

Advocacy Coalition Impacts on Healthy Public
Policy-Oriented Learning in Alberta, Canada (2009-2016):
A Difference-in-Differences Analysis

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RESEARCH HIGHLIGHTS

- Chronic disease prevention requires policy, systems, and environmental change
- The advocacy coalition framework supports communication of change strategies
- Strategies for healthy public policy-oriented learning may shift elites' beliefs
- Surveys evaluated long-term elite versus public belief shifts in Alberta, Canada
- Evidence of elite belief shifts shows value in policy-oriented learning approaches

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ETHICAL APPROVAL

All procedures performed in studies involving human participants were in accordance with the ethical standards of the University of Alberta Human Ethics Research Board and the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans.

INFORMED CONSENT

Informed consent was obtained from all individual participants included in the study.

ABSTRACT

Since 2009, the Alberta Policy Coalition for Chronic Disease Prevention (APCCP) has pursued policy, systems, and environmental change strategies engaging policy elites to promote healthy public policy for chronic disease prevention in Alberta, Canada. Employing Advocacy Coalition Framework (ACF) vocabulary to facilitate our analysis, we examined whether concerted advocacy by the APCCP shifted elites' belief system structures over an eight year period compared to the general public as a baseline, by fostering healthy public policy-oriented learning. As data for the study, we employed a trend design series of cross-sectional Chronic Disease Prevention Surveys in Alberta, Canada between 2009 and 2016, comparing policy elite responses in 2009 ($n=183$) and 2016 ($n=174$) with general public responses in 2010 ($n=1203$) and 2016 ($n=1200$). Drawing on four scales developed in a published exploratory factor analysis, we examined changes in elite versus public beliefs with respect to (i) behavioral etiology, (ii) socio-ecological etiology, (iii) individual responsibility, and (iv) societal responsibility. Each scale was analyzed for reliability using Cohen's alpha (α), tested for sample mean (μ) value differences with analysis of variance (ANOVA) ($p<.05$), and compared between groups over time using difference-in-differences analysis. Cohen's alphas above approximately .700 indicated acceptable scale reliability ($.692 \leq \alpha \leq .879$). ANOVA testing indicated significant group mean difference for every scale but societal responsibility among elites ($\mu_{2009}=13.2$, $\mu_{2016}=13.7$; $p=.06$). Standardized beta coefficients (β) presented significant differences between elites and the public for three of four scales, excepting behavioral etiology ($\beta=-0.009$, $p=.746$). In ACF terms, transformation of elites' policy core beliefs is necessary, but not sufficient, for major policy change such as healthy public policy. Spanning provincial policy communities relevant to whole-of-government intervention for chronic disease prevention, our results provide evidence to

support the plausibility of long term socio-ecological strategies aiming to foster policy-oriented learning among elites by advocacy coalitions like the APCCP.

KEYWORDS

Canada; advocacy coalition framework; chronic disease prevention; difference-in-differences; healthy public policy

INTRODUCTION

The incidence and prevalence of many chronic diseases (including diabetes, obesity, stroke, heart and circulatory diseases, respiratory illnesses, and many cancers) present a significant portion of global burdens, and could be markedly reduced with population-level changes in modifiable risk behaviors (Beaglehole et al., 2011; World Health Organization, 2009). Unhealthy diets, infrequent physical activity, tobacco use or exposure, and high risk alcohol consumption consistently rank among the top ten behavioral risks for morbidity and mortality, worldwide (World Health Organization, 2009). Nevertheless, only a fraction of all health research and program funding is allocated to modifying behavioral risk factors for chronic disease prevention (Sullivan, Homberg, & Purushotham, 2012). Moreover, the bulk of chronic disease prevention currently focuses on delivering interventions to individuals, neglecting opportunities to pursue policy, system, and environmental change strategies to restructure political, economic, and social incentives as determinants of individual behavior (Capewell, & Capewell, 2017). Since many of the collective determinants for behavioral risk factors are beyond the mandate of formal health care systems, inter-sectoral collaboration between health departments, other government agencies, and even the private sector will be necessary for chronic disease prevention to achieve any population-level impact. This conundrum has prompted calls for European and North American public health proponents to shift their focus toward whole-of-government interventions promoting system-level healthy public policies that alter the socio-ecological environments in which risk behaviors occur (De Salvo et al., 2017; Isidean et al., 2017; Puska, 2014).

