



DALHOUSIE
UNIVERSITY

FACULTY OF
MANAGEMENT

Research in Review 2022 Edition

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DALHOUSIE
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MANAGEMENT

RESEARCH IN REVIEW

2022 Metrics

\$1.392M+

In Tri-Council
Grants Funding

\$4.314M+

In Total Grants and
Contracts Funding



QUANTITY OF
RESEARCH

173

Number of Pieces
Published in
Journals

QUALITY OF
RESEARCH

78%

of Pieces Published
in Top Quartile
(25%) of Journals



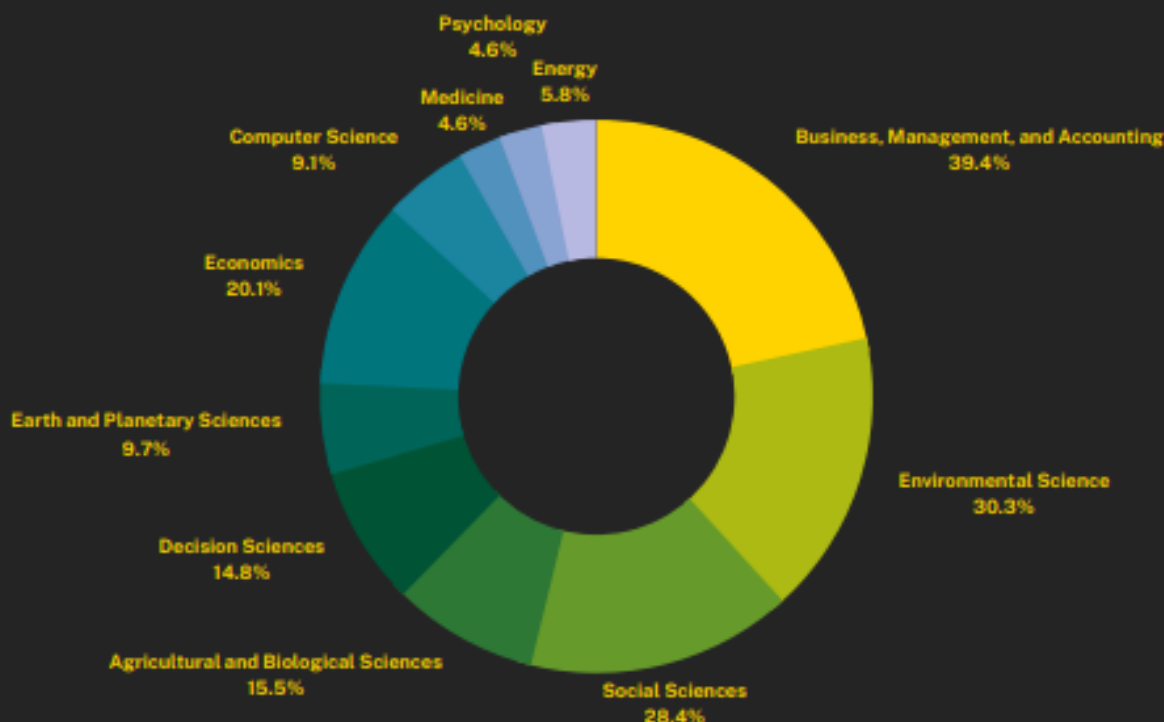
105

Research
Assistants and
Research
Support Staff
Contributors



Research Topics Breakdown

Most Frequent Topics Studied in Faculty
of Management Publications in 2022



2022 Award Winners

Dalhousie University Research Awards



**President's Excellence Award
Research Impact**

Dr. Dana Kabat-Farr



**Dalhousie Belong Research
Fellow**

Dr. Stacy Allison-Cassin

Faculty of Management Research Awards



**Research Impact
Dr. Tony Walker**



**Research Star
Dr. Léo-Paul Dana**



**Research Rising Star
Dr. Alana Westwood**

A Message from our Associate Dean Research

2022 has been a year full of successes for our Faculty of Management. We have invested a great amount of time and effort into building a new Faculty structure that will propel our cross-disciplinary issue-centered research to tackle complex multi-dimensional problems. Throughout this time, our research pulse has not skipped a beat. We published papers, discussed our research with the world, and focused on creating lasting impacts in our communities.

In this report, you will see 173 journal articles published by our researchers in the year 2022, with 78% of them in the top quartile of journals. This is just one aspect of the work we do. Our research activities also include training of new research talent at the graduate and undergraduate levels, competing for research funding, broadcasting our research to the world, and working on connections with communities and partners for whom we aim to create positive change. As you can see in the overview of metrics, we hired 105 research support staff, brought in approximately \$1.3 million in Tri-Agency research grants, and approximately \$4.3 million in research grants and contracts combined.

Importantly, our work has lasting impact on the organizations or communities on which our research focuses. We know that impact is difficult to capture, and that narratives are necessarily examples that do not describe our Faculty as a whole. Below are examples that highlight the impact and breadth of our research on society.

Dr. Dana Kabat-Farr's work was recognized with the 2022 President's Research Excellence Award (Research Impact). Her research on workplace dynamics has had a significant impact in scholarly literature and applied management practices. Among her important contributions to the field of organizational behaviour is research on the concept of selective incivility, an insidious form of discrimination that differs from harassment, because it focuses on ambiguous behaviours that are easily downplayed as oversights. Kabat-Farr has worked directly with the Canadian Department of National Defense and the US Department of the Navy, as well as human resource practices aimed at improved workplace culture and retention. Her work is published in top-tier journals.

Dr. Stacy Allison-Cassin's work on *Linked data tools and Indigenous terminologies* was recognized with the 2022 Belong Research Fellowship. This project is a component of a larger *Respectful Indigenous Terminologies Platform Project* that aims to create a permanent and sustainable online platform that will be a dynamic, multilingual source for terminology and vocabulary sets that can be applied to Indigenous Peoples, places, heritage, tradition, knowledge, and cultures. The Belong Fellowship project focuses on the assessment of existing linked data for viability of their use in the larger project.

Dr. Sherry Pictou, along with four co-Principal Investigators, was awarded a New Frontier's Research Fund in the amount of \$24 million to address issues such as food security, human-wildlife management, and the decolonization of science. Their project, titled *Ārramāt* is a co-creation that involves more than 150 Indigenous organizations, universities, and other partners across 70 ecosystems around the world that are spiritually, culturally, and economically important to Indigenous peoples. The goal is to increase the influence of Indigenous people on policies and projects that directly impact and connect their well-being and the biodiversity of their environments.

Wiesława Dominika Wranik, PhD
Professor and Associate Dean Research

Research Publications 2022

Notes on what is included in this review:

The report is based on a search in Scopus for authors employed in the Faculty of Management. Only publications with a date of 2022 are included. Some relevant items may not appear in Scopus. Additions were made to this report if identified by individual researchers by March 9, 2022. Some publications are reported in Scopus as **2022** “articles in press” and may end up being assigned to a **2023** issue. Management researchers’ names are in bold print. Publications authored by several researchers from Management appear only once under the author who appears first in the list of authors.

Adams, Michelle A.

Adesida, A. A., Carrier, A., **Adams, M.**, **Walker, T. R.**, Oakes, K., Nganou, C., Ehsan, M. F., & Zhang, X. (2022). Simultaneous degradation of persistent organic pollutants and heavy metal removal via an electrochemical filtration system: A case study on a pulp mill wastewater effluent. *Case Studies in Chemical and Environmental Engineering*, 6. <https://doi.org/10.1016/j.cscee.2022.100258>

An electrochemical filtration system via a continuous flow electrochemical reactor was designed, and its application was tested for para-nitroaniline (PNA) and industrial wastewater degradation. Optimization of operational parameters such as nature of electrode, electrolyte, and catalyst concentration was performed for electrochemical treatment of synthetic and discharged pulp mill wastewater effluent (obtained from the Boat Harbour (BH) remediation site, Nova Scotia, Canada). At the optimized conditions, 72% degradation of BH TOC (initially 105.4 mg L⁻¹) with significant reductions of heavy metals Cd (99.9%), Cr (98.8%), and metalloid (As (99.8%) concentrations, was achieved at circumneutral pH values and overall operational cost of 0.05 USD L⁻¹. Results demonstrate an effective and efficient simultaneous removal of organic and inorganic contaminants from industrial pulp mill wastewater effluent.

Liu, Z., Xu, Y., **Adams, M.**, Liu, W., **Walker, T. R.**, Domenech, T., Bleischwitz, R., & Geng, Y. (2022). Comparative analysis of the contribution of municipal waste management policies to GHG reductions in China. *Waste Management and Research*. <https://doi.org/10.1177/0734242X221135259>

Waste generation and disposal have been a global issue for decades. The total global greenhouse gas (GHG) emissions in 2019 were 49,758 MtCO₂e with waste disposal accounting for 3.2%. With rapid urbanization trends, municipal solid waste (MSW) has become a global challenge which needs to be addressed. A large fraction of MSW such as food wastes, e-waste among others still ends up with unregulated dumps or openly burned in low-income countries. As a response, China initiated the ‘zero-waste’ pilot program which has been running since 2019. To investigate the potential contribution of MSW management to GHG reductions, this study selected four ‘zero-waste’ cities in China, namely Shenzhen, Panjin, Xining and Tongling, as case studies to assess the impacts of different MSW management policies on GHG reductions from 2015 to 2019. Results demonstrated that Shenzhen city achieved progress in reducing GHGs, which decreased by more than 40% between 2015 and 2019. This study provides policy recommendations and waste management approaches and practices to optimize MSW management and reduction of GHGs.

Macneil, J. L., **Adams, M.**, & **Walker, T. R.** (2022). Evaluating the efficacy of sustainability initiatives in the Canadian port sector. *Sustainability (Switzerland)*, 14(1). <https://doi.org/10.3390/su14010373>

Maritime ports are critical nodes in the Canadian resource-based economy that can have significant environmental impacts near coastal communities and marine ecosystems. To address these

impacts, Canadian Port Authorities (CPAs) assess their environmental performance using the Green Marine Environmental Program (GMEP). Reliance on this program necessitates its evaluation as an effective initiative to address sustainability in its broader context. An analysis was performed to identify links between United Nations Sustainable Development Goals (UN SDG) targets relevant to the Canadian Port Sector and GMEP performance indicators. Results indicate that there are significant gaps in the GMEP, with only 14 of 36 relevant SDG targets directly linked to the program. Findings suggest either an expansion of the GMEP to incorporate these broader sustainability goals, or the development and inclusion of a new framework for CPAs to bridge gaps between the GMEP and SDG targets to improve sustainability in their maritime port operations.

Aghakhani, Hamed

Abbasi, S., **Aghakhani, H.**, Azizi, S., Peikanpour, M., & Mehralian, G. (2022). Corporate social responsibility and customer loyalty during the Covid-19 pandemic: evidence from pharmacy practice. *Social Responsibility Journal*. <https://doi.org/10.1108/SRJ-06-2021-0243>

Purpose: In recent years, corporate social responsibility (CSR) has taken on a more prominent role in both large and small businesses because of its significant impact on various aspects of business performance. To date, a growing body of literature has demonstrated the mechanisms whereby CSR practices affect organizational outcomes; however, there has been little research examining how CSR practices contribute to customer loyalty within the pharmacy context. As such, this study aims to explore how CSR practices influence the loyalty of pharmacy customers, particularly in relation to the mediatory effects of customer-company identification (CCI) and customer trust.

Design/methodology/approach: A survey questionnaire was developed and administered to collect the required data from the pharmacy context. The resultant data were subjected to exploratory factor analysis to identify the scale dimensions, followed by multiple regression analysis to test the hypotheses. **Findings:** Analysis of the results (n = 528) revealed that perceived CSR indirectly impacts loyalty through the mediatory effects of trust and CCI. All hypothesized effects were also confirmed via empirical testing. **Originality/value:** The findings of this research suggest that not only are CSR activities responsive to societal concerns, but they can also promote customer identification with pharmacies and strengthen customer trust, which can, in turn, lead to long-term customer loyalty.

Brooks, Kim

Okanga, O. and **Brooks, K.** (2022) Lower-Income Countries' Ongoing Quest for International Tax Justice: A Case Study of the OECD's Tax Allocation Proposal. *Canadian Business Law Journal*. 66(3), 291 – 322.

The viability of our international tax system hinges on two things: (1) safeguarding the effective flow of international activities and (2) ensuring that countries can adequately collect tax on the income derived from those activities. Each of these fundamentals relies on a defensible/fair allocation of taxing rights between countries with competing tax jurisdiction (inter-nation equity).

The recent Organisation for Economic Co-operation and Development (OECD)-led multilateral effort to transform international tax rules to ensure that countries can adequately tax multinational enterprises (MNEs) operating in the global digital economy (OECD proposal) has reignited inter-nation equity conversations. Although important to all countries, inter-nation equity is a special consideration for lower-income countries because of: (1) pre-existing perceptions that the subsisting regime is skewed against them; (2) their greater reliance on corporate taxation, including of MNEs, and (3) their limited capacity to give up taxing rights.

This article examines the OECD proposal from an inter-nation equity perspective. We contend that the deal does not adequately address the inter-nation equity concerns of lower-income countries. We, however, conclude that the path to a stable and fair outcome lies in adjusting aspects of the deal rather than invoking alternatives – e.g., withholding taxes on gross revenue – that may further distort international business. While this article focuses on the consequences of the OECD proposal for lower-income countries, higher-income countries (like Canada) are parties to the arrangements. So, Canada has a stake in the conversations and could experience negative distortions to international activities if inter-nation equity concerns are not adequately addressed.

Brooks, K. (2022). Another of COVID-19's Side Effects: Exposing the Inadequacy of our Tax System in Responding to Women's Lives. In Jennifer Robson and Lindsay Tedds, eds., *Impacts of the COVID-19 Pandemic on Women in Canada* (60-61). Royal Society of Canada. 60-61.

[[No abstract]]

Charlebois, Sylvain

Abebe, G. K., **Charlebois, S., & Music, J.** (2022). Canadian Consumers' Dining Behaviors during the COVID-19 Pandemic: Implications for Channel Decisions in the Foodservice Industry. *Sustainability* (Switzerland), 14(9). <https://doi.org/10.3390/su14094893>

The past two years have been challenging for the restaurant industry in Canada and countries worldwide. This has led many casual and fine dining restaurants to adapt their business models to overcome the immediate and long-term impacts of the COVID-19 pandemic. This paper aims to understand how COVID-19 has impacted Canadian consumers' on-and off-premise dining behaviors and how such behaviors vary among various sociodemographic groups, general knowledge of COVID-19, and telecommuting. Data were collected from a nationally representative consumer panel (n = 1091), from a survey administered online by Angus Reid. The results show that Canadian consumers increased their off-premise dining experiences during the COVID-19 pandemic, which also varied across various sociodemographic groups. There was also an increased level of telecommuting during the pandemic, of which 68% started following the pandemic. However, telecommuting was negatively correlated with off-premise dining experiences during the pandemic. Canadian consumers perceived off-premise dining during the pandemic as reasonably expensive, lesser quality, and more convenient. The findings may have important implications for casual and dining restaurants in Canada to improve channel decisions and messaging as operators prepare for a full-service post-COVID-19. They can build on the infrastructure and capability that has been established during the COVID-19 pandemic to offer sustainable services beyond the pandemic.

Charlebois, S., Hill, A., Morrison, M., Vezeau, J., **Music, J.,** & Mayhew, K. (2022). Is Buying Local Less Expensive? Debunking a Myth – Assessing the Price Competitiveness of Local Food Products in Canada. *Foods*, 11(14). <https://doi.org/10.3390/foods11142059>

It is well known that many consumers believe local foods are more expensive than comparative products coming from other markets. The aim of this study was to measure the price competitiveness of products certified by the Aliments du Québec program, a well-known program in the Canadian province of Quebec. Using machine-learning, artificial intelligence and targeted data mining, the report identifies local products and comparator products, to consider whether locally certified products are more expensive than comparative products coming from outside Quebec. Uncertified products used as comparative products come from anywhere around the world, outside of the province of Quebec. For this study, a total of more than 350,000 discrete price data points were analyzed in the Winter 2022. Local product prices were examined relative to the prices of comparator products. In total, there were 48 subcategories considered. In 70.83% of the subcategories, the local product was either as expensive (similar price) or less expensive than the

comparator product. Results challenge the popular belief that local food products are often more expensive. This study also provides limitation and future research paths.

Marangoni, A. G., Ghazani, S. M., Gammage, S., van Rosendaal, J., **Music, J., & Charlebois, S.** (2022). Higher palmitic acid and dipalmitoyloleate levels are correlated to increased firmness in commercial butter. *Food Chemistry*, 377. <https://doi.org/10.1016/j.foodchem.2021.131991>

The physical properties of butter are impacted by the fatty acid and triacylglycerol composition of the milkfat. Increased butter hardness and melting temperature results in decreased consumer satisfaction since these affect the culinary performance and spreadability. During the winter of 2021, consumers reported anecdotal evidence of an increase in butter hardness, leading to news reports blaming the increased hardness on palm oil-based supplementation of cows' feed. Commercial butter samples were collected from across Canada to test the correlation between fatty acid and triacylglycerol composition, and hardness. We determined that palmitic acid ($r = 0.74$) and dipalmitoyloleate ($r = 0.72$) were significantly and positively correlated to commercial butter hardness ($P < 0.01$). However, due to restricted access to existing historical data on the chemical composition of milk fat and hardness of butter, it was not possible to compare the firmness of butter in 2021 with butter produced in the past.

Music, J., & Charlebois, S. (2022). Consumer perceptions about food retail and services during the first wave of COVID-19 in Canada: An exploratory study. *Cogent Social Sciences*, 8(1). <https://doi.org/10.1080/23311886.2022.2072556>

During the first quarter of 2020, the global COVID-19 pandemic disrupted the lives of Canadians, changing the way they worked, studied, and shopped. In addition to restrictions on freedom of movement and gathering, there was confusion spread on social media platforms about points and rates of transmission. Inconsistent messaging from public health authorities and government representatives eroded public trust, despite the initially low rate of infection. This research was carried out through four cross-country surveys to explore the experience and perceptions about food retail and food service during the COVID-19 pandemic in Canada. Results suggest confusion and fear towards food provisioning. As well, telecommuting and adoption of online shopping tools drove consumer behaviour in food retail during the first wave of the pandemic. Our findings demonstrate a need for innovation in the food retailing and service sector.

Music, J., Charlebois, S., Marangoni, A. G., Ghazani, S. M., Burgess, J., Proulx, A., Somogyi, S., & Patelli, Y. (2022). Data deficits and transparency: What led to Canada's 'buttergate.' *Trends in Food Science and Technology*, 123, 334–342. <https://doi.org/10.1016/j.tifs.2022.02.005>

Background: During the fall of 2020, consumers began to question the consistency of Canadian butter. Many consumers expressed their dissatisfaction on social media the following winter. For months, Canadian dairy industry stakeholders debated the on-farm practices and processing of dairy products on social media. International media amplified the concerns of consumers. Though a long-held practice, the use of palm oil derivatives as feed supplements for dairy herds was questioned due to its environmental track-record. Scope and approach: We collected 84 samples of butter from across Canada to test melting points per palmitic acid and oleic acid content. The fatty acid composition of butter fats was determined using gas chromatography (GC) analysis. However, a full investigation into the quality of end products would be virtually impossible due to the nature of the dairy supply chain in Canada. Key findings and conclusions: We found that higher palmitic acid and oleic acid content increased the melting points of butter. However, the culture and structure of the Canadian dairy industry is such that it's impossible to compare against benchmarks due to large data deficiencies related to industry standards.

Music, J., Charlebois, S., Toole, V., & Large, C. (2022). Telecommuting and food E-commerce: Socially sustainable practices during the COVID-19 pandemic in Canada. *Transportation Research Interdisciplinary Perspectives*, 13. <https://doi.org/10.1016/j.trip.2021.100513>

Telecommuting has become a dominant professional experience for many Canadian business and workers due to the COVID-19 pandemic. Telecommuting has several benefits that are separate from COVID-19. Two prevalent changes have been in regard to telecommuting and online food buying habits, both of which impact social wellbeing as a dimension of social sustainability. We discuss two exploratory surveys on the perception of telecommuting and food e-commerce. We found that while telecommuting has the potential to increase social wellbeing and the social sustainability of both urban and rural Canadian communities through a variety of mechanisms, food e-commerce does not offer similar returns. Instead, the prevalence of food e-commerce merely adds convenience to the lives of those who already have adequate food access while maintaining the status quo, or even worsening access for disadvantaged Canadians.

Music, J., Large, C., Charlebois, S., & Mayhew, K. (2022). Gardening from the ground up: a review of grassroots governance and management of domestic gardening in Canada. *Local Environment*, 27(8), 1046–1058. <https://doi.org/10.1080/13549839.2022.2100880>

The Canadian urban agriculture movement marks a change in urban land-use policies that includes a greater diversity of gardeners as views on sustainable agriculture promotes local food movements. Benefits of urban agriculture are well documented in the social science, environmental and health literature. Much of the literature on urban food-gardens in Canada focuses on community gardens and school gardens and gardening programmes, while there has been little attempt to gather and synthesise this research with a focus on the governance and management of grassroots urban agri-food organisations. We have undertaken through a systematic scoping review to reveal the extent of the current body of knowledge surrounding urban grassroots agri-food organisations in Canada, as well as governance and management paradigms and challenges. Of the Canadian studies, 15 were qualitative case studies (surveys, observations, etc.), 11 were exploration/analysis papers (analysis of primary research collected elsewhere), one was a literature review and 1 was a quantitative analysis. Significant challenges in grassroots food-gardening are explored. We found that for greater success of urban agriculture, municipal policymakers need to intentionally and radically shift policy to plan for and integrate urban agriculture networks into the urban environment without taking over the networks themselves. We also find that there is a lack of broad research into the influence of gender dynamics on the organisation and management of urban agriculture or community gardens.

Music, J., Mullins, L., Charlebois, S., Large, C., & Mayhew, K. (2022). Seeds and the city: a review of municipal home food gardening programs in Canada in response to the COVID-19 pandemic. *Humanities and Social Sciences Communications*, 9(1). <https://doi.org/10.1057/s41599-022-01301-6>

In the wake of the COVID-19 pandemic in Canada, home food gardening articles have saturated popular media outlets. Home food gardening is more popular than ever, and community gardens and community greenhouses are at capacity with long waiting lists for plots. Several local governments across the country are also participating in the food gardening craze. This study compares 19 municipal urban home food gardening programs that ran in 2020. These municipalities provided program participants with free gardening supplies and instructions on how to grow food at home. This study reveals a complicated relationship among municipalities, food gardening programs and household and community food security. The study also determines that the social and emotional challenges brought about by the COVID-19 pandemic are somewhat alleviated through gardening. Ultimately, municipalities are limited in their policy capacities to adequately move the needle on food insecurity in Canada.

Osmond, A. T. Y., **Charlebois, S.**, & Colombo, S. M. (2022). Exploratory analysis on Canadian consumer perceptions, habits, and opinions on salmon consumption and production in Canada. *Aquaculture International*. <https://doi.org/10.1007/s10499-022-00972-x>

Given the growth and change in Canadian salmon aquaculture in the last several years, there is a need to understand consumer habits on salmon consumption and knowledge and perception of salmon production in Canada. The objective of this study is to better understand current salmon consumption trends and consumer views and opinions on salmon farming production in Canada. Canadian participants completed a survey separated into two different sections: (1) consumption habits and preferences and (2) knowledge and perception of production methods. Quantitative descriptive data was collected through a cross-sectional consumer survey in Canada, which included 30 questions. Total sample size was 10,009 respondents (48% female, 52% male). Participants were randomly selected from the representative of the Caddle omni access panel. A total of 79% of Canadians do eat salmon, of which 10% eat salmon weekly. Baby Boomers (born in 1946–1964) have the highest consumption rate at 84%, while Millennials (born in 1981–1996) have the lowest, at 72%. A total of 49% of Canadians prefer wild salmon but 42% have no preference. A total of 62% want to eat a product produced in a natural habitat. Of those surveyed, 37% believe wild salmon presents a lower risk of contamination, and 29% believe wild salmon to be more nutritious. A total of 21% of Canadians prefer to eat farmed salmon that has been raised on a land-based farm; however, a total of 39% prefer an ocean farm as a method of production. While 38% of Canadians prefer Atlantic salmon, 33% prefer Pacific salmon (Sockeye, Pink, Chinook, and Chum species) and 29% do not have a preference. Only 26% of Canadians were aware that organic salmon existed. A total of 55% of Canadians would be more inclined to buy farmed salmon if it were fed a diet that is environmentally sustainable and nutritious. A total of 54% believe that aquaculture is a sustainable way to harvest salmon in Canada. Canadians appear to support the sustainable nature of ocean farm production. Nonetheless, our results suggest that 50% of respondents appear to misunderstand what land-based and ocean farm means. Overall, Canadians enjoy salmon, but results indicate consumers are misinformed about method of production and species type indicating a need for improved information accessibility to the public on salmon production and consumption.

Chen, Jing (Jenny)

Chen, W., **Chen, J.**, & Ma, Y. (2022). Competition vs cooperation: renewable energy investment under cap-and-trade mechanisms. *Financial Innovation*, 8(1). <https://doi.org/10.1186/s40854-022-00380-3>

This paper explores the incentives of investment in renewable energy of two utility firms who compete or cooperate under either a cap-and-trade grandfathering mechanism (GM) or benchmarking mechanism (BM). We find that utility firms will invest in renewable energy more under BM than under GM, in both competitive and cooperative markets, and they will invest more in a competitive market than in a cooperative market, under either GM or BM. Furthermore, utility firms will produce more electricity and generate more total carbon emissions under BM than under GM. The profits of two firms, however, are higher in cooperative market than in competitive market. The government will benefit from implementing a BM to encourage utility firms to invest in renewable energy in a competing market.

