadian Results of the OECD PISA Study The Performance of Canada's Youth in Mathematics, Reading, Science and Problem Solving 2003 First Findings for Canadians Aged 15*. Retrieved from <http://www.cmec.ca/docs/pisa2003/pisa2003.en.pdf>
- Council of Ministers of Education Canada, Human Resources Development Canada, and Statistics Canada. (2007). *Measuring up: Canadian Results of the OECD PISA Study The Performance of Canada's Youth in Science, Reading and Mathematics 2006 First Results for Canadians Aged 15*. Retrieved from <http://www.cmec.ca/docs/pisa2006/Pisa2006.en.pdf>
- Council of Ministers of Education, Canada. (2008). *PCAP-13: Report on the assessment on 13-year-olds in reading, mathematics, and science*. Retrieved from <http://www.cmec.ca/Publications/Lists/Publications/Attachments/124/PCAP2007-Report.en.pdf>
- Council of Ministers of Education Canada, Human Resources Development Canada, and Statistics Canada. (2010). *Measuring up: Canadian Results of the OECD PISA Study. The Performance of Canada's Youth in Reading, Mathematics and Science 2009. First Results for Canadians Aged 15*. Retrieved from <http://www.cmec.ca/Publications/Lists/Publications/Attachments/254/PISA2009-can-report.pdf>
- Council of Ministers of Education, Canada. (2011). *PCAP-2010 report on the Pan-Canadian assessment of mathematics, science and reading*. Retrieved from <http://www.cmec.ca/Publications/Lists/Publications/Attachments/274/pcap2010.pdf>
- Council of Ministers of Education Canada, Human Resources Development Canada, and Statistics Canada. (2013). *Measuring up: Canadian results of the OECD PISA results. The Performance of Canada's Youth in Reading, Mathematics and Science. 2012 First Results for Canadians Aged 15*. Retrieved from http://cmec.ca/Publications/Lists/Publications/Attachments/318/PISA2012_CanadianReport_EN_Web.pdf
- Council of Ministers of Education, Canada. (2014). *PCAP 2013: Report on the Pan-Canadian assessment of science, reading, and mathematics*. Retrieved from <http://cmec.ca/Publications/Lists/Publications/Attachments/337/PCAP-2013-Public-Report-EN.pdf>
- Crundwell, R. M. (2005). Alternative strategies for large-scale student assessment in Canada: Is value-added assessment one possible answer. *Canadian Journal of Educational Administration and Policy*, 41, 1–21. Retrieved from <https://www.umanitoba.ca/publications/cjeap/articles/crundwell.html>
- DeLuca, C., Klinger, D. A. & Miller, T. (2008). The evolving culture of large-scale assessments

- in Canadian education. *Canadian Journal of Educational Administration and Policy*, 76(3), 1–34.
- Department of Education and Early Childhood Development. (2015). Retrieved from <http://www.gov.pe.ca/eecd/index.php3?number=1053591&lang=E>
- Earl, L. M. (1999). Assessment and accountability in education: Improvement or surveillance. *Education Canada*, 39(3), 4–6.
- Elmore, R. F. (2004). *School reform from the inside out: Policy, practice, and performance*. Cambridge, MA: Harvard Education Press.
- Klinger, D. A., Maggie, S. & D'Angiulli, A. (2011). School accountability and assessment: Should we put the roof up first? *The Educational Forum*, 75(2), 114–128.
- Popham, W. J. (2002, April). High-stakes test: Harmful, permanent, fixable. Paper presented at the Annual Conference of the American Research Council, New Orleans, LO.