Healthy public policies (also known as *public health policy*, or simply *health policy*) (De Leeuw, 2014) are examples of whole-of-government interventions aiming to “improve the

conditions under which people live: secure, safe, adequate, and sustainable livelihoods, lifestyles, and environments, including housing, education, nutrition, information exchange, child care, transportation, and necessary community and personal social and health services” (Milio, 2000, p. 622), where governments are society’s tool for collective action on upstream determinants of health and corresponding activities. In terms of chronic disease prevention, some examples of initiatives to promote population health outside of the health care system include excise taxing unhealthy foods and beverages; sponsoring municipal by-laws and/or zoning to promote physical activity; requiring plain product design and packaging for tobacco and vaping devices, and minimum unit pricing of alcohol (Beaglehole et al., 2011; Dietz et al., 2016). From a public health perspective, prospective benefits of employing healthy public policies such as these include modifying risk behaviors at the population level (Rose, Khaw, & Marmot, 2009), longer term sustainability compared to individual clinical interventions (since the distributed expense of population-level prevention can lead to broader cost recovery in health care systems) (Beaglehole et al., 2011), and the direct and immediate application of research to improving sustainability by transforming societal practice (Colditz et al., 2002). Outside of the health sector, however, agencies tasked with mandates relevant to achieving healthy public policy (and the leadership in workplaces, schools and other key activity settings) are typically unfamiliar with population-level chronic disease prevention, or health equity approaches to ameliorating the determinants of health (Brownson, Haire-Joshu, & Luke, 2006; Kirk, Penney, & McHugh, 2010). Advocates pursuing socio-ecological change face a daunting challenge in nurturing the political will for healthy public policies, as efforts to mobilize the political support of policy elites in this area face competing ideologies, conflicting forms of evidence, and fiscal pressures that limit chronic disease prevention as a population health priority (Raphael, 2015).

Policy elites comprise both sovereign decision-makers in governments and key non-governmental stakeholders, as influential political actors invested with some official or unofficial capacity to alter the public agenda within national, subnational, regional, or organizational jurisdictions (Sabatier, 1991). Such elites play an especially important role within policy communities, because they may act as “veto players” invested with the political, financial, or legal authority to determine whether or not healthy public policies are part of the public agenda (Jenkins-Smith et al., 2014, p. 205). Despite a wealth of evidence prioritizing population-level chronic disease prevention (Dietz et al., 2016), whole-of-government approaches are potentially antithetical to certain elites’ values and beliefs, particularly those with enduring antagonism to collective societal interventions. Kahan and Braman (2006) have elaborated the concept of *cultural cognition* to characterize how a person’s values and beliefs typically preclude facts and evidence in determining support for public policy options, along a “group” spectrum from individualism to communitarianism, and a “grid” spectrum from hierarchy to egalitarianism (p. 153). People with more individualist group and hierarchical grid orientations to issues are likely to eschew government regulation, preferring to maintain the traditional distribution of societal resources, while those with more communitarian group and egalitarian grid orientations tend to support government interventions that redistribute responsibilities and opportunities (Kahan & Braman, 2006). Public opinion researchers, moreover, have argued that the belief systems of elites are characterized by greater *ideological constraint* compared to members of the general public, which is defined as philosophical consistency across political dimensions so that “one can relatively accurately predict elite views on one issue by knowing where they stand on others” (Lerner et al., 1991, p. 1). As such, policy, systems, and environmental change strategies that promote healthy public policy as a whole-of-government approach to chronic disease prevention

are necessarily limited (or bolstered) by broader belief system structures of the elites within policy communities.