Li, D., **Chen, J.**, Chen, B., & Liao, Y. (2022). Manufacturer's contract choice and retailer's returns management strategy. *Transportation Research Part E: Logistics and Transportation Review*, 165. <https://doi.org/10.1016/j.tre.2022.102862>

Managing customer returns is a supply chain issue; manufacturers typically manage them through buyback contracts, while retailers can attempt to recover a product's salvage value, or sell it as an

open-box item. This paper investigates returns management strategies by developing a game theoretical model for a supply chain with a manufacturer (Stackelberg leader) and a retailer (the follower) facing customer returns. The manufacturer chooses either a buyback or a wholesale-price contract. Under a wholesale-price contract, the retailer either salvages or resells returned products. We identify the optimal returns management strategy. We show that each of the three strategies may achieve Pareto improvement for both supply chain members, and for the customers and society. The retailer's choice to resell or not depends on its inspection cost, or the system efficiency of the supply chain in reselling a returned product relative to that in selling a new product. The manufacturer's choice of contract depends on whether it can salvage a returned product more efficiently than the retailer, and on the retailer's unit inspection cost of the returned product. We capture a few identifiable quantities and thresholds that help the manufacturer and the retailer to simplify decision making.

Liu, Z., **Chen, J.**, Diallo, C., & Venkatadri, U. (2022). Optimal extended warranty pricing and retailing strategies in a closed-loop supply chain. *International Journal of Production Research*. <https://doi.org/10.1080/00207543.2022.2083997>

Extended warranties are widely adopted and accepted in the marketplace by manufacturers and retailers as it helps to enhance the customers' post-sale satisfaction. In closed-loop supply chains, the extended warranty not only generates profit for the manufacturer, but also provides warranty returns of the new products for remanufacturing. In this paper, a two-period model is developed and optimal pricing strategies for the extended warranties are derived. We compare the optimal pricing and retailing strategies of the extended warranties for remanufactured and new products offered by the manufacturer with and without the retailer's own extended warranty while considering the competition between the manufacturer and the retailer for the extended warranty of new products. We find that the introduction of the retailer's extended warranty does not always hurt the manufacturer's profit. Numerical analyses also show that there exists an optimal extended warranty length for the manufacturer that maximises its profit. Moreover, we show that the retailer cannot extract more profit by increasing the length of its own extended warranty.

Sun, L., Chen, B., **Chen, J.**, & Yang, H. (2022). When should a retailer with competing manufacturers reveal product fit information? *International Journal of Production Research*. <https://doi.org/10.1080/00207543.2022.2044536>

We investigate whether and when a retailer who sells two quality differentiated products supplied by two manufacturers should reveal product fit information to help consumers find a product that better fits their needs. We show that the retailer's optimal information strategy depends on the consumer's unit misfit cost and production efficiencies of both manufacturers. The retailer should reveal product fit information when the ratio of the efficiencies of the two manufacturers is sufficiently low, or the consumer's unit misfit cost is sufficiently high. The retailer is less likely to benefit from revealing product fit information when the consumer's unit misfit cost is either low or very high. Two mechanisms, margin-enhancing (driving the efficient manufacturer to reduce the wholesale price) and market-targeting (setting higher retail prices for both products), that the retailer can benefit from revealing product fit information are discussed, and the associated conditions are identified. Our findings suggest that the inefficient manufacturer is always better off when the retailer reveals fit information, but the efficient manufacturer may suffer. A win-win-win for all supply chain members can be achieved under certain conditions.

Wan, X., **Chen, J.**, & Chen, B. (2022). The manufacturer's encroachment strategy in the presence of the retailer's in-store service. *International Journal of Production Research*. <https://doi.org/10.1080/00207543.2022.2147238>

We examine the manufacturer's encroachment strategy in the supply chain in the presence of the retailer's in-store service. The manufacturer has the option of encroachment with a direct channel, and the retailer has the option of providing in-store service. If the retailer decides to offer service, it sets the service level. We show that in the presence of in-store service, the manufacturer is less likely to encroach on the retail market than in the absence of in-store service. The retailer always prefers to provide in-store service. If the manufacturer decides to encroach, it will strategically use its direct channel with no sales as a threat to the retailer, independent of whether or not the retailer provides in-store service. The retailer can be better off with manufacturer encroachment, but it can be worse off when consumer sensitivity to in-store service is very low. We show that the retailer can strategically employ in-store service to deter the manufacturer's encroachment when the consumer sensitivity to in-store service is sufficiently high.

Wang, F., **Chen, J.**, Yang, H., & **Yu, B.** (2022). Supplier selection with information disclosure in the presence of uninformed consumers. *International Journal of Production Economics*, 243. <https://doi.org/10.1016/j.ijpe.2021.108341>

This paper investigates the impact of consumer's uncertainty as to quality preference on the retailer's supplier selection decision, and on supply chain pricing decisions. When the retailer adopts a single-supplier structure, both informed (knowing quality preference) and uninformed (not knowing quality preference) consumers are in the market, and the retailer has two different market-targeting strategies. An uninformed consumer can be informed by the presentation of two quality-differentiated products supplied by two suppliers, when the retailer selects dual-supplier structure and sells both products. We show that the dual-supplier structure is not always a dominant strategy when there exists a portion of uninformed consumers in the market. The retailer will choose the dual-supplier structure if the proportion of informed consumers is either low or very high, while it will choose a single high-quality supplier to target both consumer groups if the proportion of informed consumers is moderately high. Moreover, the retailer is more likely to adopt the low-price strategy targeting both informed and uninformed consumers when the proportion of the informed consumer in the market is lower; otherwise, it adopts a high-price strategy targeting informed consumers only. The impacts of the consumer's quality preference uncertainty on the retailer's supplier selection and on suppliers under the retailer's optimal supplier selection strategy are also examined. We also include numerical studies to illustrate main results.

Wang, L., **Chen, J.**, & Lu, Y. (2022). Manufacturer's channel and logistics strategy in a supply chain. *International Journal of Production Economics*, 246. <https://doi.org/10.1016/j.ijpe.2022.108415>

We examine a manufacturer's channel selection and logistics strategies in a supply chain where the manufacturer can sell either through an e-tailer only (single channel) or through the e-tailer and also directly to the consumer (dual channel). With a dual-channel structure, the manufacturer needs to decide how to deliver products sold in its own direct channel: an independent logistics system or the e-tailer's logistics system. We identify the manufacturer's optimal channel selection and logistics strategies. The results show that the manufacturer's channel decision depends on the logistics gap between channels and the self-demand sensitivity. When the logistics gap is relatively large and the self-demand sensitivity is small, introducing a direct channel reduces the manufacturer's profit. When both the logistics gap and self-demand sensitivity are large, the manufacturer should choose the dual-channel structure and use the e-tailer's logistics. When the logistics gap is small, the manufacturer should choose the dual-channel structure and use its own logistics system. We also examine the implications of promised delivery time (PDT) in the direct channel and show that PDT makes the direct channel more attractive and the manufacturer is more likely to adopt the dual-channel strategy.

Yan, N., Liu, Y., & **Chen, J.** (2022). Competitors or frenemies? Strategic investment between competing channels. *Transportation Research Part E: Logistics and Transportation Review*, 164. <https://doi.org/10.1016/j.tre.2022.102784>

It is increasingly common for an online retailer to invest in a competitor offline retailer, or vice versa. In order to identify the conditions under which this type of cross-investment in a competitor is attractive, we develop a duopoly model with an e-tailer and a brick-and-mortar (BM) retailer, and ask when, or whether, one member of the duopoly should invest in the other. The impact of the investment decision on the duopoly's leadership structure, prices, demands, and profits are investigated. Our study shows that the investor chooses to invest in the investee when the investee's value is medium; the investment can weaken the price competition between the two channels, and lead to a win-win outcome. When there is no cross-channel investment, the member of the duopoly that is more efficient in selling the product should take the leadership role by setting the selling price first. When one member of the duopoly does decide to invest in the other, however, the leadership decision depends strongly on the relative initial values of the two retailers. Finally, we show that when the initial value of the investee as estimated by the investor is sufficiently low, and the customer's degree of acceptance of the e-tailer's channel is sufficiently high, the investor prefers to be an investment holder; otherwise, the investor prefers to receive a dividend.

Zhang, Q., **Chen, J.**, & Lin, J. (2022a). Interaction between innovation choice and market-entry timing in a competitive fashion supply chain. *International Journal of Production Research*. <https://doi.org/10.1080/00207543.2022.2044532>

We consider a duopoly in which a premium firm (Firm 1) competes with a regular firm (Firm 2). They launch a new fashion product, adopting one of two types of innovation, qualitative or non-qualitative, which offer different levels of market acceptance and uncertainty. We consider two groups of fashion consumers, snobs and conformists (defined by preference for exclusivity or conformity). We first examine the case in which the premium firm commits to entering the market first and chooses its type of innovation, and then the regular firm decides on market-entry timing and innovation type. The price game and the strategy interaction between the two firms are examined. We show that consumers' exclusivity and conformity positively impact the optimal decisions of the two firms when the initial market share of snobs is large. When the market-share loss due to late entry is sufficiently high, Firm 1 may prefer a non-qualitative innovation under certain identified conditions; otherwise, it always prefers a qualitative innovation. Firm 2 always benefits from Firm 1's choice of qualitative rather than non-qualitative innovation. We further discuss the strategy interaction when the premium firm commits to entering the market late.

Zhang, Q., **Chen, J.**, & Lin, J. (2022b). Market targeting with social influences and risk aversion in a co-branding alliance. *European Journal of Operational Research*, 297(1), 301–318. <https://doi.org/10.1016/j.ejor.2021.05.022>

We consider a fast-fashion brand that cooperates with a luxury brand, jointly launching a co-branded product. The impacts of the co-branding on the two brands' original product lines are uncertain, and each brand can be either risk averse or risk neutral. Consumers, driven by exclusivity or conformity, are classified as either snobs or conformists. The equilibrium retail price, quality investment, and investment support are derived. The optimal market-targeting strategy for the fast-fashion brand as marketer of the co-branded product, is identified. We show that the fast-fashion brand is willing to give up either the conformist or the snob market under certain conditions, even when it has sales in both markets. In addition, given a particular market-targeting strategy, the fast-fashion brand benefits from its own risk aversion if the cost of risk is low, but the luxury brand is always worse off; the luxury brand may benefit from the fast-fashion brand's risk aversion, however, if the market-targeting strategy is changed. Both brands are worse off when the luxury brand is risk averse.

Zhao, H., **Chen, J.**, & Ai, X. (2022). Contract strategy in the presence of chain to chain competition. *International Journal of Production Research*, 60(6), 1913–1931.
<https://doi.org/10.1080/00207543.2021.1876945>

This paper studies contract strategy for two competing supply chains selling a substitutable product under demand uncertainty. Each supply chain consists of a risk neutral manufacturer and a risk averse retailer. As Stackelberg leader in each supply chain, each manufacturer needs to decide which type of contract to provide to its retailer, either a revenue sharing contract or a wholesale price contract. We identify the conditions under which each type of contract should be offered in a competitive market, and which type of contract is preferred by manufacturers only, or by both manufacturers and retailers. We show that wholesale price contracts may be a better choice than revenue sharing contracts for the manufacturers, to mitigate fierce chain-to-chain competition. Wholesale price contracts are preferred by the manufacturers over revenue sharing contracts when the price competition is moderate and demand variation is significant. A revenue sharing contract is the dominant choice for both the manufacturers and the retailers when the price competition is weak and demand uncertainty is low, as long as a revenue sharing ratio is negotiated in a proper range, a win-win outcome for all supply chain members.

Chowdhury, Shamsud D.

Chowdhury, S. D., & Sheppard, J. P. (2022). Corporate wrongdoing and board leadership structure: An analysis of the WestJet spying scandal. *Canadian Journal of Administrative Sciences*, 39(4), 381–395.
<https://doi.org/10.1002/cjas.1678>

This study focuses on corporate espionage undertaken by WestJet Airlines, Canada's second largest air carrier. Employing a case study, we examine how board leadership-endorsed internet snooping affected WestJet's board structure and performance. We also paired the case study with an event study methodology to enhance the case narrative and illustrate market responses to continuing revelations of WestJet's espionage over time. We find that investors initially discounted WestJet's value then over time reacted more to market changes and positive scandal-related outcomes. WestJet withstood the adverse effects of wrongdoing and regained investor confidence and profitability via substantive and symbolic changes to their board leadership structure. The study's theoretical and practical implications are also given.

Cloutier, Anika

Cloutier, A., & Barling, J. (2022). Witnessing interparental violence and leader role occupancy: the roles of insecure attachment and gender. *Equality, Diversity and Inclusion*, 41(6), 866–888.
<https://doi.org/10.1108/EDI-10-2021-0279>

Purpose: Given the role leaders play in organizational effectiveness, there is growing interest in understanding the antecedents of leader emergence. The authors consider parental influence by examining how witnessing interparental violence during adolescence indirectly affects adult leader role occupancy. Drawing on the work-home resources (W-HR) model, the authors hypothesize that witnessing interparental violence serves as a distal, chronic contextual demand that hinders leader role occupancy through its effects on constructive personal resources, operationalized as insecure attachment. Based on role congruity theory, the authors also predict that the relationship between attachment style and leader role occupancy will differ for women and men.

Design/methodology/approach: To test the hypotheses, the authors used data from the National Comorbidity Survey Replication (NCS-R) (n = 1,665 full-time employees). **Findings:** After controlling for age, education, childhood socioeconomic status and experienced violence, results showed that the negative indirect effects of witnessing interparental violence on leader role occupancy through

avoidant attachment was significant for females only, while the negative effects of anxious attachment hindered leader role occupancy across sexes. Originality/value: Results identify novel distal (interparental violence) and proximal (attachment style) barriers to leader role occupancy, showing empirical support for the life-span approach to leadership and the persistent effects of home demands on work.

Comber, Scott

Bungay, V., Guta, A., Slemon, A., Varcoe, C., & **Comber, S.** (2022). The Ethics of Financial Incentivization for Health Research Participation Among Sex Workers in a Canadian Context. *Qualitative Health Research*, 32(6), 942–955. <https://doi.org/10.1177/10497323221089877>

Research incentivization with sex workers is common, yet limited guidance exists for ethical incentives practice. We undertook a critical qualitative inquiry into how researchers (n = 17), community services staff (n = 17), and sex workers participating in research (n = 53) perceive incentives in a Canadian context. We employed an interpretive thematic approach informed by critical perspectives of relational autonomy for analysis. Four themes illustrate how (un)ethical use of incentives is situated in transactional micro-economies among groups experiencing severe marginalization: i) transactional research economy, ii) incentive type: assumptions and effects, iii) incentive amount: too much too little?, and iv) resistance, trauma, and research-related harm. Paternalistic assumptions about capacities of sex workers to act in their own best interests conflicted with participants' rights and abilities for self-determination; with researchers maintaining ultimate decision-making authority. Power differentials create conditions of harm. Safe, equitable approaches concerning research incentive use must redress relations of power that perpetuate oppression.

Gautam M, **Comber S.** (2022). We have a great idea, now what? Using the Canadian Healthcare Lean Canvas for implementing innovation. *Canadian Journal of Physician Leadership*, 8(2):67-70. <https://doi.org/10.37964/cr24751>

The Canadian Healthcare Lean Canvas has successfully provided a manageable and actionable innovation framework with which to capture the key aspects of proposed health care innovation projects as used by participants in a physician leadership development program to address large-scale complex issues in health care.

Conrad, Colin

Conrad, C. D., Aziz, J. R., Henneberry, J. M., & Newman, A. J. (2022). Do emotions influence safe browsing? Toward an electroencephalography marker of affective responses to cybersecurity notifications. *Frontiers in Neuroscience*, 16. <https://doi.org/10.3389/fnins.2022.922960>

Cybersecurity notifications play an important role in encouraging users to use computers safely. Emotional reactions to such notifications are known to positively influence users' adherence to these notifications, though it is challenging for researchers to identify and quantify users' emotional reactions. In this study, we explored electroencephalography (EEG) signals that were elicited by the presentation of various emotionally charged image stimuli provided by the International Affective Picture System (IAPS) and compared signals to those elicited by images of cybersecurity notifications and other computer-related stimuli. Participants provided behavioral assessments of valence and arousal elicited by the images which were used to cross-reference the results. We found that EEG amplitudes corresponding to the late positive potential (LPP) were elevated in reaction to images of cybersecurity notifications as well as IAPS images known to elicit strong positive and negative valence, when compared to neutral valence or other computer-related stimuli.

These findings suggest that the LPP may account for emotional deliberation about cybersecurity notifications, which could be a useful measure when conducting future studies into the role such emotional reactions play in encouraging safe computer behavior.

Conrad, C., Deng, Q., Caron, I., Shkurska, O., Skerrett, P., & Sundararajan, B. (2022). How student perceptions about online learning difficulty influenced their satisfaction during Canada's Covid-19 response. *British Journal of Educational Technology*, 53(3), 534–557. <https://doi.org/10.1111/bjet.13206>

The COVID-19 pandemic has posed a significant challenge to higher education and forced academic institutions across the globe to abruptly shift to remote teaching. Because of the emergent transition, higher education institutions continuously face difficulties in creating satisfactory online learning experiences that adhere to the new norms. This study investigates the transition to online learning during Covid-19 to identify factors that influenced students' satisfaction with the online learning environment. Adopting a mixed-method design, we find that students' experience with online learning can be negatively affected by information overload, and perceived technical skill requirements, and describe qualitative evidence that suggest a lack of social interactions, class format, and ambiguous communication also affected perceived learning. This study suggests that to digitalize higher education successfully, institutions need to redesign students' learning experience systematically and re-evaluate traditional pedagogical approaches in the online context. Practitioner notes What is already known about this topic University transitions to online learning during the Covid-19 pandemic were undertaken by faculty and students who had little online learning experience. The transition to online learning was often described as having a negative influence on students' learning experience and mental health. Varieties of cognitive load are known predictors of effective online learning experiences and satisfaction. What this paper adds Information overload and perceptions of technical abilities are demonstrated to predict students' difficulty and satisfaction with online learning. Students express negative attitudes towards factors that influence information overload, technical factors, and asynchronous course formats. Communication quantity was not found to be a significant factor in predicting either perceived difficulty or negative attitudes. Implications for practice and/or policy We identify ways that educators in higher education can improve their online offerings and implementations during future disruptions. We offer insights into student experience concerning online learning environments during an abrupt transition. We identify design factors that contribute to effective online delivery, educators in higher education can improve students' learning experiences during difficult periods and abrupt transitions to online learning.

Conrad, C., Klesel, M., Mayhew, K., O'Neil, K., Oschinsky, F. M., & Usai, F. (2022). Is Our Ability to Detect Errors an Indicator of Mind Wandering? An Experiment Proposal. *Lecture Notes in Information Systems and Organisation*, 58, 105–112. https://doi.org/10.1007/978-3-031-13064-9_11

Mind wandering could have a variety of impacts on information systems phenomena, not least long monotonous tasks. Unfortunately, mind wandering states are difficult to measure objectively. In this paper, we describe work-in-progress to address this problem in a novel way. We describe two studies that will observe participants' ability to detect errors in a task as a correlate of mind wandering. Demonstrating the technique using a lecture paradigm, the studies employ previously investigated methods of measuring mind wandering as a baseline for the new technique. If successful, we will demonstrate a new method for measuring mind wandering that can be applicable to a broad range of information systems and psychological studies.

Conrad, C., Moylan, R., & Diaz, G. O. (2022). University life has gone digital: influences of institutional mobile social network use during the COVID-19 emergency. *Library Hi Tech*. <https://doi.org/10.1108/LHT-12-2021-0458>

Purpose: Many universities implemented institutional social networking apps as an alternative to in-person social experiences during the COVID-19 pandemic. Therefore, this study aims to explore previously identified factors that influenced intentions to form collective actions, also known as we-intentions, on such social networking apps and their influence on student satisfaction with the app artifact. **Design/methodology/approach:** Students from across a large university were invited to participate in a survey. Responses from 915 students who reported using the app were analyzed using a maximum likelihood covariance-based structural equation model. Analysis was conducted using the R programming language's psych, lavaan, and semTools packages. **Findings:** The authors found that we-intentions are positively associated with recent app use and with student satisfaction with the app. Group norms were found to significantly influence the formation of we-intentions, while social identity is positively associated with both we-intentions and satisfaction. **Originality/value:** The paper provides evidence that past research generalizes to the context of university mobile social networks and identifies a relationship between we-intentions and satisfaction in this context. It also provides practical insight into factors that influence we-intentions, and subsequently students' online education experience, in the context of a university's institutional mobile social network.

Conrad, C., & Newman, A. J. (2022). Towards Mind Wandering Adaptive Online Learning and Virtual Work Experiences. *Lecture Notes in Information Systems and Organisation*, 58, 261–267. https://doi.org/10.1007/978-3-031-13064-9_27

NeuroIS researchers have become increasingly interested in the design of new types of information systems that leverage neurophysiological data. In this paper we describe the results of machine learning analysis which validates a method for the passive detection of mind wandering. Following the presentation of the results, we describe ways that this technique could be applied to create a neuroadaptive online learning and virtual meeting tool which may improve users' retention of information by providing auditory feedback.

Cray, Heather

Gaudon, J. M., McTavish, M. J., Hamberg, J., **Cray, H. A.**, & Murphy, S. D. (2022). Noise attenuation varies by interactions of land cover and season in an urban/peri-urban landscape. *Urban Ecosystems*, 25(3), 811–818. <https://doi.org/10.1007/s11252-021-01194-4>

Anthropogenic noise is increasing worldwide because of growing human populations, transportation, and resource extraction. This excessive noise negatively impacts humans and wildlife. To mitigate noise pollution, the use of vegetation in urban planning is becoming increasingly common. However, noise attenuation can be influenced by poorly understood differences in land cover and seasonality that exist across complex urban and peri-urban environments. We compared the noise attenuation capacity of sites typifying dominant land covers in southern Ontario, Canada (forest, tallgrass prairie, and agriculture) across three seasons (summer, fall, and winter). We found that total noise attenuation was affected by a complex interaction of both site and season across low (250 Hz), mid (500 Hz), and high (1000 Hz) frequency sound. Seasonal changes in vegetation density varied between sites and seemed to play only a partial role in total noise attenuation. While forest, trees, and shrubs continue to be effective for managing noise pollution, our results suggest that other types of land cover can also be useful (e.g., tallgrass prairie). With growing interest in the potential noise attenuating capabilities of vegetation, we recommend further consideration of the seasonal variation in attenuation that can occur across the diverse land covers of urban and peri-urban environments.

Cunningham, Peggy

Cunningham, P. & Drumwright, M. (2022). Opportunities and Challenges of Researching Persistent Unethical Behavior in the Workplace Using a Grounded Theory Approach to In-depth Interviews. Sage Research Methods Cases: Business & Management.

[No abstract]

Cunningham, P. & Drumwright, M. (2022). Incivility in the Workplace: A Call for an Ethical Analysis Approach. Encyclopedia of Business and Professional Ethics, D.C. Poff & A.C. Michalos (eds). Springer Nature: Switzerland. doi.org/10.1007/978-3-319-23514-1_783

[No abstract]

Cunningham, P. (2022). Corporate social responsibility in small-and medium-sized fast-growth private firms: How is CSR conceived, enacted, and communicated. In The Routledge Handbook of Corporate Social Responsibility Communication. <https://doi.org/10.4324/9781003184911-22>

[[No abstract]]

Drumwright, M. E., & **Cunningham, P. H.** (2022). Unethical Newsroom Behavior: Paradoxes and a Perfect Storm. Journalism Practice, 16(5), 963–983. <https://doi.org/10.1080/17512786.2020.1825114>

Unethical behavior in newsrooms has come to public attention, and despite the glare of publicity, it persists. This research examines the question of why newsrooms provide a context conducive to persistent unethical workplace behaviors. We conducted 25 in-depth interviews with reporters, editors, anchors, producers, and news executives. Sexual harassment has been in the public eye, but our informants also described other unethical workplace behaviors such as bullying, discrimination, and incivility. Behavioral ethics emerged as a theoretical lens to help interpret our data. Five explanatory themes arose: 1) conceiving of work solely as creating journalistic content; 2) toxic rituals, rites of passage, and norms; 3) high power differentials and acquiescent behavior; 4) ineffective organizational mechanisms; and 5) a disruptive industry context. Networks of complicity enabled the bad behavior, and together with the themes, created a perfect storm that permitted unethical behavior to persist. Two paradoxes resulted: 1) the ethics paradox in which journalists had high ethical sensitivity in reporting but were blind to unethical behavior within newsrooms and 2) the power paradox in which journalists experienced role conflict caused by the need for initiative, courage, independence, and resistance to intimidation in reporting versus the dependence, obedience, and acquiescence required within newsrooms.

Dana, Léo-Paul

Agarwal, S., Ramadani, V., **Dana, L.-P.**, Agrawal, V., & Dixit, J. K. (2022). Assessment of the significance of factors affecting the growth of women entrepreneurs: study based on experience categorization. Journal of Entrepreneurship in Emerging Economies, 14(1), 111–136. <https://doi.org/10.1108/JEEE-08-2020-0313>

Purpose: The ascent of women enterprising community (WEC) in a couple of decades draws the attention of various government and non-government bodies. Literature has mentioned various studies that focus on the factors affecting the success or failure of women entrepreneurs (WEs), but understanding of the ranking of the factors depending on the experiences of different WEs is needed. This study aims to identify the significant factors essential for the growth of WEC. **Design/methodology/approach:** This study examines the factors through interview of 33 WEs having different entrepreneurial experiences (less than 1 year, more than 1 year but less than 10 years and more than 10 years of experiences) from different regions of Uttar Pradesh, India, and with the help of analytical hierarchical process, ranks the factors affecting the sustainable growth

of WEs. Findings: Through analysis, significant factors have been identified such as determination, education, entrepreneurial resilience, personal satisfaction and provide employment, and these factors have been analysed according to the different experiences of WEs. An investigation of ranking these factors of WEC, especially in the emerging nations, can assist policymakers in designing projects that improve the mindfulness associated with women enterprise and define the compelling methodologies. Practical implications: The growth of the WEC is significantly affected by gender orientation ways of thinking as driven by entrepreneurship models. Originality/value: This study gives a direction to policymakers by emphasizing on significant factors of various stages of enterprise development for the encouragement of WEs in the emerging economies.

Alserhan, B. A., Zeqiri, J., Ramadani, V., & **Dana, L.-P.** (2022a). An Introduction to Strategic Islamic Marketing. In *Contributions to Management Science*. https://doi.org/10.1007/978-3-030-98160-0_1

This chapter discuss the Islamic marketing concept and its four distinct stages that form a logical sequence before Islamic marketing could attain the thought leadership position it is capable of. These stages are Islamic Marketing 1.0 (IM 1.0), awareness; Islamic Marketing 2.0 (IM 2.0), Islamization of existing theory; Islamic Marketing 3.0 (IM 3.0), theory making; and Islamic Marketing 4.0 (IM 4.0), thought leadership.

Alserhan, B. A., Zeqiri, J., Ramadani, V., & **Dana, L.-P.** (2022b). Halal Industry: Threats and Barriers. In *Contributions to Management Science*. https://doi.org/10.1007/978-3-030-98160-0_2

This chapter provides basic information on halal industry's threats and barriers. There are key issues that the halal industry needs to address before it can take its rightful place, such as the halal industry is dominated by non-Muslims; the halal industry in Muslim countries remains mostly fragmented, with numerous insignificant players; halal certification chaos; there is a clear lack of halal-qualified Muslim workforce to keep up with the rising demand for halal services and skills; and the different sectors and businesses in the halal industry seem to have embraced a "silo" mentality where each of these sectors or businesses seems to be developing independently.

Braune, E., & **Dana, L.-P.** (2022). Digital entrepreneurship: Some features of new social interactions. *Canadian Journal of Administrative Sciences*, 39(3), 237–243. <https://doi.org/10.1002/cjas.1653>

Digital technologies permit a massive reduction of transaction costs. As a result, traditional social interactions that take place in the entrepreneurial ecosystem are disrupted and a new landscape emerges. Digital platforms are the organizational form that benefit most from reductions in transaction costs; they take a prominent advantage from their ability to scout worldwide emergent knowledge, as well their ability to match extraordinarily heterogeneous demands with dedicated supply. Digital platforms shape social interactions and the ways value is created in the global economy. As such, they are becoming the cornerstone of the digital entrepreneurship ecosystem. This special issue highlights some of the key features of the renewal of social interactions in the digital entrepreneurship ecosystem and opens up avenues for future research.

Broccardo, L., Truant, E., & **Dana, L.-P.** (2022). The sustainability orientation in the wine industry: An analysis based on age as a driver. *Corporate Social Responsibility and Environmental Management*. <https://doi.org/10.1002/csr.2420>

Few studies probe small and medium enterprises (SMEs) in the context of sustainability. Thus, this study examines the sustainability orientation in SMEs and its impact on financial performance, considering the 'ageing effect'. It employs a sample of Italian SMEs operating in the wine sector, using a survey questionnaire to collect qualitative and quantitative data for analysis. Accordingly, although sustainability remains typically unembedded within such SMEs, when it is embedded, a positive correlation with performance is evident. Furthermore, age is a relevant variable that can explain a different sustainability orientation and its impact on financial performance. This research

contributes insight into sustainability orientation in SMEs, extending the sustainability, age, and SME performance literature. Managerial implications suggest the need to better emphasise social issues and invest more in skilled human resources and training programmes.

Caputo, A., Pellegrini, M. M., Dabić, M., & **Dana, L.-P.** (2022). Introduction to The International Dimension of Entrepreneurial Decision-Making: Cultures, Contexts, and Behaviours. In *Contributions to Management Science*. https://doi.org/10.1007/978-3-030-85950-3_1

This chapter introduces the content of the book, presenting the key insights from the contributed chapters. The book comprises 11 diverse and insightful contributions from nine different countries.

Cater, J. J., Ramadani, V., & **Dana, L.-P.** (2022). Family business and work spirituality and religion. In *Workplace Spirituality: Making a Difference*.

[[No abstract]]

Chhabra, M., **Dana, L.-P.**, Ramadani, V., & Agarwal, M. (2022). A retrospective overview of Journal of Enterprising Communities: People and Places in the Global Economy from 2007 to 2021 using bibliometric analysis. *Journal of Enterprising Communities*, 16(6), 1033–1059. <https://doi.org/10.1108/JEC-06-2021-0091>

Purpose: This paper aims to examine the pattern of publications, using a bibliometric analysis of the Journal of Enterprising Communities: People and Places in the Global Economy (JEC) for the period between 2007 and 2021. **Design/methodology/approach:** The study uses relevant bibliometric metrics and procedures. The analysis covers mainly the number of articles published in JEC, most influential years in terms of the number of publications and citations, top productive countries, most prolific authors, most influential institutions, funding institutions, co-authorship trends, keywords co-occurrence, and vital themes of JEC articles between 2007 and 2021. **Findings:** The journal's influential impact in terms of citations has increased over time, with 83.62% of the published works receiving at least one citation. Léo-Paul Dana has been recognised as the most prolific author by virtue of his contribution of articles in JEC, and the maximum contribution to JEC comes from the USA, followed by Canada and the UK. University of Canterbury, New Zealand and La Trobe University, Australia were the leading contributing institutions. The study identified “indigenous entrepreneurs”, “gender”, “social entrepreneurship”, “education” and “innovation” as contemporary keywords in the study of enterprising communities. These issues present a clear opportunity for research-related topics for the JEC. **Originality/value:** To the best of the authors' knowledge, this is the first comprehensive piece in the journal's history that provides a general overview of the journal's major trends and researchers.

Dana, L.-P. (2022). Preface. In *Contributions to Management Science*.

[[No abstract]]

Dana, L.-P., Nziku, D. M., Palalić, R., & Ramadani, V. (2022). Women entrepreneurs in North Africa: Historical Frameworks, Ecosystems and New Perspectives for the Region. In *Women Entrepreneurs in North Africa: Historical Frameworks, Ecosystems and New Perspectives for the Region*. <https://doi.org/10.1142/9789811236617>

This book provides scientific evidence, both theoretically and empirically, on the understudied field of women entrepreneurs across North Africa. It provides insights on the domain of women entrepreneurship, undertaking critical assessment of overall historical frameworks, ecosystems and future perspectives of the region. Women entrepreneurship is among the most important and unexploited sources of economic growth in the developing world. Yet, despite much progress in socioeconomic aspects such as health, life expectancy and education, the gender economic gap

remains unchanged. More needs to be done to understand the underlying forces and factors in the region to challenge the current status quo.

Dana, L.-P., Ramadani, V., Palalic, R., & Salamzadeh, A. (2022). Preface. In *Contributions to Management Science*.

[[No abstract]]

Dana, L.-P., Salamzadeh, A., Mortazavi, S., & Hadizadeh, M. (2022). Investigating the Impact of International Markets and New Digital Technologies on Business Innovation in Emerging Markets. *Sustainability (Switzerland)*, 14(2). <https://doi.org/10.3390/su14020983>

International markets and digital technologies are considered among the factors affecting business innovation. The emergence and deployment of digital technologies in emerging markets increase the innovation potential in businesses. Companies with an entrepreneurial orientation also strengthen their innovation capabilities. The present study aimed to investigate the impact of international markets and new digital technologies on business innovation in emerging markets, and to estimate the mediating effect of entrepreneurial orientation on this relationship. The present research was applied research in terms of aim and descriptive survey in terms of data collection method and quantitative in terms of the type of collected data. A standard questionnaire was to collect data. The study's statistical population consisted of all companies providing business services in Tehran, Iran. To analyse the data, the structural equation modelling method with partial least squares method and Smart PLS-3 Software was used. The results revealed that international markets and digital technologies are positively associated with innovation. They also revealed that when a company's entrepreneurial orientation increases, the digital technologies and international markets will be more involved in mutual relationships.

Dana, L.-P., Salamzadeh, A., Mortazavi, S., Hadizadeh, M., & Zolfaghari, M. (2022). Strategic Futures Studies and Entrepreneurial Resiliency: A Focus on Digital Technology Trends and Emerging Markets | Estudios estratégicos futuros y resiliencia empresarial: Análisis de tendencias en tecnología digital y mercados emergentes. *Tec Empresarial*, 16(1), 87–100. <https://doi.org/10.18845/te.v16i1.6038>

Digital transformation and its unpredictable nature make future studies to be of paramount importance for dealing with a crisis and identifying market trends and opportunities existing in new markets. Moreover, future studies guarantee enterprises to develop accurate models toward their perspective and distinguish enterprises from their competitors. This study presents a strategic future study in entrepreneurial resiliency considering digital development trends in emerging markets. To do so, the researchers used the Delphi technique. The findings reveal that fifteen driving forces which panel experts suggested are effective in this regard. Artificial intelligence, data mining, environmental scanning, business circumstances prediction, and property research were of paramount importance among these forces. The paper concludes with some directions for future research and suggestions for policymakers and practitioners.

Dana, L.-P., & Sharma, N. (2022). Management of human resources in SMEs and start-ups: Introduction. In *Managing Human Resources in SMEs and Start-ups: International Challenges and Solutions*. https://doi.org/10.1142/9789811239212_0001

Management of human resources is a critical decision that organizations especially the small enterprises make after a lot of deliberation and careful analysis. The book addresses several issues and challenges that SMEs and start-ups face during the management of their workforce. This introductory chapter aims to set the premise of this discussion and shares the basic understanding of these issues and challenges, letting the readers know what they can expect from the rest of the book. The chapter also illustrates through real world images the involvement of human resources in the small business and the impact it has on their overall outcomes.

Dana, L.-P., Sharma, N., & Singh, V. K. (2022). Managing Human Resources in SMEs And Start-ups: International Challenges and Solutions. In *Managing Human Resources in SMEs and Start-ups: International Challenges and Solutions*. <https://doi.org/10.1142/12341>

Human resources are the most important and costliest assets in businesses of any nature and size, no matter where they are based in the world. Talent management is a key managerial function in MNCs and other organisations with a global presence, but its importance in small businesses and start-ups cannot be overlooked. At its most basic level, managing people in small businesses encompasses compliance with the applicable labour laws, hiring, and creating a channel for dealing with employee issues. The price of not having the right employees in a small business can be extremely high. Workers who are inefficient or in the wrong role can have critical consequences on the sustainability of a small business. While most entrepreneurs focus on marketing, finance, operations, and customers in their initial stages, this means that they at times fail to establish and address their HR function and the associated challenges that, if overcome, may help the organisation to meet all of its targets. This book aims to highlight these HR challenges and shed new light on how to answer them.

Etemad, H., Gurau, C., & **Dana, L.-P.** (2022). International entrepreneurship research agendas evolving: A longitudinal study using the Delphi method. *Journal of International Entrepreneurship*, 20(1), 29–51. <https://doi.org/10.1007/s10843-021-00292-w>

The heterogeneity of research topics in international entrepreneurship (IE) makes the identification of a convergent research agenda difficult. Addressing this, we replicate a 2008 Delphi study, analyzing research directions considered relevant by recognized experts of IE, and also comparing the two sets of data, in an attempt to map the evolution of IE research. This is a first attempt to collect and analyze IE longitudinal data using the Delphi method. Findings provide a basis for developing a future research agenda, facilitating collaboration among researchers. This study can facilitate the understanding and enacting of IE activities for academics, entrepreneurs, and policy-makers.

Fidanoski, F., Simeonovski, K., Kaftandzieva, T., Ranga, M., **Dana, L.-P.**, Davidovic, M., Ziolo, M., & Sergi, B. S. (2022). The triple helix in developed countries: when knowledge meets innovation? *Heliyon*, 8(8). <https://doi.org/10.1016/j.heliyon.2022.e10168>

This paper deals with innovation viewed through the triple helix model as a milestone in the contemporary society of knowledge-based economies. Our goal is to empirically investigate the (in)efficient utilisation of academia, industry and government as three helices in order to boost innovations. Therefore, we construct a sample of 30 developed OECD countries with data covering the period from 2006 to 2018 and set up an input-oriented BCC data envelopment analysis that employs variables with non-negative average values over the entire period to calculate their efficiency scores. Our estimates from the radial models show that countries could reduce their inputs by a mean value of 11.9 per cent and keep their level of innovations in the triple helix model and by a mean of 5.8 per cent on average in the extended quintuple helix model. We find higher total inefficiencies in the non-radial models, which amount to 25.3 per cent on average in the triple helix model and 21.8 per cent on average in the quintuple helix model. The breakdown of the inefficiency score for different inputs reveals that countries have the largest potential for reducing CO2 emissions and the least room to reduce the Education Index and Civil Society Participation.

Guha, S., Mandal, A., Dhar, P., Poddar, S., & **Dana, L.-P.** (2022). Stone Carving in India and the Need for Process Innovation. In *Contributions to Management Science*. https://doi.org/10.1007/978-3-030-82303-0_9

In the developing and third world countries, in particular, a sustainable livelihood approach to poverty reduction has become a prime concern worldwide, where livelihood depends largely on the

outcomes of conventional farming. On the other hand, the handicraft sector traditionally plays an influential role in improving people's livelihood conditions. It is a growing challenge to conserve and preserve the knowledge and skills of traditional crafts. Handicraft by local craftsmanship and materials are special manifestations of a specific culture or society. However, growing globalization leads to more commoditization of goods, and artisans find their products competitive worldwide. It is also necessary to secure a sustainable livelihood for the artisans who work in this traditional craft. This chapter will explore the traditional art form of stone carving, which is widely practiced among a group of people of the Susunia region of Bankura district of West Bengal, India. This research will look at the limitations and weaknesses associated with stone-carving operations and also aims to investigate the numerous livelihood results obtained from stone-carving activities by stoneworkers through entrepreneurial activities. Entrepreneurship is known as an antidote to poverty and unemployment. This research aims to promote and explore the influence of entrepreneurship on the sustainability of artisans.

Jafari-Sadeghi, V., Sukumar, A., **Dana, L.-P.**, & Anderson, R. B. (2022). Guest editorial: International entrepreneurship from behavioural perspectives. *International Journal of Entrepreneurial Behaviour and Research*, 28(3), 569–576. <https://doi.org/10.1108/IJEBr-04-2022-998>

[No abstract]

Kalu, E. U., & **Dana, L.-P.** (2022). Socio-cultural web and environmentally-driven community entrepreneurship: a portrayal of Abia Ohafia community in South-Eastern Nigeria. *Journal of Enterprising Communities*, 16(4), 540–561. <https://doi.org/10.1108/JEC-12-2020-0211>

Purpose: This study is aimed at providing a deduction on the necessity of social and cultural capital for entrepreneurial outcomes on a community-wide scale. **Design/methodology/approach:** There is a drift from an individualised form of entrepreneurship to community-based entrepreneurship with a grand focus on social needs of current and emergent nature. This study is both archival and exploratory and has pictured culture and communality as drivers that are needful for enterprising communities. **Findings:** This paper finds communality, social network, social capital and trust as push-factors for community-based entrepreneurship and development drives. **Originality/value:** This study is an original exposé on the Abia Ohafia community's Model of community-based entrepreneurship which thrives on strong institutions (like the Age Grade System) and age-long practices that have built trust and stability. This local community through its networks, culture and communalities creates relationships, rational innovation, consensual leadership and participatory followership under which resources, opportunities and solutions are deliberately advanced for meeting social and community purposes.

Kumar, S., Sahoo, S., Lim, W. M., & **Dana, L.-P.** (2022). Religion as a social shaping force in entrepreneurship and business: Insights from a technology-empowered systematic literature review. *Technological Forecasting and Social Change*, 175. <https://doi.org/10.1016/j.techfore.2021.121393>

Religion is widely regarded as a social force that shapes entrepreneurship and business (EB) activity, behavior, and practice. However, a holistic review of religion and EB literature remains elusive, which could impede the field's advancement when competing arguments are introduced and pure replications are pursued. Therefore, this study conducts a technology-empowered systematic literature review using a combination of fit-for-purpose bibliometric software to examine the state of the literature on religion and EB research. The review reveals that existing research in the field have mainly focused on how religions such as Buddhism, Christianity, Hinduism, and Islam influence consumerism, corporate social responsibility, sustainability, leadership orientation, organizational culture, financial and social ethics, and socioeconomic development, and that future research can enrich the field by investigating religion in tandem with business

education, marketing, economics and public policy, and cognitive characteristics and behavioral inclinations, as well as the reversed influence of EB on religious orientation.

Nziku, D. M., Ramadani, V., & **Dana, L.-P.** (2022). Women Entrepreneurs in Tanzania. In *Contributions to Management Science*. https://doi.org/10.1007/978-3-030-98966-8_11

This chapter provides insights into women entrepreneurship in the United Republic of Tanzania (URT). Authors provide an introduction and background of women entrepreneurship in Tanzania with the historical overview of sociopolitical and economic development as well as the general entrepreneurial ecosystem. Government initiatives and policies for promoting women entrepreneurship within the country have been discussed together with some highlights of Tanzanian women entrepreneurship towards the future.

Palalic, R., Hisrich, R. D., **Dana, L. P.**, & Ramadani, V. (2022). Sustainability of global and international business operations during the adversity and hardship. *Heritage and Sustainable Development*, 4(1), 18–26. <https://doi.org/10.37868/hsd.v4i1.78>

The COVID-19 pandemic has altered the way business is conducted. The widespread closure of commercial organizations presents opportunities to reset the way business activities are conducted. Regardless of the organization's size or its status as a domestic or international firm, due diligence is required to find solutions that will allow firms to sustain their business activities in uncertain times. This study addresses this issue and attempts to identify issues that require urgent attention so that organizations can be effective and efficient in their global operations. In this context, the study proposes three imperatives for global/international businesses to sustain their operations in the long term. These imperatives include having a strong reserve fund, access to a local mutual fund, and networking to form alliances in host countries. Other implications are discussed, and we identify areas for future research.

Pergelova, A., Angulo-Ruiz, F., & **Dana, L.-P.** (2022). The Entrepreneurial Quest for Emancipation: Trade-Offs, Practices, and Outcomes in an Indigenous Context. *Journal of Business Ethics*, 180(2), 481–503. <https://doi.org/10.1007/s10551-021-04894-1>

This paper builds on theoretical developments that view entrepreneurship as emancipation, i.e., entrepreneurial activities as generators of change and pursuit of freedom from perceived constraints. Using a representative data set of 1095 SMEs owned by Indigenous entrepreneurs in Canada, the authors investigate how pursuit of this freedom affects (i) the way entrepreneurs enact several aspects of their ventures and (ii) the performance outcomes achieved. Findings reveal how the initial motivations of entrepreneurs (seeking change for the social collective of which they are a part versus seeking autonomy for themselves) lead to distinct business practices, which in turn impact differentially entrepreneurial outcomes.

Rahman, M. M., **Dana, L.-P.**, Moral, I. H., Anjum, N., & Rahaman, M. S. (2022). Challenges of rural women entrepreneurs in Bangladesh to survive their family entrepreneurship: a narrative inquiry through storytelling. *Journal of Family Business Management*. <https://doi.org/10.1108/JFBM-04-2022-0054>

Purpose: Family entrepreneurship benefits women because of their economic, family, and social needs. But, as rural women, it is not much easy for them to maintain their family entrepreneurship successfully. Thus, this paper aims to explore the main challenges faced by rural women entrepreneurs in Bangladesh to survive their family entrepreneurship.

Design/methodology/approach: This study is qualitative in nature, based on narrative inquiry. The purposive sampling technique was used as a part of a non-probability sampling method to collect the data from rural women entrepreneurs from three districts (Khulna, Shatkira, and Sylhet) in Bangladesh engaged in family entrepreneurship. No new information was found after collecting the data from seven (07) respondents; thus, they were chosen as the final sample size. **Findings:** The

findings show that rural women entrepreneurs faced primarily social and cultural, financial, and skill-related challenges, though they face other challenges to survive their family entrepreneurship. The attitude and perception of society toward women and their roles are at the root of social and cultural barriers. Researchers also found that financial challenges have a colossal impact on rural women and the other problem. Practical implications: Although entrepreneurial activities are essential for socio-economic development in these developing countries, this research adds to the existing information by highlighting the main challenges that rural women face when they want to be business owners and entrepreneurs. Originality/value: Research on rural women entrepreneurship in Bangladesh is limited and new. This study can provide an overview of the challenges faced by the rural women entrepreneurs and provide them with a blueprint for the development of women entrepreneurs in developing countries.

Ratten, V., & **Dana, L.-P.** (2022). Sustainable Entrepreneurship, Family Farms and the Dairy Industry. In *Research Anthology on Strategies for Maintaining Successful Family Firms* (Vol. 2). <https://doi.org/10.4018/978-1-6684-3550-2.ch042>

There has been increasing recognition that for regional competitiveness in rural areas there needs to be a focus on sustainable farming initiatives especially for family farms that are competing with global conglomerates. Family farms, whilst declining in number, are the purpose of this paper studying the rural entrepreneurship in family farms as they are at the heart of rural communities and the overall agricultural industry and comprise a high percentage of total farms. This paper takes a case study approach using in-depth semi structured interviews to delve into the types of entrepreneurial strategies that are distinctive of family farms in terms of their sustainability approach to farming. Dairy farms in the West Victorian area of Australia are studied and the findings suggest that family farms can increase their regional competitiveness and international standing by focusing on their collaborative, social and sustainable entrepreneurial strategies.

Salamzadeh, A., & **Dana, L. P.** (2022). A systematic literature review of crisis management in and by small and medium-sized enterprises. In *Small and Medium Sized Enterprises and the COVID-19 Response: Global Perspectives on Entrepreneurial Crisis Management*. <https://doi.org/10.4337/9781802205770.00013>

Small and medium-sized enterprises are considered to be the main players of economies, and they can facilitate economic development. When compared to larger firms, these entities are also more fragile and sensitive in the face of any type of crisis. Their approaches toward managing crises have not been explored deeply and studied sufficiently. Therefore, this chapter reviews the extant literature on crisis management and SMEs and also concentrates on how crisis management practices are conducted by SMEs, portraying where we have been and where we might go. Then, the major streams of crisis management, typologies, approaches and processes are identified and presented. In so doing, a combination of descriptive, bibliometric, and content analyses is used to review the literature systematically. A total of 158 publications, published between 1998 and August 2020, are analysed accordingly using an analytical framework. Finally, the chapter concludes with some directions for future research and a series of concluding remarks for the management of crises by SMEs.

Salamzadeh, A., **Dana, L.-P.**, Mortazavi, S., & Hadizadeh, M. (2022). Exploring the Entrepreneurial Challenges of Disabled Entrepreneurs in a Developing Country. In *Contributions to Management Science*. https://doi.org/10.1007/978-3-030-97079-6_5

Creating the proper conditions to change the attitude and mentality of those with disabilities towards creativity, innovation, and entrepreneurship in Iran is classified as one of the general and specific issues, accompanied by concerns over solving the challenges in entrepreneurship and startups shaped by people with disabilities (PWDs). The study tried to examine the opportunities

available in Iran to identify the entrepreneurial challenges of the disabled and provide strategies to create and develop startups launched by the disabled. The study used the grand theory method to determine the entrepreneurial challenges of the disabled and five relevant basic factors (institutional, environmental, developmental, social, and personal factors) as causal conditions. Furthermore, effective intervention and context for identifying strategies and presenting outcomes have been conducted according to the library studies and analysing and reviewing interviews with six active and top disabled entrepreneurs in the field of startups and businesses. Among the findings were attention to the role of government and reforming social attitudes to increase the economic activities of the disabled by prescribing four indigenous propositions to reduce the challenges in the process of creating startups shaped by the disabled, firstly to their presence in the economic cycle and social influence, and secondly, for developing entrepreneurs with disabilities and creating self-employment, sharing knowledge and experiences among them.

Theodoraki, C., **Dana, L.-P.**, & Caputo, A. (2022). Building sustainable entrepreneurial ecosystems: A holistic approach. *Journal of Business Research*, 140, 346–360. <https://doi.org/10.1016/j.jbusres.2021.11.005>

Growing interest in entrepreneurial ecosystems (EEs) over the last 15 years has led to an increase in publications in academic journals. This new concept has become a central topic in entrepreneurship research; however, it remains atheoretical, static and broad. While several bibliometric and systematic literature reviews have developed a research agenda for EEs, a holistic framework that integrates sustainability factors with theories, methods and approaches is still needed. This study provides such a framework through a bibliometric analysis and systematic literature review of high-quality contributions in this field. The results of a citation and network analysis using the co-occurrence, co-authorship, bibliographic coupling, and co-citation techniques, highlight the state of the art of research and distinguish three thematic clusters in the EE literature. A holistic framework is then developed by integrating sustainability factors into the EE literature, and several emerging directions for future research are highlighted.