Drawing on theories of policy change, the *advocacy coalition framework* (ACF) presents a promising approach to theorizing how propitious belief systems of elites are necessary (although not sufficient) for healthy public policy development. Initially developed in the 1980s and theoretically and empirically refined over subsequent decades (Sabatier, 1991; Sabatier & Jenkins-Smith, 1999), the ACF presents a number of “emblematic concepts” consisting of *policy communities*, *advocacy coalitions*, *belief systems*, and *policy-oriented learning* (Pierce et al., 2017, p. S14). *Policy communities* include the elite space of legislators, bureaucrats, appointees, lobbyists, journalists, researchers, analysts, leaders, civic actors, and others invested in various policy issues, who organize themselves into competing and opposing *advocacy coalitions* driven to translate their shared *belief systems* directly into public policy (Sabatier & Jenkins-Smith, 1999). According to the ACF, *belief systems* are composed of *deep core*, *policy core*, or *secondary aspect beliefs*, distinguished by their substantive and distributional content, and whether or not they are amenable to *policy-oriented learning*. Thus, *deep core beliefs* consist of tightly held axiomatic principles and values; *policy core beliefs* are more receptive cognitions concerning the severity of a problem, its causes, and preferred solutions; and *secondary aspect beliefs* involve instrumental preferences for achieving policy aims, most readily adjusted by new experiences and evidence. *Policy-oriented learning* by elites involves integrating natural, technical, and social scientific information to transform existing belief systems- a key pathway through which advocacy coalitions seek to attain their public policy objectives (Jenkins-Smith et al., 2014). Given the preceding conceptualization of policy change, the ACF provides a “shared research platform [of] common vocabulary to help analysts communicate across disciplines,

from different ... policy areas, and from different parts of the world” (Jenkins-Smith et al., 2014, p. 188). Although ACF scholarship has produced numerous hypotheses investigating policy change impetus beyond the “iron triangle” of American special-interest groups, legislative committees, and administrative agencies (Sabatier & Jenkins-Smith, 1999, p. 119; Jenkins-Smith et al., 2014), many studies employing the ACF in a comparative context (or outside the United States political system) represent only a partial borrowing of its concepts (Pierce et al., 2017). As Jenkins-Smith et al. (2014) have envisioned the “shared research platform,” it is the aim of such research to facilitate the inter-sectoral and inter-disciplinary communication of research findings across regions and policy contexts.

According to ACF vocabulary, the Alberta Policy Coalition for Chronic Disease Prevention (APCCP) is one advocacy coalition that has been pursuing policy, systems, and environmental change strategies to foster healthy public policy-oriented learning among elites across various policy communities in the province of Alberta, Canada for almost a decade since its establishment in 2009 (APCCP, 2018). The APCCP has three primary objectives for chronic disease prevention in Alberta: to increase policy capacity among decision makers; to provide leadership in developing, implementing, and evaluating policy activities; and to increase the acceptability of whole-of government approaches across policy communities (APCCP, 2018). In view of these objectives, the APCCP has mobilized a wide variety of guidance instruments to foster policy-oriented learning among elites “by gradually altering the concepts and assumptions of [policy community] participants”, the so-called *enlightenment function* for advocacy originally described by Weiss (1977), and adapted to the ACF (Jenkins-Smith et al., 2014, p. 203). Noting that policy-oriented learning remains a relatively understudied area of the ACF (Jenkins-Smith et al., 2014), Sabatier & Jenkins-Smith (1999) have called for more research to

examine how advocacy coalitions attempt to foster long term changes in elite belief system structures. The present research investigates the extent of healthy public policy-oriented learning among elites over an eight year period occurring alongside of the APCCP's concerted advocacy efforts in Alberta.

METHODS

Setting and Study Design

Certain political trends and shocks are unique to the political landscape in Alberta, which until recently had been often considered Canada's most conservative (and oil rich) province. Under a "one-party dominant system" of successive electoral victories by the right-wing Progressive Conservative party between 1971 and 2015, Alberta's government and the provincial energy sector (as its predominant revenue stream) were widely recognized in Canada as having developed "the capacity to shape political discourse and popular understandings of the public interest" (Patten, 2015, p. 256). This forty year trend was abruptly halted in 2015 (after a string of political scandals) when voters in Alberta elected the politically left-wing New Democratic Party to govern (as executive and legislative functions are combined in Canadian provincial governments). Given these background reverberations in the political culture of the province, difference-in-differences analysis of policy elite versus general public beliefs was considered to be an appropriate study design for this research. The two main assumptions for intervention and comparison groups using difference-in-differences as a statistical technique are (i) parallel trends and (ii) common shocks (Dimick & Ryan, 2014). As such, comparing elite versus public beliefs within Alberta was considered preferable to comparison of elites between provinces (which would potentially violate the assumptions of difference-in-differences analysis), particularly because the APCCP mandate is tightly focused on socio-ecological strategies targeting policy

elites, as opposed to promoting public education and outreach. Thus, we provide insights into shifting elite belief system structures in Alberta using difference-in-differences analysis of trend design series cross-sectional Chronic Disease Prevention Surveys administered to elites and the public between 2009 and 2016, drawing on four chronic disease belief scales from a previously published factor analysis (Nykiiforuk et al., 2014). By examining differences between these two groups across the baseline and follow-up survey time points, we present changes in elites' belief systems potentially attributable to policy-oriented learning.

Intervention

The APCCP is comprised of 17 not-for-profit groups with overlapping chronic disease prevention mandates focused on healthy eating, physical activity, tobacco control, and reducing alcohol misuse at the population level in Alberta (APCCP, 2018). Current organizational membership includes health charity non-governmental organizations, recreation activity groups, health professional and service associations, and provincial issue networks, namely, Alberta Health Services; the Alberta Public Health Association; the Alberta Recreation and Parks Association; the Alberta Centre for Active Living; provincial branches of Dietitians of Canada, Diabetes Canada, the Lung Association, the Heart and Stroke Foundation, and the Canadian Cancer Society; organizations like Ever Active Schools, Vivo for Healthier Generations, Action on Smoking and Health (ASH), Safe Healthy Active People Everywhere (SHAPE), and the Growing Food Security in Alberta Network; as well as University of Alberta School of Public Health affiliated research groups like Promoting Optimal Weights through Ecological Research (POWER), the Centre for Health and Nutrition (CHAN), and the Policy Location and Access in Community Environment (PLACE) Research Lab (APCCP, 2018)]. Since its establishment in 2009 with a one-time Population Health Innovation Intervention grant from the Alberta Cancer

Board, the APCCP has pursued policy, system, and environmental change strategies by engaging with elites to foster policy-oriented learning for whole-of-government healthy public policies. Broadly, the APCCP has pursued its objectives by coordinating local, regional, and provincial initiatives intended to establish policy precedence (Payà et al., 2017); inserting positive feedback into policy making cycles by issuing press releases and otherwise increasing media coverage of healthy public policies (Russell et al., 2016); offering webinars and workshops to promote leadership capacity building in activity settings like schools and workplaces (Alberta Urban Municipalities Association, 2016); hosting political forums and consensus conferences to deliberatively engage policy elites (Raine et al., 2013); conducting research and communicating results directly to provincial and municipal governments (Lomas, 1990), administering public opinion surveys to signal constituent support for whole-of-government approaches (Contandriopoulos, 2011); and pursuing additional avenues for knowledge translation and exchange (APCCP, 2018) (Table 1).

TABLE 1 – Timeline of Alberta Policy Coalition for Chronic Disease Prevention (APCCP) Activities Targeting Policy Elites in Alberta, Canada (2009-2016).