Toska, A., Ramadani, V., **Dana, L.-P.**, Rexhepi, G., & Zeqiri, J. (2022). Family business successors' motivation and innovation capabilities: the case of Kosovo. *Journal of Family Business Management*, 12(4), 1152–1166. <https://doi.org/10.1108/JFBM-11-2021-0136>

Purpose: This study aims to investigate the second-generation successors' motives to join family businesses and their ability to generate innovation within them. **Design/methodology/approach:** A qualitative methodology is used in this study. Data were collected through structured interview with the second-generation representatives, where the data obtained helped us to come to the results and answer the research questions of the study. A total of 15 interviews were conducted. **Findings:** The findings of this study show that the second generation is motivated to continue the family business, cases show that successors since childhood have been oriented towards building an entrepreneurial mindset and also after entering the family business have generated innovation. **Originality/value:** The study will bring theoretical implications to the family business literature, providing scientific evidence for the second generation of family businesses, from an emerging country such as Kosovo. As Kosovo is an emerging country, the study will contribute to the literature, suggesting other studies by emerging countries in this way to see the similarities and differences.

Troise, C., **Dana, L. P.**, Tani, M., & **Lee, K. Y.** (2022). Social media and entrepreneurship: exploring the impact of social media use of start-ups on their entrepreneurial orientation and opportunities. *Journal of Small Business and Enterprise Development*, 29(1), 47–73. <https://doi.org/10.1108/JSBED-01-2021-0041>

Purpose: The aim of this paper is to investigate how social media use (SMU) affects the entrepreneurial orientation (EO) and entrepreneurial opportunities (EOP) of start-ups.

Design/methodology/approach: The hypothesis testing and analysis were conducted using the partial least squares approach to structural equation modeling (PLS-SEM). **Findings:** The research shows that SMU has a strong positive impact on EOP, while it has no impact on start-ups' EO. Interestingly, the impact of SMU on EOP is stronger than the impact of EO on EOP. **Originality/value:** The findings add new knowledge to the emerging research stream that focuses on SMU in the context of entrepreneurship and provides useful insights for both scholars and practitioners. In particular, the evidence suggests implications for stakeholders with regard to their firms' entrepreneurial activities. This research offers several possible avenues for future research.

Wahee, S., **Dana, L.-P.**, Gera, N., & Vesperi, W. (2022). Antecedents of entrepreneurial intention with specific reference to cyber entrepreneurship in Delhi/NCR. *International Journal of Entrepreneurship and Innovation Management*, 26(1–2), 110–131. <https://doi.org/10.1504/IJEIM.2022.120896>

The study aims to examine key drivers of entrepreneurial intention, with specific reference to cyber entrepreneurship. Understanding the key drivers and intention of cyber entrepreneurs has become a central issue in academic and public policy debate. Research is descriptive and causal in nature. A total of 817 students in the final year of management studies program, from management institutes in Delhi/NCR, were surveyed through a self-designed questionnaire. We have employed SPSS and AMOS to analyse the data using exploratory factor analysis and confirmed factor analysis. results of this research signify that all the independent variables such as attitude to entrepreneurship (ATE), entrepreneurship education (EE), perceived structural support (PSS), role of IT (RIT), cyber entrepreneurship intention, cyber entrepreneurial motivation factors and personality traits (PT), emerged as key factors of cyber entrepreneurship. This study offers theoretical exploration and practical research on the determinants of students' cybernetic entrepreneurship intention.

Deval, Hélène

Pfeiffer, B. E., **Deval, H.**, & Kardes, F. R. (2022). Financial scarcity and caloric intake: It is not always about motivation. *Journal of Consumer Behaviour*, 21(6), 1454–1463. <https://doi.org/10.1002/cb.2097>

Although prior research has established a cognitive association between perceived financial resources and increased caloric intake, the underlying process is still largely unknown. To date, the psychological influence of financial cues on eating behavior has primarily been explained in terms of goal activation. Perceived scarcity of financial resources is thought to result in a motivational drive to acquire food. In this research, we provide empirical support for this account while exploring how other types of cognitive associations involving semantic constructs (like traits) can also impact eating behavior. Traits are distinguishing qualities or characteristics that are associated with an individual or a group. They are commonly activated spontaneously during social interactions, leading to an associative behavior. Since semantic constructs are not motivational, they influence behavior in the absence of motivation. In this paper, we contribute to the existing literature in several ways. First, we conceptually replicate prior research, providing further support for the behavioral effects of a cognitive association between financial resources and caloric intake. Second, we provide empirical evidence that financial cues influence eating behavior both motivationally and non-motivationally. Lastly, we find that trait constructs and goal constructs can be activated independently and have differential effects on eating behavior.

El Hazzouri, Mohammed

Rabiah-Mohammed, F., Hamilton, L. K., Oudshoorn, A., Bakhash, M., Tarraf, R., Arnout, E., Brown, C., Benbow, S., Elnihum, S., **El Hazzouri, M.**, Esses, V. M., & Theriault, L. (2022). Syrian Refugees' Experiences of Housing Stability during the COVID-19 Pandemic: Barriers to Integration and Just Solutions. *Studies in Social Justice*, 16(1), 9–32. <https://doi.org/10.26522/SSJ.V16I1.2669>

Research has shown high levels of housing precarity among government-assisted refugees (GARs) connected to difficult housing markets, limited social -benefits, and other social and structural barriers to positive settlement (Lumley-Sapanski, 2021). The COVID-19 pandemic has likely exacerbated this precarity. Research to date demonstrates the negative consequences of the COVID-19 pandemic for refugees and low-income households, including both health-related issues and economic challenges, that may exacerbate their ability to obtain affordable, suitable housing (Jones & Grigsby-Toussaint, 2020; Shields & Alrob, 2020). In this context, we examined government-assisted Syrian refugees' experiences during the pandemic, asking: how the COVID-19 pandemic has impacted Syrian refugees' experiences of housing stability. To examine this issue, we interviewed 38 families in Calgary, London, and Fredericton. Using a qualitative descriptive methodology for analysis and interpretation (Thorne et al., 1997), we found the liminality of settling as a GAR has been compounded by isolation, further economic loss, and new anxieties during -the pandemic. Ultimately, for many participants, the pandemic has thwarted their housing stability goals and decreased their likelihood of improving their housing conditions. Based on our findings, we discuss potential policy and practice relevant solutions to the challenges faced by refugees in Canada during the pandemic and likely beyond.

Engau, Alexander

Ehrgott, M., **Engau, A.**, & Wiecek, M. M. (2022). Theory, computation, and practice of multiobjective optimisation. *Annals of Operations Research*, 319(2), 1477–1478. <https://doi.org/10.1007/s10479-022-05051-1>

[No abstract]

Fooladi, Iraj

Fooladi, I. J., & Hebb, G. (2022). Drivers of differences in performance of ESG-focused funds relative to their underlying benchmarks. *Global Finance Journal*. <https://doi.org/10.1016/j.gfj.2022.100745>

Several studies have examined whether environmental, social, and governance (ESG) focused funds outperform their benchmarks. While these studies vary in their methods and scope, their findings indicate that, at a minimum, these funds do not underperform their benchmarks on a risk-adjusted basis. This study is designed to further contribute to this body of research by analyzing the performance of the Jantzi Social Index (JSI) relative to its underlying benchmark, the TSX 60, and to gain insight into the possible factors that drive their performance differences. Our findings indicate that JSI's performance differential is driven (primarily) by the higher weight that JSI attaches to companies with higher net ESG scores and not (necessarily) by its superior asset-selection ability. As the regulators globally move toward making ESG disclosure mandatory, these findings become particularly relevant.

Gonzalez, Paola

Aguilar-Loja, O., Dioses-Ojeda, L., Armas-Aguirre, J., & **Gonzalez, P. A.** (2022). A decision tree-based classifier to provide nutritional plans recommendations. *Iberian Conference on Information Systems and Technologies, CISTI*, 2022-June. <https://doi.org/10.23919/CISTI54924.2022.9820144>

The use of machine learning algorithms in the field of nutritional health is a topic that has been developed in recent years for the early diagnosis of diseases or the recommendation of better nutritional habits. People with poor diets are more prone to chronic diseases and, in the long term, this can lead to death. This study proposes a model for the recommendation of nutritional plans

using the decision tree technique considering the patient data, in complement with the BMI (Body Mass Index) and BMR (Basal Metabolic Rate) to evaluate and recommend the best nutritional plan for the patient. The algorithm used in the model was trained with a dataset of meal plan data assigned by specialists which were obtained from the Peruvian food composition table, and the data from the diets that were assigned and collected from the nutrition area of the Hospital Marino Molina Scippa in Lima, Peru. Preliminary results of the experiment with the proposed algorithm show an accuracy of 78.95% allowing to provide accurate recommendations from a considerable amount of historical data. In a matter of seconds, these results were obtained using Scikit learn library. Finally, the accuracy of the algorithm has been proven, generating the necessary knowledge so that it can be used to create appropriate nutritional plans for patients and to improve the process of creating plans for the nutritionist.

Ho, Shuna

Ho, S. S. H., Oh, C. H., & Shapiro, D. (2022). Can Corporate Social Responsibility Lead to Social License? A Sentiment and Emotion Analysis. *Journal of Management Studies*. <https://doi.org/10.1111/joms.12863>

The term social license (SL) refers to the acceptance or approval by a community of a company's presence. It is generally assumed in the literature that effective corporate social responsibility (CSR) actions will lead to an SL. In this study we examine the CSR-SL relationship at the local community level and establish boundary conditions on the effectiveness of local CSR in creating an SL. Using consent-based micro-social contract theory, we theorize that commitment to local CSR improves the level to which a local community grants an SL to a multinational corporation (MNC), but the impact is moderated by the global legitimacy of the parent company, the nature of institutions in the host country, and the degree of **polarization** within the focal community. Based on 3696 articles regarding 43 global mining MNCs operating in 523 local communities between 2008 and 2020, we use natural language processing and sentiment analysis to evaluate the degree to which a local community grants an SL. Our empirical evidence indicates that local CSR does positively influence the granting of an SL, but the effect is reduced when there is strong rule of law or high community polarization and increased when the focal firm has strong global legitimacy.

Kabat-Farr, Dana

Walsh, B. M., & **Kabat-Farr, D.** (2022). Investigating the Implications of Changes in Supervisor and Organizational Support. *Journal of Occupational Health Psychology*, 27(6), 585–598. <https://doi.org/10.1037/ocp0000339>

Workers tend to experience many benefits when they work for supportive supervisors and organizations. But what happens when workers experience changes in perceived support, more or less support than they typically experience? We studied family-supportive supervision (FSS) and perceived organizational support (POS) to test how changes in the perception of support in response to the COVID-19 pandemic may influence workers. Three waves of survey data from 368 workers in the United States and Canada were collected as the human and economic toll of COVID-19 manifested. Random-intercepts cross-lagged panel analyses were used to differentiate between stable associations and the within-person changes of interest. Stable associations among variables were consistent with prior research, but cross-lagged effects painted a complex picture that offered reasons for hope and concern. As hypothesized, we observed evidence for gain cycles such that there were reciprocal positive associations between FSS and POS, and higher-than-normal POS was associated with greater job satisfaction. However, remaining hypotheses were not supported, as changes in FSS and POS were not significantly associated with job insecurity, and heightened FSS was associated with higher levels of anxiety and depression. Our study reinforces

prior findings by showing that employees generally benefit when working for supportive supervisors and organizations, while also suggesting that episodic changes in FSS and POS may have limited impacts on workers.

King, Frederick

King, F. D., & Kabat-Farr, D. (2022). Student stress in focus: Short-term fixes and long-term pedagogical change in business school curriculum. *International Journal of Management Education*, 20(1). <https://doi.org/10.1016/j.ijme.2022.100605>

This paper explores course design and curriculum decisions made to acknowledge the contextual and personal stressors experienced by business school students. Business school professors have an opportunity to promote an active orientation to stress management, teach stress management skills, and link these practices to students' lives beyond academia. We use a lens of intersectionality to understand the human experience of stress and coping, connecting research from the management, psychology, biology, and sociology literatures to reveal a more complicated picture of stress for students in the 2020–2021 academic year. We then examine recent pedagogical changes in two business courses, Personal and Professional Development I for first-year students and Organizational Behaviour for second year students, as we discuss how many stressors can be addressed at the course-design level (through principles of simplicity, predictability, and consistency) as well as through module design (by creating community and connections to services, societies, and supports). Rather than viewing pandemic-induced course modifications as a temporary “fix” for the current situation, professors can use this time to re-imagine the importance of student stress in the learning process. We offer recommendations for long-term change to business school curriculum to accomplish this goal.

King, Tisha

Farrar, J., & **King, T.** (2022). To Punish or Not to Punish? The Impact of Tax Fraud Punishment on Observers' Tax Compliance. *Journal of Business Ethics*. <https://doi.org/10.1007/s10551-022-05061-w>

This article synthesizes insights from deterrence theory and social psychology literature on retributive justice to develop and test a theoretical model which predicts how and why observers' tax compliance intentions are influenced by knowledge of the punitive outcomes faced by individuals found guilty of tax fraud. We test our model experimentally on a sample of Canadian taxpayers and manipulate perceived responsibility for a fraud and whether a fraud perpetrator is punished. We show that observers' tax compliance increases when a fraud perpetrator is punished only when the perpetrator is perceived as blameworthy. The psychological process through which this positive influence operates is relatively complex, as it includes perceptions of punishment deservingness and affect. We also find that tax compliance decreases when a tax fraud perpetrator is unpunished, regardless of perceived blameworthiness. Our results are robust when we control for economic determinants known to influence fraud. The article concludes by discussing our findings' implications for fraud research and policy.

Lee, Kyung Young

Lee, K.Y., Han, S., Shin, S.I. and Yang, S.-B. (2022), Investigating the net benefits of contactless technologies in quick-service restaurants: the moderating roles of social interaction anxiety and language proficiency, *Internet Research*, <https://doi.org/10.1108/INTR-07-2021-0462>

Purpose: This study aims to apply the information system success model (ISSM) to examine the relationships among actual use, use continuance intention, user satisfaction and net benefits in the context of quick-service restaurant (QSR) patrons using two contactless technologies (CT): self-service kiosks (SSK) and mobile applications (MA) for food ordering. The study also investigates the moderating roles of social interaction anxiety (SIA) and language proficiency (LP) in the abovementioned relationships. **Design/methodology/approach:** Survey data from 421 QSR patrons with experience using McDonald's SSK and MA were collected and analyzed through a seemingly unrelated regressions (SUR) technique. **Findings:** Research findings reveal positive associations among actual use, use continuance intention and satisfaction with CT (i.e. SSK and MA). The actual use and satisfaction with CT are positively associated with individual benefits, leading to improved patron satisfaction with QSR. Findings also reveal that, in the case of MA, SIA positively moderates relationships between actual use/satisfaction and individual benefits and between satisfaction and organizational benefit, while LP shows negative moderating effects on those relationships. **Originality/value:** This study is one of the first attempts to present empirical evidence of constructs in the ISSM (actual use, use continuance intention, satisfaction and individual/organizational benefits) in the context of QSR patrons using SSK and MA. It also shows that using MA can address some patrons' psychological problems interacting with others in their food-ordering processes.

Shin, S.I., **Lee, K.Y.**, Hall, D.J., (2022). Examining the role of perceived social benefit and trust matter in sustainability of online social networking community - social exchange theory perspective. *International Journal of Web Based Communities*, 18(2), 109-129. <https://doi.org/10.1504/ijwbc.2022.124758>

Based on social exchange theory (SET), the current study examines how perceived social benefit from social networking community (SNC) activities influences community members' affective commitment to the SNC via satisfaction. Additionally, we investigated how SNC members' trust defined as securing personal privacy and information in the community moderates the relationships between satisfaction and affective commitment. Analysing survey data collected from Facebook users, our findings reveal that SNC members' perceived social benefit and trust play salient roles in explaining members' affective commitment to SNCs. Moreover, trust plays an important role in moderating the relationships between SNC members' perceptions. The current study contributes to the body of knowledge on social networking, web-based communities and social exchange theory literature. Detailed implications and limitations are discussed.

Lee, M., Song, Y. H., Li, L., **Lee, K. Y.**, & Yang, S.-B. (2022). Detecting fake reviews with supervised machine learning algorithms | 用监督式机器学习算法检测虚假评论. *Service Industries Journal*, 42(13-14), 1101-1121. <https://doi.org/10.1080/02642069.2022.2054996>

This study provides an applicable methodological procedure applying Artificial Intelligence (AI)-based supervised Machine Learning (ML) algorithms in detecting fake reviews of online review platforms and identifies the best ML algorithm as well as the most critical fake review determinants for a given restaurant review dataset. Our empirical findings from analyzing 16 determinants (review-related, reviewer-related, and linguistic attributes) measured from over 43,000 online restaurant reviews reveal that among the seven ML algorithms, the random forest algorithm outperforms the other algorithms and, among the 16 review attributes, time distance is found to be the most important, followed by two linguistic (affective and cognitive cues) and two review-related attributes (review depth and structure). The present study contributes to the literature on fake online review detection, especially in the hospitality field and the body of knowledge on supervised ML algorithms.

MacDonald, Bertrum H.

Yet, M., Manuel, P., DeVidi, M., & **MacDonald, B. H.** (2022). Learning from experience: Lessons from community-based engagement for improving participatory marine spatial planning. *Planning Practice & Research*, 37(2), 189-212. <https://doi.org/10.1080/02697459.2021.2017101>

Marine spatial planning (MSP) is critiqued for inadequate stakeholder engagement practices, particularly for determining community-level interests. Community engagement is foundational to community planning, a local-level process in terrestrial planning. This study compared the community engagement experiences of practitioners in local and national-level organizations in Nova Scotia, Canada, likely to participate in MSP to participatory best practice principles identified in the terrestrial planning and environmental management literature. Giving more attention to knowledge and skills of local government and community groups could strengthen participatory practices in MSP, link community and marine planning, and increase the relevance of MSP for coastal community development.

McManus, Justin

McManus, J. F., & Carvalho, S. W. (2022). Consumers' love for technological gadgets is linked to personal growth. *Personality and Individual Differences*, 194. <https://doi.org/10.1016/j.paid.2022.111637>

Loving technological gadgets could be considered an expression of material values, and thereby a behavior that is associated with reduced well-being. In two studies (N = 926, American and Canadian adults), we investigate whether gadget loving is associated with indicators of well-being that, to date, have gone undocumented by research. Results from a pilot study show that although people, overall, perceive technological gadgets to be materialistic purchases (compared to all tested product categories) and consumers of these products to be materialistic people (particularly when gadgets are purchased for novelty vs. utility), individual differences in gadget loving are most associated with learning motives rather than motives associated with materialism (e.g., status signaling). Results from the main study (a cross-sectional survey wherein participants completed individual difference measures of gadget loving, orientation-to-happiness, competence, and personal growth) indicate that (1) gadget loving interacts with an orientation-to-engagement (but not pleasure) to relate to greater personal growth, and (2) this interaction is explained by increases in competence. These results contravene the assumption that gadget loving is solely a manifestation of materialism.

McManus, J. F., Carvalho, S. W., & Trifts, V. (2022). The role of brand personality in the formation of consumer affect and self-brand connection. *Journal of Product and Brand Management*, 31(4), 551–569. <https://doi.org/10.1108/JPBM-08-2020-3039>

Purpose: This study aims to explore the role of brand personality traits in explaining how different levels of brand favorability evoke affect from and forge connections to consumers.

Design/methodology/approach: The authors used a quantitative approach consisting of within-subjects (Study 1) and between-subjects (Study 2) experimental designs. Mediation analyses were tested using OLS regression with the MEMORE and PROCESS macros. **Findings:** Findings suggest increases in brand excitement and sincerity to be related to differences in positive affect evoked by favorable and unfavorable brands; decreases in brand sincerity to be related to differences in negative affect between favorable and unfavorable brands (Study 1); brand competence and excitement to be related to the relationship between brand favorability and self-brand connection; and brand competence and excitement to best distinguish favorable brands from unfavorable brands (Study 2). **Originality/value:** These results support the importance of brand personality traits

that are considered to be universally positive and provide managers with an initial roadmap for which brand personality traits should be prioritized when communicating with consumers.

Medeiros, Andrew

Medeiros, A. S., Chipman, M. L., Francis, D. R., Hamerlík, L., Langdon, P., Puleo, P. J. K., Schellinger, G., Steigleder, R., Walker, I. R., Woodroffe, S., Woodroffe, S., & Axford, Y. (2022). A continental-scale chironomid training set for reconstructing Arctic temperatures. *Quaternary Science Reviews*, 294. <https://doi.org/10.1016/j.quascirev.2022.107728>

We present chironomid species assemblage data from 402 lakes across northern North America, Greenland, Iceland, and Svalbard to inform interpretations of Holocene subfossil chironomid assemblages used in paleolimnological reconstruction. This calibration-set was developed by re-identifying and taxonomically harmonizing chironomids in previously described surface sediment samples, with identifications made at finer taxonomic resolution than in original publications. The large geographic coverage of this dataset is intended to provide climatic analogues for a wide range of Holocene climates in the northwest North Atlantic region and North American Arctic, including Greenland. For many of these regions, modern calibration data are sparse despite keen interest in paleoclimate reconstructions from high latitudes. A suite of chironomid-based temperature models based upon this training set are evaluated here and the best statistical model is used to reconstruct late glacial (Allerød and Younger Dryas) and Holocene paleotemperatures at five non-glacial lakes representing a wide range of climate zones across Greenland. The new continent-scale training set offers more analogues for the majority of Greenland subfossil assemblages than existing smaller training sets, with many in Iceland and northern Canada. We find strong agreement between chironomid-based reconstructions derived from the new model and independent glacier-based evidence for multi-millennial Holocene temperature trends. Some of the new Holocene reconstructions are very similar to published data, but at a subset of sites and time periods we find improved paleotemperature reconstructions attributable both to the new model's finer taxonomic resolution and to its expanded geographic/climatic coverage, which resulted in improved characterization of species optima. In the late glacial, the new model's finer taxonomic resolution yields a unique ability to resolve temperatures of the Allerød from colder temperatures of the Younger Dryas, although the magnitude of that temperature difference may be underestimated. This study demonstrates the value of geographically and climatically broad paleoecological training sets. The large, taxonomically harmonized dataset presented here should be useful for a wide range of future investigations, including but not limited to paleotemperature reconstructions across the Arctic.

Milošević, D., **Medeiros, A. S.**, Cvijanović, D., Jenačković Gocić, D., Đurđević, A., Čerba, D., & Stojković Piperac, M. (2022). Implications of local niche- and dispersal-based factors that may influence chironomid assemblages in bioassessment. *Environmental Science and Pollution Research*, 29(34), 51951–51963. <https://doi.org/10.1007/s11356-022-19302-y>

Local environmental factors and dispersal-based processes can both influence the structure of metacommunities in freshwater ecosystems. Describing these patterns is especially important for biomonitoring approaches that are based on inferences made from benthic macroinvertebrate assemblages. Here, we examine the metacommunity structure of chironomid assemblages collected from 28 sampling stations along the Southern Morava River, Serbia. We examined the extent of dispersal-based processes along a temporal scale. We obtained 8 models for the different sampling seasons that determined the spatial variables that best explained variability in chironomid assemblages. Spatial processes were found to be a significant predictor of variation for chironomids during the late winter/spring (March and May) and autumn (October and November), concordant with the known phenology of common taxa. Species sorting and mass effects were found to be

significant processes that structured the chironomid metacommunity. In addition, biological interactions, inferred from fish biomass, and habitat traits, demonstrated by macrophyte and riparian vegetation, were found to influence species sorting. A high variability of chironomid metacommunity structure across sampling seasons suggests that monitoring programs that include macroinvertebrates in bioassessment should avoid months with pronounced spatial processes, and consequently maximize a correlation between community structure and local environmental factors.

Milošević, D., **Medeiros, A. S.**, Stojković Piperac, M., Cvijanović, D., Soininen, J., Milosavljević, A., & Predić, B. (2022). The application of Uniform Manifold Approximation and Projection (UMAP) for unconstrained ordination and classification of biological indicators in aquatic ecology. *Science of the Total Environment*, 815. <https://doi.org/10.1016/j.scitotenv.2021.152365>

The analysis of community structure in studies of freshwater ecology often requires the application of dimensionality reduction to process multivariate data. A high number of dimensions (number of taxa/environmental parameters \times number of samples), nonlinear relationships, outliers, and high variability usually hinder the visualization and interpretation of multivariate datasets. Here, we proposed a new statistical design using Uniform Manifold Approximation and Projection (UMAP), and community partitioning using Louvain algorithms, to ordinate and classify the structure of aquatic biota in two-dimensional space. We present this approach with a demonstration of five previously published datasets for diatoms, macrophytes, chironomids (larval and subfossil), and fish. Principal Component Analysis (PCA) and Ward's clustering were also used to assess the comparability of the UMAP approach compared to traditional approaches for ordination and classification. The ordination of sampling sites in 2-dimensional space showed a much denser, and easier to interpret, grouping using the UMAP approach in comparison to PCA. The classification of community structure using the Louvain algorithm in UMAP ordinal space showed a high classification strength for data with a high number of dimensions than the cluster patterns obtained with the use of a Ward's algorithm in PCA. Environmental gradients, presented via heat maps, were overlayed with the ordination patterns of aquatic communities, confirming that the ordinations obtained by UMAP were ecologically meaningful. This is the first study that has applied a UMAP approach with classification using Louvain algorithms on ecological datasets. We show that the performance of local and global structures, as well as the number of clusters determined by the algorithm, make this approach more powerful than traditional approaches.