Year	Timeline of APCCP Activities Targeting Policy Elites
2009	— Formation of the APCCP with receipt of funding from the Alberta Cancer Board through a Population Health Innovation Intervention grant
2010	— Official APCCP launch event and media engagement ⁱ — Pre-election survey of “Healthy Schools” policy positions among provincial school trustee candidates — “Active Alberta” policy consultation submission promoting workplace environments that enable active living by employees ⁱⁱ
2011	— First international consensus conference on policy interventions to reduce childhood obesity ⁱⁱⁱ — “Policy Readiness Tool” research product released to support leadership capacity building for participation and advocacy in organizational and local chronic disease prevention policy development processes ^{iv} — Media engagement to increase coverage and positive feedback for interventions to support a culture of alcohol moderation alongside a provincial review of impaired driving legislation in Alberta ^v — Launch of provincial campaign advocating for provincial government funding to establish the Alberta Wellness Foundation ^{vi} — Provincial-level advocacy on behalf of a national federal/provincial/territorial parent engagement strategy for the elimination of unhealthy food and beverage marketing to children
2012	— Advocacy and letter writing campaign to support Bill 203 to protect children from second-hand smoke exposure in vehicles and municipal bylaws for smoke-free parks and playgrounds ^{vii} — Ongoing provincial campaign advocating funding for establishment of the Alberta Wellness Foundation ^{vi} — Provincial-level advocacy to government on behalf of a national parent engagement strategy for the Stop Marketing to Kids Coalition for elimination of unhealthy food and beverage advertising to children ^{viii}
2013	— Media engagement ⁱ campaign signaling support for a levy on sugary drinks in Alberta — Ongoing provincial campaign advocating for funding establishment of the Alberta Wellness Foundation ^{vi} — Provincial-level advocacy to government on behalf of a national parent engagement strategy for the Stop Marketing to Kids Coalition for elimination of unhealthy food and beverage advertising to children ^{viii}
2014	— Advocacy campaign to support Bill 206 prohibit the sale of flavored tobacco in Alberta ^{ix} — National consensus conference engaging provincial leadership on healthy food procurement for public facilities in Canada ^x — Ongoing provincial campaign advocating for funding establishment of the Alberta Wellness Foundation ^{vi}
2015	— Provincial budget submission ^{xi} and media engagement ⁱ for a levy on sugary drinks in Alberta — Survey and dissemination of school principals’ perceptions of school food environments to provincially advocate for nutritious meals and snacks as part of a governmental Universal School Food Strategy in Alberta ^{xii} — Launch of the Food Action in Recreation Environments (FARE) project to support healthy food and beverage options in public recreation facilities ^{xiii} — National priority-setting conference engaging provincial, territorial, and national leadership on promotion of physical activity in rural, remote, northern, and natural settings in Canada ^{xiv} — Ongoing provincial campaign advocating for funding establishment of the Alberta Wellness Foundation ^{vi}
2016	— Provincial advocacy for nutritious meals and snacks as part of a Universal School Food Strategy in Alberta ^{xv} — Media engagement ⁱ to promote Albertan support for a tax on sugary drinks in support of the national Stop Marketing to Kids Coalition ^{viii} — Release and media engagement ⁱ to signal public support for the 2015 Report Card on Healthy Food Environments for Children and Youth ^{xvi} — Release and media engagement ⁱ to signal public support for Alberta's 2016 Nutrition Report Card on Food Environments for Children and Youth ^{xvii} — National consensus conference engaging provincial, territorial, and national leadership on front-of-package, shelf, and menu labeling of foods and beverages ^{xix} — Ongoing provincial campaign advocating for funding establishment of the Alberta Wellness Foundation ^{vi}

ⁱMedia engagement consisted of press releases; newspaper, television, and radio interviews; and social media promotion; ⁱⁱThe final “Active Alberta” strategy document can be accessed at <https://www.culturetourism.alberta.ca/recreation/active-alberta/pdf/Active-Alberta-Policy.pdf>; ⁱⁱⁱThe resulting call to action published in the Journal of Public Health Policy can be accessed at <https://link.springer.com/article/10.1057%2Fjph.2013.9>; ^{iv}The “Policy Readiness Tool” can be accessed at <http://policyreadinesstool.com/>; ^vThe original media release can be accessed at the APCCP website under “Media Releases”; ^{vi}The Alberta Wellness Foundation advocacy website can be accessed at <http://www.wellnessalberta.ca/>; ^{vii}The private member’s statement on Bill 203 can be accessed at <http://www.smokefreealberta.com/latest-news/57-statement-from-raj-sherman-one-year-anniversary-of-bill-203-banning-smoking-in-cars-with-children-.html>; ^{viii}Details of the national strategy can be accessed at <http://stopmarketingtokids.ca/>; ^{ix}Government of Alberta response to Bill 206 and additional legislation to reduce children’s exposure to second-hand smoke in vehicles can be accessed at <https://www.alberta.ca/release.cfm?xID=353330C4BCA40-963A-9607-DE7502623C707CB8>; ^xRecommendations from the consensus conference can be accessed at the APCCP website under “Evidence/Consensus Conferences”; ^{xi}The budgetary submission can be accessed at the APCCP website under “Taxation of Sugar Sweetened Beverages”; ^{xii}Details of the school principals survey can be accessed at the APCCP website under “Healthy Eating/Healthy School Food”; ^{xiii}Details of the FARE project can be accessed at <http://www.apccprecproject.com/>; ^{xiv}The summary report from the priority setting conference can be accessed at the APCCP website under “Evidence/Consensus Conferences”; ^{xv}The APCCP policy brief on a Universal School Food Strategy can be accessed at the APCCP website under “Healthy Eating/Healthy School Food”; ^{xvi}The 2015 Report Card can be accessed the APCCP website under “Nutrition Report Card on the Food Environment for Children and Youth”; ^{xvii}The 2016 Report Card can be accessed at the APCCP website under “Nutrition Report Card on the Food Environment for Children and Youth”; ^{xviii}Recommendations from the consensus conference (forthcoming) will be available at the APCCP website under “Evidence/Consensus Conferences”.

Specific physical activity-focused initiatives undertaken by the APCCP include hosting consensus and priority-setting conferences on built environments and community design (Raine et al., 2012), as well as rural, remote, northern and natural settings for physical activity (APCCP, 2018); conducting research on the interprovincial diffusion of daily physical activity policies in schools (Olstad et al., 2015); publicizing events such as *International Walk to School Week*; lobbying to change bylaws prohibiting sporting equipment like hockey/basketball nets or skateboard ramps on municipal streets; and forging partnerships with the Alberta Medical Association for programmatic initiatives like *Youth Run Club* (as local initiatives with potential policy precedence and scalability) (APCCP, 2018). Healthy eating initiatives have included consensus and priority-setting conferences on restricting unhealthy food and beverage marketing to children (Raine et al., 2013), and improving the communication of nutrition information on front-of-package, shelf, and menu labelling; polling school board trustees about enforcing nutrition guidelines and restricting unhealthy food retailers around schools; long-term campaigns to tax sugar-sweetened beverages; and research and advocacy campaigns to improve the quality of food in recreational facilities (APCCP, 2018). Examples of tobacco and alcohol control initiatives include advocating for provincial legislation to ban sales of all forms of flavored

tobacco products and to prohibit smoking in vehicles where minors are present (Nykiforuk et al., 2014), as well as advocacy to local municipal authorities to remove alcohol advertising on public transportation (APCCP, 2018). The APCCP intentionally targets policy elites as a change strategy to promote whole-of-government approaches to chronic disease prevention. While the APCCP's activities may have indirectly contributed to a potential shift in public beliefs among some very engaged members of the public in Alberta, the bulk of the intervention's influence could reasonably be expected to affect mostly policy elites.

Participants and Procedures

A trend design series of cross-sectional Chronic Disease Prevention Surveys were administered to policy elites and the general public recruited in 2009 (elites; $N=183$, 14.7% response rate), 2010 (public; $N=1203$, 21.2% response rate), and 2016 (elites; $N=174$, 10.2% response rate; public $N=1200$, 8.0% response rate). Trend designs for surveys involve administering the same survey items to different respondents sampled from the same population at different time points, or “repeated cross-sections” (Jann & Hinz, 2016, p. 112). For the purposes of survey sampling, policy elites were operationalized as governmental (ie., individuals working at upper-level positions in provincial or municipal governments) and non-governmental (ie., school boards, large workplaces, or the media) respondents. A census sample frame of policy elites and their contact information was assembled at each time point using publicly-available information. Organizational websites providing contact information included the *Legislative Assembly of Alberta* (all elected members of the provincial legislature and deputy ministers), *Municipal Affairs* (all mayors, reeves, and chief administrative officers in cities, towns, municipal districts, and specialized municipalities), the *Alberta School Boards Association* (all school division superintendents and chairs), and the *Media in Alberta Directory*