Molloy, S., **Medeiros, A. S.**, **Walker, T. R.**, & Saunders, S. J. (2022). Public Perceptions of Legislative Action to Reduce Plastic Pollution: A Case Study of Atlantic Canada. *Sustainability (Switzerland)*, 14(3). <https://doi.org/10.3390/su14031852>

Government-led legislation is a key strategy to reduce plastic pollution; however, societal perception can heavily influence government intervention for environmental issues. To understand the public acceptability of government action to reduce plastic pollution, we examine the perception of existing and upcoming legislative action on single-use plastics (SUPs) by means of a structured survey with additional semi-structured interviews. Our focus is on the four Atlantic provinces of Canada, which was the first region in Canada to implement provincial-wide legislation for plastic reduction at the consumer level in 2019. Results show strong public support (77%, $n = 838$) for bans of SUP bags at the consumer level, and for further plastic pollution reduction legislation. However, the level of support differed between regions and by demographics. Semi-structured interviews show that decision makers should increase efforts in raising consumer awareness and standardizing regulations across jurisdictions for smoother transitions prior to legislative action.

Niemeyer, A. M., **Medeiros, A. S.**, Todd, A., & Wolfe, B. B. (2022). Identifying the influence of terrestrial–aquatic connectivity on palaeoecological inferences of past climate in Arctic lakes. *Boreas*, 51(2), 451–464. <https://doi.org/10.1111/bor.12572>

Increased hydrological connectivity due to permafrost degradation is likely to have substantial implications for shallow aquatic systems common to sub-arctic landscapes due to changes to overland and subsurface flow of water and transport of sediments and dissolved nutrients. Here, we explore the influence of increased connectivity on aquatic productivity based on multi-parameter palaeolimnological analysis of two lakes located near Inuvik (Northwest Territories, Canada). We contrast a lake with little evidence of permafrost degradation in the surrounding area (Lake PG03) to one that has multiple connections to the terrestrial landscape through a network of thaw polygons in the lake catchment (Lake PG09). Comparisons of biological indicators (chironomids) and organic carbon and nitrogen elemental and isotope composition reveal recent divergent lake histories. The chironomid assemblage of Lake PG03 followed an expected temperature gradient, with a warming signal evident since ~1970 CE, whereas the chironomid assemblage of Lake PG09 was found to primarily respond to nutrient availability and changes in habitat, likely as a result of increasing hydrological connectivity to the landscape. Rapid assemblage and habitat change along with a prominent increase in chironomid abundance were observed at Lake PG09 after ~1960 CE, following a shift to greater inputs from the terrestrial environment as indicated by high C:N ratios (>15) and low $\delta^{13}\text{C}_{\text{org}}$ (-30‰). Increased aquatic productivity following high allochthonous additions (~1960–2014 CE) is supported by decreased C:N and rapidly increasing organic matter (Corg, N). These results demonstrate that increased connectivity along the terrestrial–aquatic interface for lakes is likely to foster elevated productivity in the future. Likewise, increased production poses a challenge to chironomid-inferred July air temperature reconstructions in lakes that are less resilient to secondary gradients, where analogue mismatches can occur due to shifts in dominance of indicators that are orthogonal to the temperature gradient.

Puleo, P. J. K., Masterson, A. L., **Medeiros, A. S.**, Schellinger, G., Steigleder, R., Woodroffe, S., Osburn, M. R., & Axford, Y. (2022). Younger Dryas and early Holocene climate in south Greenland inferred from oxygen isotopes of chironomids, aquatic Moss, and Moss cellulose. *Quaternary Science Reviews*, 296. <https://doi.org/10.1016/j.quascirev.2022.107810>

Ice core records have long indicated that the Younger Dryas began and ended with large, abrupt climate shifts over Greenland. Key climatic features remain unknown, including the magnitude of warming during the Younger Dryas–Holocene transition along with the seasonality and spatial variability of Younger Dryas climate changes across Greenland. Here, we use geochemical and paleoecological proxies from lake sediments at Lake N14 in south Greenland to address these outstanding questions. Radiocarbon dating and diatom assemblages confirm early deglaciation and isolation of Lake N14 before ~13,600 cal yr BP, consistent with previous work. Oxygen isotope ratios ($\delta^{18}\text{O}$) of chironomid head capsules, bulk aquatic moss, and aquatic moss-derived cellulose are used to reconstruct oxygen isotopes of past lake water and annual precipitation. Oxygen isotope proxies indicate annual precipitation $\delta^{18}\text{O}$ values increased by 5.9–7.7‰ at the end of the Younger Dryas. Following the Younger Dryas, moss and cellulose $\delta^{18}\text{O}$ values show a clear decline in precipitation $\delta^{18}\text{O}$ values of 2–3‰ from ~11,540–11,340 cal yr BP that may correspond with the Preboreal Oscillation. Reconstructed precipitation $\delta^{18}\text{O}$ values then gradually increased from 11,300–10,100 cal yr BP. All three aquatic organic materials register similar shifts in precipitation $\delta^{18}\text{O}$ values over time, and they closely parallel the $\delta^{18}\text{O}$ shifts observed in ice cores. This evidence strongly supports the utility of these methods for reconstructing lake water $\delta^{18}\text{O}$, and furthermore precipitation $\delta^{18}\text{O}$ values where lake water reflects precipitation. The relatively large shift in isotopic composition of precipitation at Lake N14 suggests that shifts in temperature, precipitation seasonality, and/or moisture sources at the end of the Younger Dryas were even larger in south Greenland than they were in central Greenland, most likely because of the proximity to major

changes in North Atlantic Ocean circulation. The annual air temperature change estimated at Lake N14 at the end of the Younger Dryas is also very large ($\sim 18 \pm 7^\circ\text{C}$) compared to the summer warming previously inferred from chironomid species assemblages there ($\sim 6^\circ\text{C}$). This indicates that the strongest warming at the end of the Younger Dryas occurred in the winter season, consistent with past observations of intensified Younger Dryas seasonality at Lake N14 and elsewhere in Greenland.

Watson, V. T., Kehler, D., & **Medeiros, A. S.** (2022). A paleolimnological context of ecological vulnerability for the freshwater ecosystems of Sable Island National Park Reserve, Canada. *Science Progress*, 105(4). <https://doi.org/10.1177/00368504221126865>

Protected areas require long-term monitoring to understand the influence and extent of ecosystem stress to inform management and conservation decisions. As long-term data are not always available, paleolimnological methods offer a way of extending our knowledge of past environmental conditions necessary to use as context for remediation. Here, we examine four sediment cores and additional surface sediments from 14 ponds located on Sable Island National Park Reserve Canada (SINPR), where long-term ecological changes and vulnerability to disturbance are not well defined. We develop a paleolimnological approach to assessing environmental vulnerability through the use of biological indicators (Diptera: Chironomidae), where shifts in the environment are inferred by shifts in chironomid assemblages over time. Analysis of surface sediments show four distinct assemblage types reflecting four different habitat conditions; primarily represented by the presence of *Glyptotendipes*, *Chironomus*, *Microtendipes*, and *Dicoretendipes*. Differences in habitat conditions through time based on these results are then compared to biostratigraphic analysis of sediment cores from four of the ponds. We found that two ponds had large shifts in chironomids assemblages that were associated with changes in habitat over time, while two others that were not as exposed to the influence of erosion and influx of sand dunes did not. Our findings established a baseline of historical change in SINPR, broadening the scope of long-term monitoring, which is essential for defining goals for management and conservation of the ecological integrity of Sable Island.

Mongeon, Philippe

Sauvé, J.-S., **Mongeon, P.**, & Larivière, V. (2022). From art to science: A bibliometric analysis of architectural scholarly production from 1980 to 2015. *PLoS ONE*, 17 (11 November). <https://doi.org/10.1371/journal.pone.0276840>

According to recent literature on "architecture" as a discipline, practical knowledge relevant to its process of making has decreased in importance in favor of a more academic approach. Using data derived from Ulrich's Periodical Directory and Clarivate Analytics's Web of Science, this paper suggests providing empirical evidence supporting of such shift, as revealed by an overview of the dissemination practices in architecture scholarly production between 1980 and 2015. Our results support that architecture is becoming increasingly academic, as demonstrated by the growing proportion of articles and journals intended for scholars rather than for professionals. We also show that architecture is increasingly global, with decreased interest in local and/or national issues and the growing prevalence of English as a publication language. Finally, this academic focus is manifested in references cited by architectural papers with the gradual substitution of professional and artistic oriented knowledge, for scientific approaches tied to engineering and technology.

Simard, M.-A., Ghiasi, G., **Mongeon, P.**, & Larivière, V. (2022). National differences in dissemination and use of open access literature. *PLoS ONE*, 17(8 August). <https://doi.org/10.1371/journal.pone.0272730>

Open Access (OA) dissemination has been gaining a lot of momentum over the last decade, thanks to the implementation of several OA policies by funders and institutions, as well as the development

of several new platforms that facilitate the publication of OA content at low or no cost. Studies have shown that nearly half of the contemporary scientific literature could be available online for free. However, few studies have compared the use of OA literature across countries. This study aims to provide a global picture of OA adoption by countries, using two indicators: publications in OA and references made to articles in OA. We find that, on average, low-income countries are publishing and citing OA at the highest rate, while upper middle-income countries and higher-income countries publish and cite OA articles at below world-average rates. These results highlight national differences in OA uptake and suggest that more OA initiatives at the institutional, national, and international levels are needed to support wider adoption of open scholarship.

Nosoohi, Iman

Nosoohi, I. (2022). Posted price and name-your-own-price in a product line design problem. *Journal of Retailing and Consumer Services*, 64. <https://doi.org/10.1016/j.jretconser.2021.102836>

In this research, we address Name your own price (NYOP) as a mechanism to offer products with transparent, rather than opaque, quality levels. We compare posted price (PP) and NYOP in a product line design problem from a firm's viewpoint. We first consider the firm offering two vertically differentiated products that each can be priced by NYOP or PP. The quality level of products is considered either as a decision variable or as a fixed predetermined value for the firm. A customer correspondingly decides which product to purchase and if applicable, the bid at NYOP. We characterize both the customer's and the firm's decisions under four possible pricing scenarios. The results show that, it is most profitable for the firm to use PP for both products. We then consider if each product is offered by a competitive firm, where quality levels might again be decision variables or fixed. Results show that both competitive firms prefer PP to NYOP when they can create quality differentiation. The firm that offers the product with a lower quality level prefers PP to NYOP for all combinations of fixed quality levels as well. The other firm, with a higher quality level, also usually prefers PP to NYOP; However, it can be better off using NYOP when fixed quality levels are large and close enough to each other. In this case, the preference of NYOP over PP increases as customers' willingness to pay enhances.

Roach, David

Alamdari, H. H., Hacquebard, L., Driscoll, S., El-Sankary, K., **Roach, D. C.**, Leblanc, R., Lowe, S., Oore, S., Penzel, T., Fietze, I., Schmidt, M., & Morrison, D. (2022). High Frequency-Low Amplitude Oscillometry: Continuous Unobtrusive Monitoring of Respiratory Function on PAP Machines. *IEEE Transactions on Biomedical Engineering*, 69(7), 2202–2211. <https://doi.org/10.1109/TBME.2021.3138965>

Oscillometry or Forced Oscillation Technique, traditionally used in intermittent clinical measurements, has recently gained substantial attention from its application as a continuous monitoring tool for large and small airways. However, low frequency (<8 Hz) continuous oscillometry faces high breathing noise, and hence requires high oscillation amplitudes to maintain an acceptable signal-to-noise ratio. Therefore, PAP machines that utilize low frequency oscillometry do so intermittently to distinguish airway patency several seconds after a breathing pause has occurred. We hypothesized that high frequency and low amplitude (HFLA) oscillometry may be as sensitive and applicable for monitoring upper airway patency to distinguish between central and obstructive apnea and hypopnea events, and for monitoring respiratory impedance. An inline oscillometry prototype device was developed and connected to commercial PAP machines to test whether oscillometry at 17, 43, and 79 Hz are as sensitive to airway patency as oscillometry at 4 Hz. Analysis of 11 patients with 171 apneas and hypopneas showed that all frequency oscillometry inputs were equally sensitive in distinguishing between central and obstructive apneas, while 17 Hz

and 43 Hz oscillometry were most sensitive in distinguishing between central and obstructive hypopneas. Observations during normal breathing also showed the same periodicity and cross-correlation between impedance measurements from HFLA oscillometry compared to 4 Hz. Our findings provide an unobtrusive means of distinguishing airway patency during sleep and a means of continuous monitoring of respiratory function, with the potential for detection and prediction of developing respiratory diseases and significantly richer context for data analytics.

Ryman, J. A., & **Roach, D. C.** (2022). Innovation, effectuation, and uncertainty. *Innovation: Organization and Management*. <https://doi.org/10.1080/14479338.2022.2117816>

Innovation theory clearly differentiates between innovation processes and entrepreneurial processes through its distinction between uncertainty and risk. The authors' premise is that innovation and entrepreneurship are interdependent, where the role of the innovator is to reduce uncertainty, while the role of the entrepreneur is to manage uncertainty to a point where risk can be assessed. Taking an effectual innovation approach, innovation is modelled as uncertainty management requiring experimentation and flexibility, while entrepreneurial risk management is modelled as pre-commitments and affordable loss. Using data from the innovation processes of 169 US SMEs, the authors propose and test an exploratory empirical model which distinguishes uncertainty from risk and its impact on innovation and firm performance. The authors contend that once uncertainty and risk management aspects are isolated, their relationship to innovation performance can be investigated. The results indicate that uncertainty management does positively impact innovation performance, while a risk management approach impacts firm performance. Our model suggests that it may be helpful to segregate uncertainty and risk at the entrepreneurship–innovation interface.

Roy, Jeffrey

Roy, J. (2022). COVID-19, digitization and hybrid workspaces: A critical inflection point for public sector governance and workforce development. *Canadian Public Administration*, 65(3), 569–575. <https://doi.org/10.1111/capa.12475>

[No abstract]

Sawicki, Julia

Edirisinghe, C., **Sawicki, J.**, **Zhao, Y.**, & **Zhou, J.** (2022). Predicting credit rating changes conditional on economic strength. *Finance Research Letters*, 47. <https://doi.org/10.1016/j.frl.2022.102770>

This paper develops a new structural model for predicting credit rating changes using firms' accounting data in a regime-switching multinomial logistic regression analysis. The empirical analysis indicates that the probabilities of upgrade, downgrade, or no-change, are asymmetric across economic regimes. The asymmetry of credit rating changes between the high and low credit-rated firms appears to be significantly different. While high credit-rated firms' upgrade probabilities do not differ in expansions and contractions, low credit-rated firms' upgrade probabilities are significantly asymmetric in expansions and contractions. Furthermore, the probabilities of downgrade appear to be asymmetric in expansions and contractions for most of the credit rating levels.

Sherren, Kate

Fischer, J., Abson, D. J., Dorresteyn, I., Hanspach, J., Hartel, T., Schultner, J., & **Sherren, K.** (2022). Using a leverage points perspective to compare social-ecological systems: a case study on rural landscapes. *Ecosystems and People*, 18(1), 119–130. <https://doi.org/10.1080/26395916.2022.2032357>

A leverage points perspective recognises different levels of systemic depth, ranging from the relatively shallow levels of parameters and feedbacks to the deeper levels of system design and intent. Analysing a given social-ecological system for its characteristics across these four levels of systemic depth provides a useful diagnostic to better understand sustainability problems, and can complement other types of cause-and-effect systems modelling. Moreover, the structured comparison of multiple systems can highlight whether sustainability challenges in different systems have a similar origin (e.g. similar feedbacks or similar design). We used a leverage points perspective to systematically compare findings from three in-depth social-ecological case studies, which investigated rural landscapes in southeastern Australia, central Romania, and southwestern Ethiopia. Inductive coding of key findings documented in over 60 empirical publications was used to generate synthesis statements of key findings in the three case studies. Despite major socioeconomic and ecological differences, many synthesis statements applied to all three case studies. Major sustainability problems occurred at the design and intent levels. For example, at the intent level, all three rural landscapes were driven by goals and paradigms that mirrored a productivist green revolution discourse. Our paper thus highlights that there are underlying challenges for rural sustainability across the world, which appear to apply similarly across strongly contrasting socioeconomic contexts. Sustainability interventions should be mindful of such deep similarities in system characteristics. We conclude that a leverage points perspective could be used to compare many other types of social-ecological systems around the world.

Jarić, I., Roll, U., Bonaiuto, M., Brook, B.W., Courchamp, F., Firth, J.A., Gaston, K.J., Heger, T., Jeschke, J.M., Ladle, R.J., Meinard, Y., Roberts, D.L., **Sherren, K.**, Soga, M., Soriano-Redondo, A., Veríssimo, D., Correia, R.A. (2022). Societal extinction of species. *Trends in Ecology and Evolution*. 37 (5), pp. 411-419. <http://doi.org/10.1016/j.tree.2021.12.011>

The ongoing global biodiversity crisis not only involves biological extinctions, but also the loss of experience and the gradual fading of cultural knowledge and collective memory of species. We refer to this phenomenon as ‘societal extinction of species’ and apply it to both extinct and extant taxa. We describe the underlying concepts as well as the mechanisms and factors that affect this process, discuss its main implications, and identify mitigation measures. Societal extinction is cognitively intractable, but it is tied to biological extinction and thus has important consequences for conservation policy and management. It affects societal perceptions of the severity of anthropogenic impacts and of true extinction rates, erodes societal support for conservation efforts, and causes the loss of cultural heritage.

Sherren, K., Hodbod, J., MathisonSlee, M., Chappell, E., & King, M. (2022). Adaptive multi-paddock grazing and wellbeing: uptake, management practices and mindset among Canadian beef producers. *Agroecology and Sustainable Food Systems*, 46(9), 1304–1329. <https://doi.org/10.1080/21683565.2022.2107597>

Adaptive multi-paddock (AMP) grazing practices have been debated based on production, environmental and workload impacts, but farmer wellbeing is only beginning to be explored. A panel-based online survey of 200 Canadian beef producers was undertaken in early 2020 with a descriptive aim to explore the uptake, management, mindsets, and wellbeing implications associated with AMP grazing. AMP practices were more common than expected (29%) as well as distinct in grazing regime, featuring fast rotation, and long rests. AMP ranchers reported high physical wellbeing, as well as systems thinking, nontraditional values, a priority for enjoying life and

tendency to use a wide range of modes to learn about grazing. Other dimensions of wellbeing, environmental motivations, and gender dimensions suggested by smaller-n studies were not associated with AMP grazing in this work. These insights are important as the federal government begins to promote AMP grazing and its variants as strategies to combat climate change. More nuanced understanding of adaptive grazing and its trajectory would be possible via consistent, longitudinal surveys with improved operationalization of wellbeing concepts, more detailed exploration of educational background, inclusion of religious beliefs, and elucidation of management characteristics beyond grazing regime variables.

Sherren, K., Sutton, K., & Chappell, E. (2022). Climax thinking on the coast: a focus group priming experiment with coastal property owners about climate adaptation. *Environmental Management*, 70(3), 475–488. <https://doi.org/10.1007/s00267-022-01676-x>

Coastal communities face increasingly difficult decisions about responses to climate change. Armoring and defending the coast are being revealed as ineffective in terms of outcomes and cost, particularly in rural areas. Nature-based options include approaches that make space for coastal dynamism (e.g., through managed retreat) or leverage ecosystem services such as erosion control (e.g., by restoring coastal wetlands). Resistance can be strong to these alternatives to hard infrastructure. Nova Scotia, off Canada's Atlantic coast, is a vulnerable coastal jurisdiction facing such decisions. The emerging climax thinking framework was used to design 14 experimental online focus groups. These focus groups explored how three priming treatments influenced discussions about adaptation options and urgency and quantitative pre/post-tests, compared with information-only control treatments. A future-focused priming strategy seemed most effective since it fostered discussions about duties to future generations. The altruism-focused priming strategy involved reflections of wartime mobilization and more recent collective action. It also worked but was more difficult to implement and potentially higher risk. Past-focused priming was counterproductive. Further research should test the future-focused and altruism-focused strategies among larger groups and in different jurisdictions, reducing some of the biases in our sample.

Soubry, B., & **Sherren, K. (2022).** "You keep using that word...": Disjointed definitions of resilience in food systems adaptation. *Land Use Policy*, 114. <https://doi.org/10.1016/j.landusepol.2021.105954>

What does resilience mean when it's applied to adapting the food system to climate change? The term is a "boundary object": it has multiple definitions which do not necessarily correspond. While this slippery state can serve to unite different actors, it can also be co-opted by government to twist transformative adaptation into maintaining the status quo. We compared the definitions of resilience between two datasets: the conclusions and responses to the Canadian government's recent inquiries into climate change and agriculture, and semi-structured interviews with small-scale farmers in the Canadian Maritimes (n = 37). The differences between the two suggest that government institutions may be creating policy which perpetuates status quo industrial agriculture without acknowledging farmers' differing conceptions of climate resilience for the food system. The findings highlight the need for the definition of resilience in climate and agriculture policy to be problematized and diversified. It corroborates the calls in adaptation theory for resilience to be understood as a normative term rather than a politically neutral one; and for broader inclusion of concerned stakeholders in consultations.

Sutton, K., Tonge, C., Berglund, L., Kerr, G., & **Sherren, K. (2022).** Coastal resident perceptions of nature-based adaptation options in Nova Scotia. *Canadian Geographer*. <https://doi.org/10.1111/cag.12818>

Climate change risks to coastal communities may overwhelm current management strategies. The emergence of nature-based solutions could provide alternative approaches for climate adaptation; however, studies on their public acceptability are limited. This research focuses on the human dimensions of nature-based coastal adaptation solutions. The research sought to understand the

kind of environmental changes participants were experiencing in their coastal communities of Nova Scotia and what management responses they observed being taken, if any. Online focus groups were held with coastal property owners in Nova Scotia to understand how they assess coastal risks and four approaches to nature-based coastal adaptation: living shorelines, accommodation, retreat, and dyke realignment to make space for wetland restoration. Results revealed ongoing trust in traditional hard-line approaches, but also interest in knowing more about nature-based options. There was general support for living shorelines, albeit with scepticism; a concern that accommodation is just a “band-aid” approach; resistance to retreat, despite general recognition of its future utility; and a lack of understanding of dyke realignment. The successful implementation of nature-based coastal adaptation approaches will require more evidence of their viability, better options for financing them, and engagement with communities around the best-fit alternatives for them.

Smit, Mike

Campbell-Yeo, M., Dol, J., McCulloch, H., Hughes, B., Hundert, A., Bacchini, F., Whitehead, L., Afifi, J., Alcock, L., Bishop, T., Simpson, C. D., & **Smit, M.** (2022). The Impact of Parental Presence Restrictions on Canadian Parents in the NICU During COVID-19: A National Survey. *Journal of Family Nursing*. <https://doi.org/10.1177/10748407221114326>

The purpose of this research was to explore parental perspectives on the impact of parent restrictions imposed in response to the COVID-19 pandemic across Canadian Neonatal Intensive Care Units (NICUs). A co-designed online survey was conducted targeting parents (n = 235) of infants admitted to a Canadian NICU from March 1, 2020, until March 5, 2021. Parents completed the survey from 38 Canadian NICUs. Large variation in the severity of policies regarding parental presence was reported. Most respondents (68.9%) were classified as experiencing high restrictions, with one or no support people allowed in the NICU, and felt that policies were less easy to understand, felt less valued and respected, and found it more challenging to access medicine or health care. Parents reported gaps in care related to self-care, accessibility, and mental health outcomes. There is significant variation in parental restrictions implemented across Canadian NICUs. National guidelines are needed to support consistent and equitable care practices.

McCulloch, H., Campbell-Yeo, M., Richardson, B., Dol, J., Hundert, A., Dorling, J., Whitehead, L., MacRae, G., Bishop, T., Afifi, J., Simpson, D. C., & **Smit, M.** (2022). The Impact of Restrictive Family Presence Policies in Response to COVID-19 on Family Integrated Care in the NICU: A Qualitative Study. *Health Environments Research and Design Journal*, 15(2), 49–62. <https://doi.org/10.1177/19375867211065178>

Objectives: To conduct a needs assessment with families and their healthcare team to understand the impact of restrictive family presence policies in the neonatal intensive care unit (NICU) in response to COVID-19. **Background:** In response to the COVID-19 pandemic, significant restrictive family presence policies were instituted in most NICUs globally intended to protect infants, families, and HCPs. However, knowledge on the impact of the stress of the pandemic and policies restricting family presence in the NICU on vulnerable neonates and their families remains limited. **Methods:** Individuals were eligible to participate if they were a caregiver of an infant requiring NICU care or a healthcare provider (HCP) in the NICU after March 1, 2020. Semi-structured interviews were conducted using a virtual communication platform, and transcripts were analyzed using inductive thematic qualitative content analysis. **Results:** Twenty-three participants were interviewed (12 families and 11 HCPs). Three themes emerged: (1) successes (family-integrated care, use of technology), (2) challenges (lack of standardized messaging and family engagement, impact on parental wellbeing, institutional barriers, and virtual care), and (3) moving forward (responsive and supportive leadership). **Conclusions:** Our findings highlight the significant impact of family

restrictions on the mental well-being of families, physical closeness with parents, and empathetic stress to HCPs. Further study of potential long-term impact is warranted.