(all print news media editors and health reporters based in the province). Large workplaces with more than 500 employees in Alberta were identified by advanced querying the Orbis database of private companies, and contact information was obtained by hand searching company websites (all chief executive officers, human resource executives, and health and safety executives). Potential participants received an email or hard copy letter of invitation; interested individuals provided informed consent, and completed either a paper (2009 data collection) or online (2016 data collection) survey. For the general public, a computer-assisted telephone interview (CATI) survey was administered to samples of Alberta adults, stratified by age and gender according to the Canadian Census, and with equivalent samples from each of the major cities of Edmonton and Calgary, and the remainder of the province. Potential participants were recruited with information about the Chronic Disease Prevention Survey during the course of the CATI procedures, and consent was implied by verbally completing the survey. Ethical approval for the research was obtained from the University of Alberta Human Research Ethics Board; additional information about the design and sampling approach can be found elsewhere (Nykiforuk et al., 2014).

Measures

The APCCP developed and adapted successive iterations of the Chronic Disease Prevention Survey administered from 2009 through 2016 (Nykiforuk et al., 2014), facilitating evaluation of change in belief systems, as operationalized according to the ACF. The Survey collected basic demographic information for policy elites (age, gender, sector, nature of position, and ideology) and the general public (age, gender, income, and education), permitting statistical analyses to control for potentially confounding variables. Importantly, the Survey examined respondents' views on chronic disease prevention and treatment, individual versus collective

health promotion approaches, and support for evidence-based healthy public policies, drawing on items used in previous descriptive and psychometric research (Cohen et al., 2002; Karasek et al., 1998). For the present analysis, survey items assessed two domains on the basis of a previously published exploratory analysis that produced a *chronic disease beliefs* factor with four scales (Nykiyoruk et al., 2014), using the same survey items administered at all time points (Table 2). According to the ACF, *belief systems* comprise “fundamental substantive and distributional values, perceptions of the severity and causes of policy problems, and perceptions of the proper approaches to be used in addressing these problems” (Zafonte, & Sabatier, 2004, p. 77). As such, the two domains assessed by the chronic disease beliefs factor were theorized to represent substantive and distributional dimensions of respondents’ policy core belief systems, namely, their substantive beliefs about the cause of chronic diseases (the *behavioral etiology* and *socio-ecological etiology* scales), and their distributional beliefs about the responsibility for chronic disease prevention and treatment (the *individual responsibility* and *societal responsibility* scales). The *behavioral etiology* scale (five items) assessed substantive beliefs about whether chronic diseases such as cancer are attributable to modifiable risk behaviors (ie., healthy diet, healthy body weight, regular physical activity, drinking excessive alcohol, and consuming tobacco). The *socio-ecological etiology* scale (four items) assessed substantive beliefs about whether built environments pose a collective risk (ie., where a person goes to school, works, or the neighborhood, town, or city where they live). The *individual responsibility* scale (five items) assessed distributional beliefs whether individuals are responsible for preventing chronic diseases (ie., fault/responsibility for problems with tobacco, alcohol, and obesity resting with individuals). The *societal responsibility* scale (six items) assessed distributional beliefs whether society should assume a leading role in chronic disease prevention (ie., fault or responsibility for

problems with tobacco, alcohol, and obesity belonging to society). Notably, Kahan and Braman's (2006) *cultural cognition* theory presents an analogous conceptualization of values alongside the domains represented by the chronic disease belief factor, with the hierarchy to egalitarianism "grid" orientation underscoring substantive beliefs regarding behavioural versus socio-ecological etiology, and the individualism to communitarianism "group" orientation underscoring distributional beliefs about individual versus societal responsibility.