Spiteri, Louise

Allam, H., Ahamed, J., **Spiteri, L.**, & Pandya, B. (2022). Students' Acceptance of Learning Management Systems in Higher Education: A UAE Case Study. 8th International Conference on Information Technology Trends: Industry 4.0: Technology Trends and Solutions, ITT 2022, 150–153. <https://doi.org/10.1109/ITT56123.2022.9863969>

It has been demonstrated that tools developed by information technology, such as Learning Management Systems (LMS), may considerably improve the performance and productivity of students in the classroom. As a result, several institutions of higher learning have implemented similar systems. The fact that LMS adoption rates in university education are increasing, as well as the necessity of evaluating the factors before the implementation of such a system at universities in UAE, increases the urgency of conducting a study in which the factors that predict the students to accept, adopt, and use LMS are examined. In this paper, we predict the factors that might have a full influence on students' acceptance of the Blackboard system in UAE colleges. We present our preliminary data resulting from our pilot study conducted on 89 students from different campuses and specializations. Our findings show that perceived productivity, system quality, and services quality offered by the LMS are the most significant factors in predicting students' acceptance of LMS.

Sundararajan, Binod

Crumley, E. T., Grandy, K., **Sundararajan, B.**, & Roy, J. (2022). Media interviews as strategic external communication to maintain legitimacy for sustainability activities. *Corporate Communications*, 27(1), 148–166. <https://doi.org/10.1108/CCIJ-05-2021-0053>

Purpose: The purpose of this paper is to examine the thematic content and inclusive language in leaders' media interviews to maintain legitimacy for organizational sustainability activities. **Design/methodology/approach:** An exploratory, qualitative content analysis of 24 organizational leaders' media interviews about environmental sustainability was conducted. Inclusive language (i.e. collective focus terms, collective personal pronouns, and metaphors) and thematic content were analyzed. **Findings:** Legitimacy maintenance entails both describing organizational sustainability activities and conveying, through the use of inclusive language, multiple audiences' connection to the organization. The qualitative content analysis found that leaders discussed both primary and secondary stakeholders. With the exception of the code defending existing practices, leaders consistently highlighted positive sustainability activities of their organizations. The inclusive language analysis found that collective focus terms were used by all the leaders, with the most common term being “everyone.” Collective personal pronouns were found in half the interviews. Metaphors were employed by all leaders; the most common sustainability-related metaphors were journey, structural, personification, military/competition, vision and science. **Research limitations/implications:** The sample is limited to 24 organizations and not representative of all industries. **Originality/value:** While sustainability communication research focuses on annual reports and website and social media content, this study draws attention to a common but under-examined type of strategic external communication: senior organizational leaders' media interviews. To the authors' knowledge, scholars have not previously considered the possible legitimacy maintenance function of organizational leaders' use of inclusive language and thematic content to address a broad array of stakeholders in their external communication.

Ohreen, D., **Sundararajan, B., Trifts, V., & Comber, S.** (2022). Vygotskian Business Ethics: The Influence of Peers on Moral Reasoning in Business Ethics Education. *Journal of Management Education*, 46(1), 70–105. <https://doi.org/10.1177/1052562921996019>

The Russian developmental psychologist Lev Vygotsky provides important theoretical underpinnings for an alternative to business ethics pedagogy. Although Vygotsky's constructivist approach has been applied to other disciplines, such as cognitive development, moral development, and network analysis and learning, its application to business ethics education is virtually nonexistent. Vygotsky's focus on language and peer influence provides a novel approach to ethics education. Although many business ethics instructors already use group discussion in their classes, we provide evidence that will reinforce such techniques as a crucial pedagogical method. This study is an exploratory application of Vygotsky's developmental theory to business ethics education. Data were gathered in business ethics and management courses, with experimental and control groups, and analyzed using the Defining Issues Test and thematic-coded journal entries. Results indicated that discussions created a zone of proximal development improving the moral reasoning for most students giving them multiple perspectives and providing support to engage in deliberations and peer dialogue when discussing ethical frameworks, ethical scenarios, and ethical decision making.

Sy, Oumar

El Ghouli, S., Guedhami, O., Mansi, S. A., & **Sy, O.** (2022). Event studies in international finance research. *Journal of International Business Studies*. <https://doi.org/10.1057/s41267-022-00534-6>

Event studies are widely used in finance research to investigate the implications of announcements of corporate initiatives, regulatory changes, or macroeconomic shocks on stock prices. These studies are often used in a single-country setting (usually the U.S.), but little work has yet been conducted in an international context, perhaps due to the complexities inherent in implementing cross-country studies. This paper explores the methodological challenges of conducting event studies in international finance research. We emphasize how scholars should choose an event, select the study period (short vs. long term), estimate abnormal returns, infer statistically whether the event under consideration produces a reliable price reaction, and explore the role of formal and informal institutions in explaining cross-country differences in price reactions. We also provide an extension of event studies to an important but less studied asset class in an international setting – the fixed-income market. We conclude by offering practical recommendations for researchers conducting cross-country finance event studies and identifying opportunities for future research. Given the increasing number of global events, such as the COVID-19 pandemic, Brexit, and the Paris and Trans-Pacific Partnership agreements, we believe our paper is especially timely.

Taylor, Samantha

Taylor, S., Sundararajan, B., & Munroe-Lynds, C. L. (2022). Live Long and Educate: Adult Learners and Situated Cognition in Game-Based Learning. In *Handbook of Research on Acquiring 21st Century Literacy Skills Through Game-Based Learning*. 194-219. IGI Global.

Using the lenses of Vygotskian constructivism, situated cognition, the antecedents of flow, and a pedagogy interwoven with the multiliteracy framework, the authors present a COVID-19 simulation game. The game has multiple levels, challenges, disrupters, and allows for student player groups to work together (i.e., collaborate within and across player groups) to achieve the strategic objectives of the game. The player groups have an overall goal to minimize loss of life, while other parameters need to be optimized, depending on the stakeholder group that the player group is role-playing. While the game can be digitized, it is presented in a manner that allows instructors to implement the game simulation right away in their classrooms. Assessment rubrics, decision matrix templates,

and debriefing notes are provided to allow for student learners to reflect on their decisions (based on course concepts) both individually and as a player group.

Toze, Sandra

Allam, H., Akre, V., Blustein, J., **Toze, S.**, & Kalota, F. (2022). Factors Affecting People's Adoption of Facebook: A UAE Case Study. 8th International Conference on Information Technology Trends: Industry 4.0: Technology Trends and Solutions, ITT 2022, 34–38. <https://doi.org/10.1109/ITT56123.2022.9863947>

The phenomenon of use of social media applications is rapidly increasing among the public and is on its way to be a social phenomenon. Why people use social media platforms in Arab countries is still an unanswered question. Although numerous studies have been conducted on technology acceptance, few studies were conducted on users' adoption and use of social media platforms in the UAE. We describe the Technology Acceptance Model (TAM) and its Motivation sub-model, and propose a study of how it can elucidate the dynamic environment of Facebook. We attempt to fill this gap in the literature and add personal productivity, communication, enjoyment, and information sharing as core factors influencing Facebook adoption in UAE. The identification of these factors would help enrich the literature regarding adoption and acceptance of social media technology in general and of Facebook in particular.

Turnbull, Lori

Turnbull, L., & Bernier, L. (2022). Executive decision-making during the COVID-19 emergency period. *Canadian Public Administration*, 65(3), 538–546. <https://doi.org/10.1111/capa.12494>

Beginning in March of 2020, the unprecedented circumstances of the COVID-19 pandemic caused a shift in the ways in which governments, and all organizations, performed many of their functions, including the ways in which they make decisions. In Westminster parliamentary democracies, the executive branch — with the support of the public service — has the capacity to respond quickly and decisively to matters at hand, which can make the system particularly well suited to deal with emergencies. However, the expedited approach can come at some cost in the sense that a higher tolerance for risk earlier in the process can create an increased need for problem-solving later on. This article explores how the Canadian government approached decision-making during the COVID-19 period, specifically within the period between March and August of 2020. Decision-making processes were truncated and modified to meet the challenges of the time, and the federal public service was widely praised for its nimbleness and responsiveness.

Tyedmers, Peter

Bamber, N., Johnson, R., Laage, E., Dias, G., **Tyedmers, P.**, & Pelletier, N. (2022). Life cycle inventory and emissions modelling in organic field crop LCA studies: review and recommendations. *Resources, Conservation and Recycling*, 185. <https://doi.org/10.1016/j.resconrec.2022.106465>

The purpose of this manuscript is to review LCA studies of organic field crops to identify best practices in collecting life cycle inventory data. Previous LCA studies of organic field crops from 2010 to 2021 were identified and data were collected in the following categories: 1) crops studied, 2) geographical locations and spatial resolution, 3) life cycle inventory data collected, 4) models used for estimating changes in soil carbon and for estimating field-level emissions and their associated data inputs. Based on these data, recommendations were made with respect to the best data to collect, and emissions and soil carbon models to use for LCAs of organic field crops. Based on the assessment of LCI inventory data collected for activities, inputs and emissions modelling, a list of

recommendations for future LCI data collection for organic field crops was tabulated. This included the data that should come directly from farmers, as well as data from secondary sources, and the specific models that can be used for soil carbon and emissions modelling. The recommendations made based on the LCI data identified can be used to inform data collection for high quality, regionally resolved LCAs of organic field crop production.

Bianchi, M., Hallström, E., Parker, R. W. R., Mifflin, K., **Tyedmers, P.**, & Ziegler, F. (2022). Assessing seafood nutritional diversity together with climate impacts informs more comprehensive dietary advice. *Communications Earth and Environment*, 3(1). <https://doi.org/10.1038/s43247-022-00516-4>

Seafood holds promise for helping meet nutritional needs at a low climate impact. Here, we assess the nutrient density and greenhouse gas emissions, weighted by production method, that result from fishing and farming of globally important species. The highest nutrient benefit at the lowest emissions is achieved by consuming wild-caught small pelagic and salmonid species, and farmed bivalves like mussels and oysters. Many but not all seafood species provide more nutrition at lower emissions than land animal proteins, especially red meat, but large differences exist, even within species groups and species, depending on production method. Which nutrients contribute to nutrient density differs between seafoods, as do the nutrient needs of population groups within and between countries or regions. Based on the patterns found in nutritional attributes and climate impact, we recommend refocusing and tailoring production and consumption patterns towards species and production methods with improved nutrition and climate performance, taking into account specific nutritional needs and emission reduction goals.

Ziegler, F., **Tyedmers, P.**, & Parker, R. W. R. (2022). Methods matter: Improved practices for environmental evaluation of dietary patterns. *Global Environmental Change*, 73. <https://doi.org/10.1016/j.gloenvcha.2022.102482>

Making food systems more sustainable is one of humanity's largest challenges. Over two decades of life cycle assessment research on the environmental performance of food systems has helped to inform efforts to address this challenge. In recent years, there has been much interest in aggregating the results of these studies at scales of national production, dietary patterns, and future food scenarios. The process of comparing impacts of diverse products based on extant literature presents numerous challenges which have been inadequately addressed. Drawing upon examples of greenhouse gas emissions and seafood systems, we suggest best practices to support more complete, consistent, and comparable aggregation practices. Ultimately this would lead to more robust industry and consumer decisions and public policy. We suggest to: 1) define product groups reflecting impact drivers and in accordance with study goals, 2) select studies in a transparent way whose methods are consistent, and 3) assess results in the context of actual production or consumption patterns. Applying these practices would strengthen food life cycle assessment aggregation studies as a tool guiding towards sustainable food systems.

Ülkü, M. Ali

Chadha, S. S., **Ülkü, M. A.**, & Venkatadri, U. (2022). Freight delivery in a Physical Internet Supply Chain: an applied optimisation model with peddling and shipment consolidation. *International Journal of Production Research*, 60(16), 4995–5011. <https://doi.org/10.1080/00207543.2021.1946613>

The delivery of goods (freight) accounts for the major cost and emissions in logistics systems worldwide. The effective management of the supply chain requires logistical efficiency and sustainability. Several logistics performance measurements such as distances driven and fuel efficiency are also indicators of sustainability. As an emerging paradigm, the Physical Internet (PI) addresses logistical, societal, and sustainability goals. However, the question remains whether some aspects of logistical efficiency in traditional logistics could be incorporated into the PI

paradigm. To this effect, we examine how peddling, a consolidation strategy in traditional logistics, can enhance PI supply chain. Specifically, we formulate optimisation models and study the case of a Mexican automotive supply chain from both the PI and traditional logistics perspectives by comparing three different configurations; namely, Model P built on PI, Model S based on conventional standard peddling, and Model H, a hybrid. The hybrid Model H is optimised in a two-phase solution framework. We show via the case of a Mexican automotive supply chain that Model H outperforms others on average distance travelled and truck utilisation. Thereby, it is concluded that appropriate peddling and shipment consolidation policies may enhance PI supply chain logistics performance.

Heydari, J., Bineshpour, P., Walther, G., & **Ülkü, M. A.** (2022). Reconciling conflict of interests in a green retailing channel with green sales effort. *Journal of Retailing and Consumer Services*, 64. <https://doi.org/10.1016/j.jretconser.2021.102752>

In this paper, we address conflicting objectives in a two-echelon retailer-manufacturer green retailing channel (GRC) with two types of substitutable green and non-green products. In the investigated model, the government pays (charges) the manufacturer a certain amount of subsidies (penalties) for producing green (non-green) products. The retailer can implement a green sales effort program to encourage customers to purchase green items instead of non-green products. In so doing, the retailer can transfer an uncertain amount of non-green demand to the green demand, while the total demand over both products remains constant. However, while producing green products is advantageous for the manufacturer due to governmental interventions, this is not the case for the retailer. To mitigate this conflict, we develop a game-theoretical model and a coordination mechanism that reconciles both members' interests. By applying the novel revenue-cost sharing along with a buyback (RCS&B) contract as an incentive mechanism, we mitigate conflicts and coordinate ordering and sales effort decisions throughout the channel. Our results show that the RCS&B contract may be quite effective in managing conflicting objectives toward aligning both GRC members' interests. The proposed contract creates an economically viable, ambidextrous GRC by devising Pareto-improving solutions.

Ling, Y., Xu, J., & **Ülkü, M. A.** (2022). A game-theoretic analysis of the impact of government subsidy on optimal product greening and pricing decisions in a duopolistic market. *Journal of Cleaner Production*, 338. <https://doi.org/10.1016/j.jclepro.2021.130028>

In compliance with environmental and emerging international imperatives, promoting sustainable consumption and production is far due and pivotal for greening supply chains. Rampant demand for environmentally-friendly products and regulatory changes have pressured manufacturing companies to reassess their products and processes. Yet, the cost of greening and its allocation remain challenging tasks. This study investigates government subsidy strategies to encourage firms to transition to green production strategies and improve environmental quality when heterogeneous consumers are sensitive to sustainability. We consider a leader-follower Stackelberg game between two profit-maximizing firms with different green technologies (the followers) and a government (the leader). Those two competing firms sell two differentiated products to a price- and pollution-sensitive market. We first discuss the target level of greenness that can improve the environmental quality and then design the appropriate subsidy rate. We show that the government subsidy can decrease the selling price, increase the market share and the profit from greener products, and positively affect EQ. Contrary to some findings in the literature, we find that a higher subsidy rate may not always simultaneously benefit the environment, social welfare, and social surplus. Finally, we validate our structural results with various numerical examples and sensitivity analyses.

Mosanna, Z., Heydari, J., Torabi, S. A., & **Ülkü, M. A.** (2022). Donating to a good cause: Optimal coordination design of a dyadic supply chain with socially aware consumers. *Computers and Industrial Engineering*, 169. <https://doi.org/10.1016/j.cie.2022.10824>

Socially aware consumers care about giving to a good cause through their purchases. In reality, though, while some consumers respond favourably to companies' social responsibility initiatives, others apprehend because they do not trust the company or the effectiveness of the cause. That variability in consumers' perceptions and purchase decisions inevitably adds to demand uncertainty. This paper studies the optimal design of a coordination mechanism for a socially responsible dyadic supply chain (SC) with a manufacturer supporting a cause-related marketing campaign (CMC) and a retailer selling to socially aware consumers. Unlike in pertinent literature, we take demand as uncertain due to consumers' diverse and unpredictable responses to announced CMC. In a Stackelberg game setting, we determine the optimal donation size (a percentage of the selling price) for the manufacturer and the retailer's optimal order size. We show that a two-part tariff (TPT) contract coordinates the SC. The numerical experiments demonstrate that the proposed TPT contract incentivizes the manufacturer to reach out to socially aware consumers by pledging to a charity. We also show that the proposed coordination model can achieve a Pareto-improving solution.

Tiller, S. J., Rhindress, A. P., Oguntola, I. O., **Ülkü, M. A.**, Williams, K. A., & Sundararajan, B. (2022). Exploring the Impact of Climate Change on Arctic Shipping through the Lenses of Quadruple Bottom Line and Sustainable Development Goals. *Sustainability (Switzerland)*, 14(4). <https://doi.org/10.3390/su14042193>

Climate change is everywhere, and the Arctic is no exception. The melting sea ice has caused renewed interest in expanding maritime shipping for potentially more accessible ocean routes. Canada emerges as a natural land bridge for trade between Asia, Europe, and the Americas. Plausibly, it is not a choice but an imperative to properly integrate the stakeholders (the environment, countries, remote communities, industrial partners) in opening the Arctic Circle to the global economy while considering the challenges. Keeping sustainability front and center and drawing on the extant literature and government policies, this interdisciplinary study offers a Canadian perspective on Arctic transportation routes over tribal lands and their quadruple bottom line (QBL) impacts on the environment, economy, society, and Indigenous cultures. Unlike the arguable premise that new transport corridors will increase trade traffic and enhance the economy in Northern Canada, the QBL approach enables a more holistic and realistic strategy for the Arctic region's sustainable development regarding regional economies, rural logistics, supply chain efficiency, and social licensing. Drawing on an integrative literature review as methodology, we highlight the QBL framework and the United Nations Sustainable Development Goals as crucial policy tools. Such a holistic perspective helps stakeholders and decision makers frame better policies in identifying, assessing, adapting, and mitigating risks for transportation infrastructure exposed to climate change. We recap the impacts of Arctic Shipping (ArSh) on QBL pillars in an interaction matrix and emphasize that while ArSh may be complementary to economic development, it poses threats to the viability of the Indigenous cultures.

Worku, A., & **Ülkü, M. A.** (2022). Analyzing the impact of the COVID-19 pandemic on vegetable market supply in Northwestern Ethiopia. *Journal of Agribusiness in Developing and Emerging Economies*, 12(3), 371–385. <https://doi.org/10.1108/JADEE-06-2021-0147>

: Purpose: Due to global trade and transportation, the COVID-19 pandemic has rapidly reached all corners of the world; it has most impacted the poor communities and rural areas with limited or no access to recovery. This paper aims to understand the pandemic's impact on the market supply of vegetables (agrifood) in Ethiopia and other countries in sub-Saharan Africa and to implement scientifically based recommendations that can improve the challenges caused by the pandemic and

improve the livelihoods of vegetable producers. Design/methodology/approach: This study assessed the major incidents that follow the occurrence of the COVID-19 pandemic in Ethiopia with the factors that significantly influence onion market supply in the Mecha district of Northwestern Ethiopia using linear multiple regression. Findings: The study revealed that producers, processors, local collectors, cooperatives, wholesalers, retailers and consumers are the main actors. The most important difference that happened on the onion market channel after the outbreak of coronavirus was brokers were removed from the market channel after the pandemic and this saved the cost producers pay as a commission. The pandemic disrupted input distribution, extension and cooperative services and created labor scarcity. Access to market, postharvest value addition, price and marketing contract were significant factors that influence the market supply of onion. The study identified the need for policy interventions by the government to overcome the postpandemic challenges and ensure the sustainable development of onion production and marketing in the Mecha district. Research limitations/implications: The limitations of the study are primarily related to the methodology as data are collected at a single moment in time. However, the study observes that those changes after the pandemic are better understood if we collect data at different time. Therefore, the future study needs to provide longitudinal data to examine stability of response and to observe performance of the market that occur over time. Originality/value: This original research is the first to study the impacts of the COVID-19 pandemic in Northwestern Ethiopia. The data used in the analysis are primary.

Walker, Tony

Adib, D., Mafigholami, R., Tabeshkia, H., & **Walker, T. R.** (2022). Optimization of polypropylene microplastics removal using conventional coagulants in drinking water treatment plants via response surface methodology. *Journal of Environmental Health Science and Engineering*, 20(1), 565–577. <https://doi.org/10.1007/s40201-022-00803-4>

Background and purpose: The ubiquitous presence of microplastics (MPs) in aquatic environments has been studied widely. Due to toxicological impacts of MPs and associated contaminants, it is crucial to understand the performance of MPs removal in drinking water treatment plants (DWTPs). Few studies have investigated removal characteristics of MPs via coagulation/flocculation processes, yet removal characterization of polypropylene microplastics (PPMPs) in this process is poorly understood. This study aims to optimize coagulation of virgin PPMPs in conventional DWTPs. Methods: In this study, samples were synthesized through response surface methodology (RSM), polyaluminium chloride (PACl) was applied as a conventional coagulant to remove PPMPs in the coagulation/flocculation process, which has the least density among common polymers and is one of the most abundant manufactured polymers worldwide. A particle size analyzer (PSA) was used to measure floc size at different pH levels. Additionally, a zeta potential analyzer was used to measure stability of the flocs at different pH. Results: Base on the experimental range in Design-Expert, results revealed that the optimum removal rate was predicted to be at pH 9, PACl concentration of 200 ppm, polyacrylamide (PAM) concentration of 21 ppm, and PPMPs size of $d < 0.25$ mm. According to the predicted optimum condition, actual and predicted removal rates were $18.00 \pm 1.43\%$ and 19.69% , respectively. Conclusion: According to this study, PACl is not capable of efficiently removing virgin PPMPs in DWTPs, thereby exposing humans to eco-toxicological impacts of PPMPs through tap water.

Al Nahian, S., Rakib, M. R. J., Haider, S. M. B., Kumar, R., **Walker, T. R.**, Khandaker, M. U., & Idris, A. M. (2022). Baseline marine litter abundance and distribution on Saint Martin Island, Bay of Bengal, Bangladesh. *Marine Pollution Bulletin*, 183. <https://doi.org/10.1016/j.marpolbul.2022.114091>

Baseline marine litter abundance and distribution on Saint Martin Island, Bay of Bengal, were assessed. Seventy-two transects (100–150 m) along 12 km of coastline were surveyed for litter

items every two weeks for two months. The most abundant items were polythene bags, food wrappers, plastic bottles/caps, straws, styrofoam, plastic cups, plastic fragments, fishing nets, clothes, and rubber buoys. Tourism, local markets, hotels, domestic waste, and fishing activities were primary sources of marine litter. According to the mean clean coast index (CCI), all transects were clean, of which 11.3 % and 14.1 % of sandy beaches and rocky shores with sandy beaches were reported dirty, respectively. Northern Saint Martin Island comprised sandy beaches (2.8 %) and was extremely dirty. In addition, plastic abundance index (PAI) analysis showed that 24 % of sites, out of 72 sites, were under “very high abundance”, 33 % were “high abundance”, 33 % showed “moderate abundance”, and 4 % were classified as “low abundance”. Establishing baseline results of marine litter abundance and distribution on Saint Martin Island may help improve island conservation and mitigation strategies (e.g., improved waste management, beach cleaning activities to raise public awareness, local government litter reduction policies, and increase local pro-environmental behavioral change).

Ammendolia, J., & **Walker, T. R.** (2022a). Citizen science: A way forward in tackling the plastic pollution crisis during and beyond the COVID-19 pandemic. *Science of the Total Environment*, 805. <https://doi.org/10.1016/j.scitotenv.2021.149957>

The COVID-19 pandemic has resulted in an unprecedented surge of production, consumption, and disposal of single-use plastics (SUPs) and personal protective equipment (PPE) by the public. This widespread use of mostly plastic items like face masks and disposable gloves has led to global reports of improper disposal of potentially infectious PPE both in our urban and natural environments. Due to international travel restrictions during the pandemic, many research programs targeted at measuring plastic pollution were halted. These disruptions to research programs have stunted the ability to assess the true quantities of SUPs and PPE being mismanaged from the waste stream into the environment. This article calls for increased citizen science participation in collecting plastic pollution data both during and post pandemic. By initiating this dialogue and raising attention to the importance and potential of citizen science data collection, data can be used to develop globally informed plastic pollution mitigation strategies.

Ammendolia, J., & **Walker, T. R.** (2022b). Global plastics treaty must be strict and binding. *Nature*, 611(7935), 236. <https://doi.org/10.1038/d41586-022-03581-z>

Letter to the editor

Baxter, L., Lucas, Z., & **Walker, T. R.** (2022). Evaluating Canada’s single-use plastic mitigation policies via brand audit and beach cleanup data to reduce plastic pollution. *Marine Pollution Bulletin*, 176. <https://doi.org/10.1016/j.marpolbul.2022.113460>

Single-use plastics (SUPs) represent a major threat to marine environments and require proactive policies to reduce consumption and mismanagement. Many SUP management strategies exist to reduce SUP use and mitigate environmental impacts, including extended producer responsibility (EPR), deposit-return schemes, SUP bans or taxes, and public outreach and education. This study analyzed brand audit and beach cleanup data in four densely populated Canadian cities (Vancouver, Toronto, Montréal, Halifax) and a remote island (Sable Island) to determine efficacy of ongoing SUP mitigation measures. Cities were found to have similar litter type proportions, and six brands were found to disproportionally contribute to Canadian SUP litter, comprising 39% of branded litter collected. Results confirm that current Canadian SUP management appears to be insufficient to address leakage of SUPs into the environment. Recommendations to strengthen SUP management strategies and mitigate plastic pollution are recommended to improve future Canadian SUP reduction policies.

Bergmann, M., Almroth, B. C., Brander, S. M., Dey, T., Green, D. S., Gundogdu, S., Krieger, A., Wagner, M., & **Walker, T. R.** (2022). A global plastic treaty must cap production. *Science*, 376(6592), 469–470. <https://doi.org/10.1126/science.abq0082>

[No abstract]

De-la-Torre, G. E., Valderrama-Herrera, M., Urizar Garfias Reyes, D. F., & **Walker, T. R.** (2022). Can oviposition on marine litter pose a threat to marine fishes? *Marine Pollution Bulletin*, 185. <https://doi.org/10.1016/j.marpolbul.2022.114375>

Marine litter colonization is widely investigated as an important pathway for the dispersal of potentially invasive species. However, this phenomenon may be impacting marine biota in other ways as well. In this viewpoint, we express our concerns regarding the potential loss of viable eggs of numerous oviparous fishes deposited on marine litter when large-scale stranding events occur. Our concerns are supported by personal observations of stranded marine litter harboring fresh and viable egg capsules (*Sympterygia* sp.) and eggs (Family: Blenniidae), as well as reports in the literature. The loss of viable eggs from oviparous fishes is widely overlooked and poorly understood. Based on these knowledge gaps, we make a call for research and propose several research priorities to understand the impact of these events.

Dey, T., Trasande, L., Altman, R., Wang, Z., Krieger, A., Bergmann, M., Allen, D., Allen, S., **Walker, T. R.**, Wagner, M., Brander, S. M., & Almroth, B. C. (2022a). Global plastic treaty should address chemicals. *Science*, 378(6622), 841–842. <https://doi.org/10.1126/science.adf5410>

[No abstract]

Dey, T., Trasande, L., Altman, R., Wang, Z., Krieger, A., Bergmann, M., Allen, D., Allen, S., **Walker, T. R.**, Wagner, M., Brander, S. M., & Almroth, B. C. (2022b). Rethink farm animal production: The 3Rs. *Science*, 378(6622), 841. <https://doi.org/10.1126/science.adf3351>

[No abstract]

Diggle, A., & **Walker, T. R.** (2022). Environmental and Economic Impacts of Mismanaged Plastics and Measures for Mitigation. *Environments - MDPI*, 9(2). <https://doi.org/10.3390/environments9020015>

The mismanagement of plastic materials has grown to become a mounting global pollution concern that is closely implicated in unsustainable production and consumption paradigms. The eco-logical, social, and economic impacts of plastic waste mismanagement are currently transboundary in nature and have necessitated numerous methods of government intervention in order to address and mitigate the globalized and multifaceted dilemmas posed by high rates and volumes of plastic waste generation. This review examines the current landscape of a plastics economy which has operated with a linear momentum, employing large quantities of primary resources and disincentivizing the functioning of a robust recycling market for collecting plastic waste and reintegrating it into the consumer market. This contextualizes an increasing plastic pollution crisis that has required global efforts to address and mitigate the ecological risks and socio-economic challenges of mismanaged plastic waste. A timeline of government interventions regarding plastic pollution is described, including numerous international, regional, and local actions to combat plastic waste, and this is followed by an examination of the relevance of the extended producer responsibility principle to improve plastic waste management and obligate industry to assume responsibility in waste collection and recycling.

Gharari, Z., Hanachi, P., Sadeghinia, H., & **Walker, T. R.** (2022). *Cichorium intybus* bio-callus synthesized silver nanoparticles: A promising antioxidant, antibacterial and anticancer compound. *International Journal of Pharmaceutics*, 625. <https://doi.org/10.1016/j.ijpharm.2022.122062>

Cichorium intybus, commonly called chicory, has been widely used as a coffee substitute. It displays a wide range of natural compounds and medicinal uses in treatment of gastrointestinal disorders. This study synthesized silver nanoparticles (Ci-AgNPs) using *C. intybus* leaf-derived callus extract to evaluate phytochemical content, antibacterial, antioxidant and anti-proliferative activities against human breast cancer cells (MDA-MB231). The optimal shape, size and stability of Ci-AgNPs was confirmed using UV-visible spectrophotometry, FESEM, EDX, XRD, DLS, Zeta potential, FTIR and sp-ICP-MS studies. The antibacterial activity of Ci-AgNPs was assessed using disk diffusion method against *Staphylococcus aureus* and *Escherichia coli*, and they displayed distinct zones of inhibition. Colorimetric phytochemical analysis of Ci-AgNPs revealed their higher total phenolic (TP) and total flavonoid (TF) content. Ci-AgNPs also indicated a high level of antioxidant activity using FRAP and DPPH assays. The Ci-AgNPs were investigated for their anticancer activities on the cancerous MDA-MB231 cells viability and apoptosis using MTT and flow cytometry, respectively. Ci-AgNPs showed dose dependent cytotoxicity against MDA-MB231 cells with IC₅₀ value of 187.6 µg/mL at 48 h through induction of apoptosis. The biocompatibility test showed that Ci-AgNPs induced neglectable cytotoxicity (lower than 3 %) toward human erythrocytes. This is the first study that reports the bio-callus mediated synthesis of silver nanoparticle using *C. intybus* callus extract which provided a promising anticancer activity against human breast cancer MDA-MB231 cells and therefore could be used as an alternative and interesting benign strategy for biosynthesis of silver nanoparticles useful in cancer therapy.

Gharari, Z., Hanachi, P., & **Walker, T. R.** (2022). Green synthesized Ag-nanoparticles using *Scutellaria multicaulis* stem extract and their selective cytotoxicity against breast cancer. *Analytical Biochemistry*, 653. <https://doi.org/10.1016/j.ab.2022.114786>

Scutellaria multicaulis is a medicinal herb which has been extensively prescribed in Iranian traditional medicine for treatment of infections, constipation, wounds, and also as medication for anxiety. To evaluate biological activities of biosynthesized silver nanoparticles (Sm-AgNPs), Sm-AgNPs were synthesized using *S. multicaulis* stem extract as capping and reducing agent. Characterization studies using UV-vis, XRD, DLS, Zeta potential, FESEM, EDX, TEM, FTIR, RAMAN and TGA assays indicated that Sm-AgNPs had optimal shape, size (~60 nm) and stability (-46.4 mV) to be used as a drug. Findings also demonstrated that Sm-AgNPs display higher Total Phenolics and Total Flavonoids Content and possesses higher antioxidant activity. HPLC-MSn analysis of constituents in the *S. multicaulis* stem extract and Sm-AgNPs-free supernatant in negative ion mode showed that flavonoids, mainly jaceidin, skullcapflavon II, wogonin, oroxylin A and dihydroxy, trimethoxyflavone from extract have contributed to the synthesis of Sm-AgNPs. Additionally, Sm-AgNPs demonstrated effective anticarcinogenic properties on MDA-MB231 cells proliferation with IC₅₀ value of 81.2 µg/mL at 48 h by inducing cell apoptosis. Overall, results confirmed the potential role of *S. multicaulis* stem extract as a potential raw material for synthesis of biologically active Sm-AgNPs, for development of new antitumor agents which could be utilized to combat breast cancer.

Golshani, R., Zafarani, G. G., Rebezov, M., Karbalaee, S., & **Walker, T. R.** (2022). Assessment of Organophosphorus Pesticide Residues in Water and Sediment Collected from the Southern Caspian Sea. *Applied Environmental Research*, 44(2), 18–31. <https://doi.org/10.35762/AER.2022.44.2.2>

Pollution of water resources by uncontrolled pesticide use is a serious health and environmental issue. In this study, concentrations of three organophosphorus pesticides (diazinon, malathion, and azinphos-methyl) in water and sediment samples from five estuaries (Sefidrud, Chalus, Babolrud, Tajan, and Gorganrud) along the Caspian Sea were investigated. Samples were collected from surface water and sediment during summer to autumn, and pesticides were analysed by gas chromatography-mass spectrometry (GC-MS). Results indicated that salinity and turbidity in Gorganrud were higher (salinity: range 2–8‰; turbidity: range 1–9%) compared to other stations.

Higher diazinon (water: 0.08 ± 0.06 , sediment: 0.04 ± 0.01), malathion (water: 0.09 ± 0.06 , sediment: 0.05 ± 0.01) and azinphos-methyl (water: 0.1 ± 0.08 , sediment: 0.06 ± 0.02) concentrations were observed in the Tajan river compared to other stations. Mean concentrations of diazinon, malathion and azinphos-methyl pesticides were higher in the summer compared to the autumn. Azinphos-methyl concentrations were higher than sediment quality guidelines (SQGs), which warrants ongoing monitoring. Our research provides insights into the presence of organophosphate pesticides (OPs) in rivers that enter into the Caspian Sea. Further work to better understand the environmental pollution of OPs in the Caspian Sea is ongoing.

Gündoğdu, S., **Walker, T. R.**, Almroth, B. C., Coffin, S., & Gwinnett, C. (2022). Editorial: Alternatives to petroleum-based plastics as a potential solution to the global plastic pollution crisis in marine environments: Do they provide sustainable solutions? *Frontiers in Marine Science*, 9. <https://doi.org/10.3389/fmars.2022.1066113>

Editorial

Hanachi, P., Gharari, Z., Sadeghinia, H., & **Walker, T. R.** (2022). Synthesis of bioactive silver nanoparticles with eco-friendly processes using *Heracleum persicum* stem extract and evaluation of their antioxidant, antibacterial, anticancer and apoptotic potential. *Journal of Molecular Structure*, 1265. <https://doi.org/10.1016/j.molstruc.2022.133325>

Heracleum persicum, commonly called Persian hogweed, is widely used as a spice in Iran. *H. persicum* comprises many natural compounds which are used in the treatment of multiple disorders. *H. persicum* stem extract was used for green synthesis of silver nanoparticles (Hp-AgNPs) and their phytochemical contents and antioxidant, and anti-proliferative activities were evaluated against human breast cancer cells (MDA-MB231) in this study. We found an optimal reaction medium consists of 5% of stem extract and 2 mM of aqueous AgNO₃ solution. Characterization studies including UV–visible spectrophotometry at a range of 300–700 nm, Field Emission Scanning Electron Microscopy (FESEM), Energy Dispersive Xray (EDX), X-ray Diffraction (XRD), Dynamic Light Scattering (DLS), Zeta potential, Fourier Transform Infrared (FTIR) and Surface-Enhanced Raman Spectroscopy (SERS) confirmed the optimal shape, size and stability of biosynthesized Hp-AgNPs. Results revealed that Hp-AgNPs contains higher TPC (Total Phenolic Content) and TFC (Total Flavonoid Content) and indicate a high level of antioxidant activity. The anticancer activity of Hp-AgNPs validated with inhibitory activity on growth of MDA-MB-231 cells. Results of Hp-AgNPs-treated MDA-MB-231 cells indicated an IC₅₀ value of 63.29 µg/mL at 48h. Results of this study provide a simple, rapid, non-toxic and eco-friendly protocol for biosynthesis of Hp-AgNPs, which could be used as an alternative approach for safe and simple synthesis of silver nanoparticles for biomedical applications.

Hanachi, P., Khoshnamvand, M., **Walker, T. R.**, & Hamidian, A. H. (2022). Nano-sized polystyrene plastics toxicity to microalgae *Chlorella vulgaris*: Toxicity mitigation using humic acid. *Aquatic Toxicology*, 245. <https://doi.org/10.1016/j.aquatox.2022.106123>

Polystyrene nanoplastics (PS-NPs) can cause toxicity in aquatic organisms, but presence of natural organic matter (NOM) may alter toxicity of PS-NPs. To better understand effects of NOM on acute toxicity of PS-NPs, humic acid (HA) as a model of NOM was added to green microalga *Chlorella vulgaris* medium in the presence of amino-functionalized polystyrene nanoplastics (PS-NH₂). Acute toxicity tests of PS-NH₂ to *C. vulgaris* biomass and chlorophyll a content showed statistical differences between media treated with different concentrations of PS-NH₂ and control groups ($p < 0.05$). HA significantly mitigated PS-NH₂ toxicity to *C. vulgaris* biomass and chlorophyll a endpoints ($p < 0.05$). Additionally, high HA concentration was more effective than low concentration (10 vs 5 mg/L), showing a greater ameliorative effect on PS-NH₂ acute toxicity ($p < 0.05$). Algae exposed to higher PS-NH₂ concentrations showed greater morphological changes (i.e., diminution

of photosynthetic pigments, reduction of algal size and formation of more cellular aggregates). Formation of high amounts of algal aggregates under influence of PS-NH₂ was presumably related to the high electrostatic tendency of these particles (with positively charged surfaces) to *C. vulgaris* polysaccharide walls (having negative charge). Formation of aggregates was significantly reduced in the presence of HA. HA with dominant negatively charged functional groups (following sorption by PS-NH₂ via reduction of PS-NH₂ zeta potential), could decrease electrostatic attraction between PS-NH₂ and algae, thereby substantially ameliorating cellular aggregation and cell size reduction.

Kitz, R., **Walker, T., Charlebois, S., & Music, J.** (2022). Food packaging during the COVID-19 pandemic: Consumer perceptions. *International Journal of Consumer Studies*, 46(2), 434–448.
<https://doi.org/10.1111/ijcs.12691>

While plastics play an important role in the safety, shelf-life, and affordability of many foods, their mismanagement as waste presents a serious environmental problem. In 2019, governments in Canada and globally were poised to take legislative action to curb the use of single-use plastics, with strong public support. However, the COVID-19 pandemic has since disrupted those initiatives as well as the public sentiment underlying them. The aim of our study is to measure changes in Canadian consumers' attitudes toward single-use plastic food packaging, from Summer 2019 to Summer 2020. The methodology relies on two, representative surveys of the Canadian population, carried out in May 2019 (n = 1,094) and in June 2020 (n = 977). Our measures explored potential impacts on consumer perceptions, driven both by new food safety concerns during the pandemic and also by increased price consciousness during a time of economic recession. We found that 55% of respondents were more concerned about food safety since COVID-19, and that 50% of respondents had become more price conscious when buying groceries. However, we found only a slight decline in motivation to reduce plastics – though with a sharper reduction among males. A stronger shift was seen in attitudes towards policy, where our results show a clear decline in support for tighter regulations or bans on single-use plastics, along with an increase in consumers' willingness to pay for biodegradable alternatives. These findings suggest a more difficult road ahead for legislative approaches, but also potential opportunities for market-based strategies and innovations in the food sector.

Lake, C. B., Song, X., Spooner, I. S., Tackley, H. A., **Walker, T. R.**, & Jamieson, R. C. (2022). Evaluating the movement of dissolved porewater species through a marine sediment 51 years after establishment of a pulp and paper effluent stabilization basin. *Canadian Geotechnical Journal*, 59(11), 1901–1918.
<https://doi.org/10.1139/cgj-2021-0563>

Over 50 years ago, a marine estuary was converted to a wastewater stabilization basin for treatment of primarily pulp and paper effluent. As a result, the basin was immediately converted to a “freshwater” environment and subsequently accumulated a thin layer of black, organic-rich sediment containing varying amounts of dioxins and furans, metals, polycyclic aromatic hydrocarbons, and petroleum hydrocarbons. Previous studies on the site have shown that the majority of this contamination in the basin appears to have been contained within this black sediment layer and not migrated to any significant extent into the original underlying marine sediments. The purpose of this study is to examine sediment porewater chemistry changes that have occurred over 51 years of operation of the stabilization basin with the intent of better understanding why contamination has been minimal into the underlying natural marine sediments. Field and laboratory testing is presented to characterize the physical, chemical, and mineralogical sediments in the basin. Porewater chemistry profiles obtained from this work are then used in combination with a one-dimensional contaminant transport model to examine the role of diffusion, sorption, and upward groundwater flux in the porewater profiles found for the sediments.

Molloy, S., Varkey, P., & **Walker, T. R.** (2022). Opportunities for single-use plastic reduction in the food service sector during COVID-19. *Sustainable Production and Consumption*, 30, 1082–1094. <https://doi.org/10.1016/j.spc.2022.01.023>

The COVID-19 pandemic caused a surge in consumption of single-use plastics (SUPs), particularly in the food service sector, due to concerns for public health and safety. To follow public health guidelines, food services have been limited to takeout service and have restricted use of personal reusable items. This study investigated opportunities to reduce increased use of SUPs in Nova Scotia food services sparked by the COVID-19 pandemic using semi-structured interviews and focus groups with stakeholders from the food service sector. Many participants had already implemented SUP reduction strategies prior to COVID-19. However, the COVID-19 pandemic forced businesses to rely on SUPs and to pause SUP reduction strategies. Obstacles to SUP reduction included operational challenges from COVID-19 restrictions, misunderstanding of local waste management systems, costs of transitioning to zero plastic waste, poorly manufactured alternatives, greenwashing, and ingrained societal convenience culture. Whilst not all SUP consumption patterns were attributed to COVID-19, these barriers prevented food retailers, waste managers and consumers from achieving zero-plastic waste goals. Food services should adopt SUP reduction strategies, including re-introducing reusables, implementing exchange programs for bulk items and takeout, providing education and awareness to staff and consumers, and sourcing sustainable SUP alternatives. SUP reduction strategies can be implemented immediately as public health officials and researchers agree reusable items can be used safely when using basic hygiene measures. Food services across Nova Scotia should adapt their operational procedures and create behaviour change to reduce SUPs.

Mora, M., **Walker, T. R.**, & Willis, R. (2022a). Multiple contaminant ecological risk evaluation in small craft harbour sediments in Nova Scotia, Canada. *Science of the Total Environment*, 834. <https://doi.org/10.1016/j.scitotenv.2022.155266>

Small craft harbours are vital for the fishing industry and have high socioeconomic and cultural importance for surrounding communities. Presence of potential contaminants of concern in small craft harbour sediments can have significant impacts in biota and humans, including fishing activities and the local economy. While single contaminant sediment concentrations may be below sediment quality guidelines, the interaction of multiple contaminants in sediments may potentially exacerbate chemical ecological risk. An ecological risk evaluation for four classes of contaminants (i.e., petroleum hydrocarbons, polychlorinated biphenyls, polycyclic aromatic hydrocarbons and metals) was conducted in 31 small craft harbours in Nova Scotia, Canada, using two approaches (i.e., mean probable effect level quotient and number and frequency of sediment quality guideline exceedances). Most small craft harbours showed a low ecological risk to marine biota, with only two small craft harbours suggesting high risk. While urgent action is not needed, monitoring is recommended for these small craft harbours to confirm that pollution is not increasing, and to potentially identify and control contamination sources.

Mora, M., **Walker, T. R.**, & Willis, R. (2022b). Spatiotemporal characterization of petroleum hydrocarbons and polychlorinated biphenyls in small craft harbour sediments in Nova Scotia, Canada. *Marine Pollution Bulletin*, 177. <https://doi.org/10.1016/j.marpolbul.2022.113524>

Previous characterization of polycyclic aromatic hydrocarbons (PAHs) and metals has been conducted in small craft harbour (SCH) sediments in Nova Scotia, Canada, but petroleum hydrocarbons (PHCs) and polychlorinated biphenyls (PCBs) have not been spatiotemporally assessed. This study characterized the distribution of over 500 PHCs and PCBs samples in 31 SCHs sediments between 2000 and 2017. Federal and regional sediment quality guidelines were used to determine exceedances. Results showed exceedances for diesel and oil resembling PHCs, expected given their longer permanence in sediments and lower volatility. However, only 7% of the

samples exceeded 500 ppm, threshold where benthic impairment is observed, showing low risk. PCBs do not pose high risk to biota since only six samples exceeded the higher effect level and 25% of them exceeded the lower effect one. Monitoring is recommended for SCHs with significant exceedances, as well as collectively assessing all contaminants characterized in SCHs.

Patra, I., Huy, D. T. N., Alsaikhan, F., Opulencia, M. J. C., Van Tuan, P., Nurmatova, K. C., Majdi, A., Shoukat, S., Yasin, G., Margiana, R., **Walker, T. R.**, & Karbalaee, S. (2022). Toxic effects on enzymatic activity, gene expression and histopathological biomarkers in organisms exposed to microplastics and nanoplastics: a review. *Environmental Sciences Europe*, 34(1). <https://doi.org/10.1186/s12302-022-00652-w>

Microplastics (MPs) and nanoplastics (NPs) have become an important global environmental issue due to their widespread contamination in the environment. This review summarizes existing literature on the effects of MPs/NPs on three important biomarkers including enzymatic activity, gene expression, and histopathology in various organisms from 2016 to 2021 and suggests a path forward for future research. Application of enzymatic activity, gene expression, and histopathology biomarkers are increasingly used in experimental toxicology studies of MPs/NPs because of their early signs of environmental stress to organisms. Between 2016 to 2021, 70% of published studies focused on aquatic organisms, compared to terrestrial organisms. Zebrafish were widely used as a model organism to study adverse impacts of MPs/NPs. Polystyrene (PS) were the most important polymer used in experimental toxicology studies of MPs/NPs. Fewer studies focused on the histopathological alterations compared to studies on enzymatic activity and gene expression of different organisms exposed to MPs/NPs. There is a growing need to better understand toxic effects of environmentally relevant concentrations of MPs/NPs on enzymatic activity, gene expression, and histopathology biomarkers of both aquatic and terrestrial organisms.

Provencher, J. F., Au, S. Y., Horn, D., Mallory, M. L., **Walker, T. R.**, Kurek, J., Frale, L. M., Weis, J. S., & Lusher, A. (2022). Animals and microplastics: Ingestion, transport, breakdown, and trophic transfer. In *Polluting Textiles: The Problem with Microfibres*. <https://doi.org/10.4324/9781003165385-4>

[No abstract]

Ragan, M., **Walker, T. R.**, & Zurba, M. (2022). A Pilot Study of Small Craft Harbors in Nova Scotia, Canada: Examining Livelihoods Associated with These Facilities. *Coastal Management*. <https://doi.org/10.1080/08920753.2023.2148851>

In Canada, small craft harbors (SCHs) are a federal government responsibility under Fisheries and Oceans Canada (DFO). SCHs are economic centers for many rural coastal communities in Canada. By studying the role of SCHs on livelihoods one can delineate their importance to the users and community. The pilot study utilized semi-structured telephone interviews to speak with 19 participants from Nova Scotia, Canada. Participants included users and harbor authorities on whether the SCH they use or manage impacts their livelihood or community. Results indicate SCHs provide an essential avenue for users and communities to support their livelihoods. However, the degree to which they were essential varies between SCHs. SCH users have sufficient capital assets (financial, natural, human, social, and physical) to use the facilities. However, several participants indicated they lack funds from the federal government to maintain their SCHs. Therefore, two critical hindrances in supporting prosperous livelihoods were funding from the federal government and SCHs that lack access to a harbor authority.

Rakib, M. R. J., Ertaş, A., **Walker, T. R.**, Rule, M. J., Khandaker, M. U., & Idris, A. M. (2022). Macro marine litter survey of sandy beaches along the Cox's Bazar Coast of Bay of Bengal, Bangladesh: Land-based sources of solid litter pollution. *Marine Pollution Bulletin*, 174. <https://doi.org/10.1016/j.marpolbul.2021.113246>

Macro-sized marine litter (>2.5 cm) was collected, characterized, and enumerated along the Cox's Bazar Coast, Bangladesh. Marine litter abundance was converted to density (number of items/m²). Beach cleanliness was evaluated using the clean-coast index (CCI). Plastic polythene bags were the most abundant litter items, followed by plastic cups. Total marine litter abundance was 54,401 ± 184 items. Major sources of marine litter were from tourism, fishery and residential activities. Of 10 sites surveyed, two were classified as dirty, two were moderate, four were clean and two were very clean using the CCI. Marine litter pollution along the Cox's Bazar Coast represents a potential threat to coastal and marine environments. This baseline study will help to establish mitigation strategies that are urgently required to reduce marine litter pollution along the Cox's Bazar Coast.

Rector, M. E., Filgueira, R., Bailey, M., **Walker, T. R.**, & Grant, J. (2022). Sustainability outcomes of aquaculture eco-certification: Challenges and opportunities. *Reviews in Aquaculture*. <https://doi.org/10.1111/raq.12763>

Both the aquaculture industry and eco-certification of aquaculture have grown significantly over the past 20 years, but the extent to which aquaculture eco-certification is effective in creating positive environmental and societal outcomes is uncertain. Therefore, a scoping review of research on the effectiveness of eco-certification in improving aquaculture sustainability outcomes, based on systematic search and inclusion criteria, was conducted. Challenges in producing sustainability outcomes through eco-certification were identified, including (1) choosing which components of sustainability to reflect in eco-certification criteria, (2) the risk of limiting improvements in sustainability by labelling a product 'sustainable', (3) accounting for different spatial scales of aquaculture effects, and (4) designing and applying sustainability criteria that work across different local environments. Potential approaches to these challenges include applying an ecosystem services framework to the identification of issues that could be addressed by eco-certification criteria, supporting continuous improvement of industry best practices, incorporating criteria related to the far-field effects of aquaculture, and recognising and accounting for the impact of local conditions on farming and eco-certification. Although alternate governance approaches may be better suited to ensuring improved sustainability outcomes, potential improvements to eco-certification criteria and processes are presented as opportunities to match the effectiveness of eco-certification in creating positive sustainability outcomes to its success in creating a market for eco-certified farmed seafood. However, some of these improvements may require the addition of criteria or complexity within the eco-certification process, and their impact on market outcomes, particularly the participation of producers, should be considered.

Van Leeuwen, J., **Walker, T. R.**, & Vince, J. (2022). Plastic pollution: The challenges of uncertainty and multiplicity in global marine governance. In *Routledge Handbook of Marine Governance and Global Environmental Change*. <https://doi.org/10.4324/9781315149745-27>

[No abstract]

Walker, T. R. (2022). Calling for a decision to launch negotiations on a new global agreement on plastic pollution at UNEA5.2. *Marine Pollution Bulletin*, 176. <https://doi.org/10.1016/j.marpolbul.2022.113447>

[No abstract]

Walker, T. R., Wang, L., Horton, A., & Xu, E. G. (2022). Micro(nano)plastic toxicity and health effects: Special issue guest editorial. *Environment International*, 170. <https://doi.org/10.1016/j.envint.2022.107626>

Editorial

Wang, H., Chen, Z., **Walker, T. R.**, Wang, Y., Luo, Q., Wu, H., & Wang, X. (2022). Characterization, source apportionment and risk assessment of PAHs in urban surface dust in Shenyang city, China.

Environmental Geochemistry and Health, 44(10), 3639–3654. <https://doi.org/10.1007/s10653-021-01134-3>

Characteristics, profile composition, ecological and human health risk of polycyclic aromatic hydrocarbons in surface dust collected from Shenyang city, China, were investigated. Concentrations of 16 USEPA priority PAHs ranged between 371.57 and 3300.04 $\mu\text{g/kg}$ (mean $1244.76 \pm 715.25 \mu\text{g/kg}$). Fluoranthene was the most abundant individual PAHs, followed by pyrene, and high molecular weight PAHs, more than three times of low molecular weight PAHs, were the predominant components. Profiles of PAHs showed that 4-ring PAHs were dominant, followed by 3-ring and 5-ring PAHs, and indicated that combustion sources accounted for the most PAHs. Results of diagnostic ratios and positive matrix factorization all suggested that pyrogenic sources were the most important source of PAHs in urban dust, followed by natural gas combustion and petrogenic sources, and traffic emissions would play an increasingly critical role with the increasing of vehicles. Health risk assessment suggested children were the most vulnerable to PAHs compared to adolescents and adults. Ingestion was the most important exposure pathway. The total lifetime cancer risk of 43.33% of sampling sites was higher than 10^{-6} , but the TLCR at all sites was much lower than the highest acceptable risk established by USEPA (10^{-4}).

Wang, H., Yang, Y., **Walker, T. R.**, Wang, Y., Wu, H., Wang, X., & Luo, Q. (2022). Characterization, source apportionment, and risk assessment of polycyclic aromatic hydrocarbons (PAHs) in urban soils from 23 cities in China. *Environmental Science and Pollution Research*, 29(48), 73401–73413. <https://doi.org/10.1007/s11356-022-21025-z>

Concentrations, composition profiles, sources, and health risks of 16 USEPA priority polycyclic aromatic hydrocarbons (PAHs) in urban soils from 23 cities across China based on metadata collected from previous studies between 2005 and 2021 were investigated. ΣPAH concentrations in urban soils from 23 cities across China ranged from 0.1231 to 17.2000 mg/kg (mean = $2.7171 \pm 3.8276 \text{ mg/kg}$). Overall PAH contamination in urban soils across China was moderate compared to that in global cities. Based on energy consumption and climate conditions, the spatial distributions of mean ΣPAH concentrations in Northeast China were highest, followed by those in North China, West China, East China, and South China. Individual PAH composition profiles decreased in the order: 4-ring PAHs (41.36%) > 5-ring PAHs (21.77%) > 3-ring PAHs (18.53%) > 6-ring PAHs (14.00%) > 2-ring PAHs (2.27%). Diagnostic ratios and positive matrix factorization (PMF) revealed that PAHs in urban soils were mainly derived from fossil fuel combustion (from coal, natural gas, and biomass), especially in North, Northeast, and East China, with smaller contributions from petrogenic sources. Health risk assessment results suggest that although there are potential cancer risks from PAHs, risks were acceptable. Toxic equivalent concentration (TEQ) and the corresponding oral cancer slope factor (CFS0) contributed most to the uncertainty of total risks. This study will help develop strategies to reduce PAH risk management in urban soils in China.

Zafarani, G. G., Karbalaee, S., Golshani, R., Pustokhina, I., & **Walker, T. R.** (2022). Baseline occurrence, distribution and sources of PAHs, TPH, and OCPs in surface sediments in Gorgan Bay, Iran. *Marine Pollution Bulletin*, 175. <https://doi.org/10.1016/j.marpolbul.2022.113346>

Baseline polycyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH) and organochlorine pesticides (OCPs) in surface sediments were measured in Gorgan Bay, Iran. Total PAHs, TPH, and OCPs concentrations ranged between 13.70 and 23.68 ng g^{-1} , 2.97 to 11.51 $\mu\text{g g}^{-1}$ dry weight, and below detection to 1.41 ng g^{-1} , respectively. Benzo [k] fluoranthene and anthracene had the highest (BkF; $19.77 \pm 0.08 \text{ ng g}^{-1}$), and lowest (Ant; $4.38 \pm 1.72 \text{ ng g}^{-1}$) individual PAH concentrations, respectively. The most abundant OCPs were β -Endosulfan, followed by methoxychlor and endrin. PAH isomeric ratios in sediments revealed that contamination originated from mixed sources, with a strong indication of pyrogenic sources. Ecological risk assessments

based on sediment quality guidelines (SQGs) suggested that individual PAHs and OCPs posed low ecological risks in Gorgan Bay.

Westwood, Alana

Antwi, E., Boakye-Danquah, J., Owusu-Banahene, W., Webster, K., Dabros, A., Wiebe, P., Mayor, S., **Westwood, A.**, Mansuy, N., Setiawati, M., Yohuno, P., Venier, L., Emilson, E., Adu Kwaku, I., Kosuta, S., Kwabena Sarfo, A. (2022). A global review of cumulative effects assessments of disturbances on forest ecosystems. *Journal of Environmental Management*, 317: 115277. <https://doi.org/10.1016/j.jenvman.2022.115277>

This paper reviews trends in the academic literature on cumulative effects assessment (CEA) of disturbance on forest ecosystems to advance research in the broader context of impact assessments. Disturbance is any distinct spatiotemporal event that disrupts the structure and composition of an ecosystem affecting resource availability. We developed a Python package to automate search term selection, write search strategies, reduce bias and improve the efficient and effective selection of articles from academic databases and grey literature. We identified 148 peer-reviewed literature published between 1986 and 2022 and conducted an inductive and deductive thematic analysis of the results. Our findings revealed that CEA studies are concentrated in the global north, with most publications from authors affiliated with government agencies in the USA and Canada. Methodological and analytical approaches are less interdisciplinary but mainly quantitative and expert-driven, involving modeling the impacts of disturbances on biophysical valued components. Furthermore, the assessment of socioeconomic valued components, including the effects of disturbance on Indigenous wellbeing connected to forests, has received less attention. Even though there is a high preference for regional assessment, challenges with data access, quality, and analysis, especially baseline data over long periods, are hampering effective CEA. Few articles examined CEA – policy/management nexus. Of the few studies, challenges such as the inadequate implementation of CEA mitigation strategies due to policy drawbacks and resource constraints, the high cost of monitoring multiple indicators, and poor connections between scenarios/modeling and management actions were paramount. Future CEA research is needed to broaden our understanding of how multiple disturbance affects forests in the global south and coupled social and ecological systems and their implications for sustainable forest management.

Collison, B. R., Reid, P. A., Dvorski, H., Lopez, M. J., **Westwood, A. R.**, & Skuce, N. (2022). Undermining environmental assessment laws: post-assessment amendments for mines in British Columbia, Canada, and potential impacts on water resources. *Facets*, 7, 611–638. <https://doi.org/10.1139/FACETS-2021-0106>

In British Columbia (BC), Canada, there is increased attention on mines and their impacts on water resources. In BC, many proposed mines undergo provincial environmental assessment (EA), which predicts a mine's risks and involves government oversight and public engagement. After approval, mines can apply for amendments that alter the project's undertakings, including in ways that may harm water resources. We examined all amendment documents for mines undergoing provincial EA in BC from 2002 to 2020. Of the 23 approved mines, 15 (65%) requested a total of 49 amendments, of which 98% were approved. Most mines applied for their first amendment within 3 years of approval. We deemed 20 of the approved amendments (associated with 10 projects) likely to have negative impacts on water resources, including changes to effluent discharge, increased volume of water extraction, or degradation of fish habitat. Amendment applications and approval documents lacked specific, quantitative information to reinforce claims or decisions. We present the first known summary of EA amendments in any jurisdiction. Given that most mines in BC receive amendments, and many are related to water, we express concern that amendment processes increase risk to water resources without meeting standards of evidence and public scrutiny required by the regular EA process.

Sergeant, C. J., Sexton, E. K., Moore, J. W., **Westwood, A. R.**, Nagorski, S. A., Ebersole, J. L., Chambers, D. M., O'Neal, S. L., Malison, R. L., Richard Hauer, F., McPhee, M. V., & Skuce, N. (2022). Risks of mining to salmonid-bearing watersheds. *Science Advances*, 8(26). <https://doi.org/10.1126/sciadv.abn0929>

Mining provides resources for people but can pose risks to ecosystems that support cultural keystone species. Our synthesis reviews relevant aspects of mining operations, describes the ecology of salmonid-bearing watersheds in northwestern North America, and compiles the impacts of metal and coal extraction on salmonids and their habitat. We conservatively estimate that this region encompasses nearly 4000 past producing mines, with present-day operations ranging from small placer sites to massive open-pit projects that annually mine more than 118 million metric tons of earth. Despite impact assessments that are intended to evaluate risk and inform mitigation, mines continue to harm salmonid-bearing watersheds via pathways such as toxic contaminants, stream channel burial, and flow regime alteration. To better maintain watershed processes that benefit salmonids, we highlight key windows during the mining governance life cycle for science to guide policy by more accurately accounting for stressor complexity, cumulative effects, and future environmental change.

Williams, Kent

Al Halbusi, H., Tang, T. L.-P., **Williams, K. A.**, & Ramayah, T. (2022). Do ethical leaders enhance employee ethical behaviors?: Organizational justice and ethical climate as dual mediators and leader moral attentiveness as a moderator--Evidence from Iraq's emerging market. *Asian Journal of Business Ethics*, 11(1), 105–135. <https://doi.org/10.1007/s13520-022-00143-4>

Corruption devours profits, people, and the planet. Ethical leaders promote ethical behaviors. We develop a first-stage moderated mediation theoretical model, explore the intricate relationships between ethical leadership (member rated, Time 1) and employee ethical behaviors (leader rated, Time 3), and treat ethical climate and organizational justice (member rated, Time 2) as dual mediators and leaders' moral attentiveness (leader rated, Time 3) as a moderator. We investigate leadership from two perspectives — leaders' self-evaluation of moral attentiveness and members' perceptions of ethical leadership. We theorize: These dual mediation mechanisms are more robust for high moral leaders than low moral leaders. Our three-wave data collected from multiple sources, 236 members and 98 immediate supervisors in the Republic of Iraq, support our theory. Specifically, ethical leadership robustly impacts organizational justice's intensity and magnitude, leading to high employee ethical behaviors when leaders' moral attentiveness is high than low. However, ethical leadership only influences the ethical climate's intensity but has no impact on the magnitude when leaders' moral attentiveness is high than low. Therefore, organizational justice is a more robust mediator than the ethical climate in the omnibus context of leader moral attentiveness. Our findings support Western theory and constructs, demonstrating a new theory for Muslims in Arabic's emerging markets. Individual decision-makers (subordinates) apply their values (ethical leadership) as a lens to frame their concerns in the immediate (organizational justice and ethical climate) and omnibus (leader moral attentiveness) contexts to maximize their expected utility and ultimate serenity-happiness. Ethical leadership trickles down to employee ethical behaviors, providing practical implications for improving the ethical environment, corporate social responsibility, leader-member exchange (LMX), business ethics, and economic potentials in the global competitive markets.

Hassan, M. S., al Halbusi, H., Razali, A., Ariffin, R. N. R., & **Williams, K. A.** (2022). The Swedish gamble: trust in the government and self-efficacy in the battle to combat COVID-19. *Current Psychology*. <https://doi.org/10.1007/s12144-022-02947-w>

Governments around the world have issued movement restrictions and quarantines to combat the SARS-CoV-2 (COVID-19) pandemic. However, the Swedish government has not implemented such measures but has depended on individual responsibility. The extent to which individuals have been encouraged to trust in and be satisfied with government strategies and adopt personal health measures, such as social isolation, remains unclear. This study examines the direct effects of trust in the government and risk perception on self-efficacy. Most importantly, this study intends to explore whether satisfaction with government measures strengthens the relationships between 1) trust in the government and self-efficacy and 2) risk perception and self-efficacy. We test our suggested hypotheses using survey data obtained from 403 Swedish citizens living in Sweden. As predicted, the findings indicate that trust in the government and risk perception positively impact individual self-efficacy. Additionally, the findings reveal that satisfaction with government measures strengthens these relationships; more precisely, the impact of trust in the government and risk perception under a high level of individual satisfaction with government measures is much more positive than that under a low satisfaction level. In practice, a focus on implementing successful policies and excellent individual self-efficacy is required to halt the pandemic, and the findings indicate that combining strictly attentive and adaptive individual strategies with government strategies can minimize the spread of infection.

Wranik, Dominika

Mah, C. L., Foster, K., Jago, E., Hajizadeh, M., Luongo, G., Taylor, N., Fuller, D., Yi, Y., Esan, O. T., Lukic, R., Clarke, M., **Wranik, W.D.**, Brimblecombe, J. K., & Peeters, A. (2022). Study protocol for CELLAR (COVID-related Eating Limitations and Latent dietary effects in the Atlantic Region): population-based observational study to monitor dietary intakes and purchasing during COVID-19 in four Atlantic Canadian provinces. *BMJ Open*, 12(4). <https://doi.org/10.1136/bmjopen-2022-061660>

Poor diet is a leading preventable risk for the global burden of non-communicable disease. Robust measurement is needed to determine the effect of COVID-19 on dietary intakes and consumer purchasing, given the widespread changes to consumer food environments and economic precarity. The research objectives are as follows: (1) describe dietary intakes of foods, beverages and nutrients of concern during the COVID-19 pandemic; (2) quantify change in diet during COVID-19 as compared with prepandemic, previously captured in the provincial samples of the population-representative 2015 Canadian Community Health Survey-Nutrition and (3) examine how household purchasing practices predict dietary intakes during COVID-19. Methods and analyses Observational study of diet, using a population-based stratified probability sampling strategy allocated via dual-frame (landline and cellphone) calls to random-digit dialled numbers, followed by age-sex group quotas. The base population comprises the four provinces of the Atlantic region of Canada, jurisdictions with an excess burden of pre-existing dietary risk, compared with the rest of Canada. Our aim is n=1000 to obtain reliable estimates at a regional level to describe intakes and compare with prepandemic baseline. Data collection entails 12 weeks participation: (1) enrolment with sociodemographics (key dietary risk predictors such as age, sex, gender, pre-COVID-19 income, employment, household composition, receipt of economic relief, rural residence); (2) two 24-hour diet recalls using the online ASA-24 Canada 2018 tool; and (3) online uploads of household food purchase receipts over the 12 weeks enrolled. Participation incentives will be offered. Ethics and dissemination This research protocol received funding from the Canadian Institutes of Health Research (FRN VR5 172691) and ethics review approval from the Dalhousie University Research Ethics Board. Study protocol and instruments and a de-identified dataset will be made publicly available. We will submit the findings to peer-reviewed journals, as well as conferences geared towards scientific and decision-maker audiences.

Yu, Bo

Alfano, S., **Yu, B.**, Kersten, G. E., Neumann, D., & Akpinar, N.-J. (2022). Setting the Right Tone: The Role of Language Sentiment in E-negotiations. In *Studies in Systems, Decision and Control* (Vol. 392). https://doi.org/10.1007/978-3-030-84997-9_9

E-negotiations play an integral role in interconnected global markets. Previous research has studied in great detail various aspects of social interaction in e-negotiations, including the linguistic features of messages exchanged. However, insights on the importance of language dynamics are scarce. Thus, we evaluate the role of the language tone (i.e., sentiment) in messages on outcomes in bilateral e-negotiations. Our study uses the messages extracted from 1,092 bilateral e-negotiations of the Inspire experiment. Our results suggest positive language is helpful in achieving an agreement. Avoiding negative language is a stronger driver of agreement value than increased levels of positive language. Intriguingly, successful e-negotiations exhibit a more positive sentiment during the opening, relationship-building stage, and a reduced utilization of both positive and negative words during the core e-negotiation phase. Our findings suggest that interpersonal skills, such as a careful language choice, remain crucial despite the more transactional nature of e-negotiations.

Yu, B., Kersten, G. E., & Vahidov, R. (2022). An experimental examination of credible information disclosure, perception of fairness, and intention to do business in online multi-bilateral negotiations. *Electronic Markets*, 32(1), 217–237. <https://doi.org/10.1007/s12525-021-00473-4>

Inter-firm negotiations are often non-discrete: they are not isolated exchange episodes, but part of an ongoing process of building strategic relationships between the firms. This view posits a challenge to the design and application of negotiation mechanisms in e-markets supporting business-to-business exchanges. The assessment of the mechanisms needs to include both the impacts within each discrete exchange episode and those shaping the future of the inter-firm relationships. We argue that strategies of information revelation implemented with negotiation mechanisms can influence participants' fairness perceptions, which can further affect business relationships. The paper examines both substantive and subjective measures in an experiment involving two multi-bilateral negotiations with distinct information disclosure strategies. The results show that the revelation of the best offer affects participants' perceived fairness which, in turn, positively influences intention to do business. The findings have implications for both the design and use of negotiation mechanisms where inter-firm relationships are concerned.

Yu, B., Vahidov, R., & Kersten, G. E. (2022). Supporting Users' Utilitarian Needs for Systems in Online Negotiations. In *Studies in Systems, Decision and Control* (Vol. 392). https://doi.org/10.1007/978-3-030-84997-9_8

From users' perspective, an e-negotiation system should help them achieve their objective (e.g., an agreement) to the best possible extent. This perspective aligns well with the view of utilitarian system use that conceptualizes the system use as embedded in a process within which a user attempts to achieve an exogenous goal. Given this conceptualization, users' assessment of system use can take place in three tiers, i.e., their assessment of goal achievement, technology-interaction, and the utilitarian value of the system. These theoretical propositions were tested by conducting an experiment involving e-negotiations. The results support the proposed theoretical model. The results also showed that social psychological impacts on users of a system can influence their assessment of system use.

Zhao, Yonggan

MacLean, L., Yu, L., & **Zhao, Y.** (2022). A Generalized Entropy Approach to Portfolio Selection under a Hidden Markov Model. *Journal of Risk and Financial Management*, 15(8). <https://doi.org/10.3390/jrfm15080337>

This paper develops a dynamic portfolio selection model incorporating economic uncertainty for business cycles. It is assumed that the financial market at each point in time is defined by a hidden Markov model, which is characterized by the overall equity market returns and volatility. The risk associated with investment decisions is measured by the exponential Rényi entropy criterion, which summarizes the uncertainty in portfolio returns. Assuming asset returns are projected by a regime-switching regression model on the two market risk factors, we develop an entropy-based dynamic portfolio selection model constrained with the wealth surplus being greater than or equal to the shortfall over a target and the probability of shortfall being less than or equal to a specified level. In the empirical analysis, we use the select sector ETFs to test the asset pricing model and examine the portfolio performance. Weekly financial data from 31 December 1998 to 30 December 2018 is employed for the estimation of the hidden Markov model including the asset return parameters, while the out-of-sample period from 3 January 2019 to 30 April 2022 is used for portfolio performance testing. It is found that, under both the empirical Sharpe and return to entropy ratios, the dynamic portfolio under the proposed strategy is much improved in contrast with mean variance models.

MacLean, L., & **Zhao, Y.** (2022). Kelly investing with downside risk control in a regime-switching market. *Quantitative Finance*, 22(1), 75–94. <https://doi.org/10.1080/14697688.2021.1993617>

The optimal capital growth strategy or Kelly strategy has many desirable properties, such as maximizing the asymptotic long-run growth of capital. However, it is aggressive and can have the considerable short-run risk of losing much of the invested wealth. In this paper, we provide a method to obtain the maximum growth while staying above a specified downside wealth threshold with high probability, where shortfalls below the threshold are penalized with a convex function of shortfall. The financial market is characterized by regimes, where the dynamics of the stochastic regime process is Markovian. Within a regime, the asset prices are lognormal. With the additional model features of regimes and downside risk control, the optimal strategy has a modified Kelly format. The modification requires the assignment of weights to each regime, with the weights incorporating the risk control. The multi-asset problem is reduced to determining the regime weights and the fraction of investment capital allocated to risky assets. The estimation risk is controlled by regime switching and the decision risk is controlled by the downside threshold. The methods are applied to the problem of investing in select sector exchange-traded funds.

Zhou, Jun

Ntantamis, C., & **Zhou, J.** (2022). Corporate payout, cash holdings, and the COVID-19 crisis: Evidence from the G-7 countries. *Finance Research Letters*, 50. <https://doi.org/10.1016/j.frl.2022.103275>

This paper examines the impact of the COVID-19 pandemic on the adjustments of dividends and share repurchases of publicly listed firms in the G-7 countries. Firms in the United Kingdom, Germany, France, and Italy experienced a widespread cut in dividends, while firms in the United States and Canada cut cash payout more via share repurchases, with Japanese firms in between. Corporate cash holdings helped mitigate the negative impact of COVID on payout adjustments, but the impact was less significant for European firms.

Zurba, Melanie

Bullock, R. C. L., Diduck, A., Luedee, J., & **Zurba, M.** (2022). Integrating Social Learning, Adaptive Capacity and Climate Adaptation for Regional Scale Analysis: A Conceptual Framework. *Environmental Management*, 69(6), 1217–1230. <https://doi.org/10.1007/s00267-022-01630-x>

The impact of climate-related changes on northern Canada's renewable resource sectors makes bolstering adaptive capacity an urgent imperative throughout the region. Although social learning is a key ingredient of adaptive capacity, our understanding of the relationships among social learning, adaptive capacity, and climate change adaptation is limited. Building on previous conceptual and empirical studies, this paper develops a framework that clarifies the interactions among social learning, adaptive capacity and climate change adaptation pertinent to a regional scale of analysis. The framework is multi-layered and consists of different levels of governing variables, units of analysis, learning outcomes and climate change adaptations. It is also integrative in that it encompasses social learning motivations, context and process factors, and outcomes, along with key determinants of adaptive capacity. A post hoc assessment of two climate change disturbances in northern boreal resource systems reveals the applicability of the framework to a regional scale analysis.

Zurba, M. (2022). Boundary work as a concept and practice in human geography. *Journal of Cultural Geography*, 39(1), 1–7. <https://doi.org/10.1080/08873631.2021.2011684>

[No abstract]

Zurba, M., Land, G., Bullock, R., & Graham, B. (2022). Exploring Indigenization and decolonization in cross-cultural education through collaborative land-based boundary education. *Journal of Cultural Geography*, 39(1), 8–31. <https://doi.org/10.1080/08873631.2021.1999007>

This article considers the potential for collaboratively produced boundary education as an advancement of the boundary work concept in academia. The boundary work process aims to support collaboration that works around social, cultural, political, epistemological, and other forms of boundaries. We explore how education can act as a boundary object through the development and implementation of a pilot project for land-based educational programming offered through a university. In particular, we share observations arising through a land-based education initiative that engaged Indigenous land stewards from Wabaseemoong Independent Nation and students from The University of Winnipeg. Our approach is grounded in an extended conceptual framework and process for conducting boundary work in the context of collaborative educational design and implementation involving educators from academia and Indigenous community partners. The pilot project provided baseline insights for future boundary education collaborations and provided some direction for future work.

Zurba, M., Petriello, M. A., Madge, C., McCarney, P., Bishop, B., McBeth, S., Denniston, M., Bodwitch, H., & Bailey, M. (2022b). Learning from knowledge co-production research and practice in the twenty-first century: global lessons and what they mean for collaborative research in Nunatsiavut. *Sustainability Science*, 17(2), 449–467. <https://doi.org/10.1007/s11625-021-00996-x>

An increasing need for novel approaches to knowledge co-production that effectively and equitably address sustainability challenges has arisen in the twenty-first century. Calls for more representative and contextual co-production strategies have come from Indigenous communities, scientific research forums, and global environmental governance networks. Despite calls to action, there are no systematic reviews that derive lessons from knowledge co-production scholarship to interpret their significance through the lens of a specific sociopolitical and cultural context. We conducted a systematic review of peer-reviewed and grey literature on knowledge co-production published from 2000 to 2020. Using a hybrid inductive and deductive thematic analysis, we

identified two conceptual themes — guiding principles and approaches — to structure the synthesis and interpretation of 102 studies. We found that knowledge co-production studies often converged on four interrelated principles: recognition of contextual diversity bounding knowledge co-production, preemptive and intentional engagement with Indigenous knowledge holders, formation of shared understanding of the purpose of knowledge co-production, and empowerment of knowledge holders throughout the co-production cycle. These principles manifested in multiple approaches for interpreting, bridging, applying, and distributing power amongst diverse knowledge systems rooted in different epistemologies. We filter these findings through the social-ecological context that frames an ongoing knowledge co-production project with Inuit communities in Nunatsiavut, Canada: the Sustainable Nunatsiavut Futures Project. Our review suggests that emerging forms of knowledge co-production principles and approaches yield immense potential in diverse contexts. Yet in many regions, including Nunatsiavut, principles alone may not be enough to account for systemic and contextualized issues (e.g., colonisation and data sovereignty) that can present roadblocks to equitable sustainability science in the twenty-first century if left unaddressed.