TABLE 2 - Chronic Disease Belief Factor *Behavioral Etiology*, *Socio-Ecological Etiology*, *Individual Responsibility*, and *Societal Responsibility* Scales Comprising Chronic Disease Prevention Survey Items Administered in Alberta, Canada (2009-2016).

Behavioral Etiology

Do you agree the following are linked to cancer risk?

Eating a healthy diet, including sufficient servings of fruit and vegetables
 Maintaining a healthy body weight
 Participating in regular exercise
 Drinking excessive alcohol
 Smoking cigarettes

Socio-Ecological Etiology

Do you agree the following are linked to cancer risk?

The town or city where a person lives
 The neighborhood where a person lives
 Where a person goes to school
 Where a person works

Individual Responsibility

Do you agree when someone has a problem with:

Tobacco it is their own fault?
 Tobacco it is their responsibility to deal with it?
 Alcohol it is their own fault?
 Alcohol it is their responsibility to deal with it?
 Obesity it is their responsibility to deal with it?

Societal Responsibility

Do you agree when someone has a problem with:

Tobacco it is caused by circumstances beyond their control?
 Tobacco it is society's responsibility to deal with it?
 Alcohol it is caused by circumstance beyond their control?
 Alcohol it is society's responsibility to deal with it?
 Obesity it is caused by circumstances beyond their control?
 Obesity it is society's responsibility to deal with it?

Respondents' endorsement for each of the scale items was measured with four-point Likert-style responses assessing disagreement versus agreement (1=strongly disagree, 2=disagree, 3=agree, 4=strongly agree). The percent of responses interpolated for policy elites were 5.2% (2009) and 10.3% (2016), and the general public were 2.8% (2010) and 1.5% (2016); missing data were interpolated with a 2.5 score. Items were aggregated by summing all of the 1- to 4-point responses for each of the scales, such that a score of maximum disagreement with the scale was equivalent to the number of items multiplied by 1 (=strongly disagree), maximum agreement to the number of items multiplied by 4 (=strongly agree), and neutral (dis)agreement to the number of items by 2.5 (neither 3=agree nor 2=disagree). For each of the scales, the aggregate sum of responses to each of the items were averaged to obtain a sample mean value for the policy elite and general public groups at each time point. In terms of APCCP objectives, improved outcomes for elites' policy-oriented learning consisted of increasing sample mean values for the *behavioural etiology*, *socio-ecological etiology*, and *societal responsibility* scales, and decreasing sample mean values for the *individual responsibility* scale.

Statistical Analysis

We employed difference-in-differences analysis as our primary statistical technique to compare changes in each of the sample mean values for the scales between policy elites and the general public from baseline to follow-up survey waves. All of the statistical analyses were completed using SPSS (International Business Machines [IBM], 2015). Reliability analyses employing Cronbach's alpha (α) (Cronbach, 1951) were performed to assess internal consistency of scales over repeated survey administrations. Analysis of variance (ANOVA) testing at the $p < .05$ significance level was used to assess whether the scale means differed within either the policy elite or general public groups over time. Difference-in-differences analysis was conducted

according to the statistical model $Y = \beta_0 + \beta_1 P + \beta_2 R + \beta_3 (P * R)$, where P refers to baseline to follow-up scale differences (baseline=0, follow-up=1), R refers to the groups (public=0, elites=1), and $P * R$ reference to the interaction between baseline to follow-up scale changes per study group as the difference-in-differences term (Dimick & Ryan, 2014). The difference-in-differences analysis employed age and gender as covariates, testing at the $p < .05$ significance level to measure any differential change in chronic disease beliefs between groups.

RESULTS

Our primary results attempted to gauge the outcome of the APCCP's policy, system, and environmental change strategy of promoting healthy public policy-oriented learning among policy elites compared to the general public, using the four scales of the chronic disease beliefs factor to measure change in belief system structures. Demographically, there were an equivalent number of male and female respondents in the general public group, more males in the policy elite group, and more respondents older than 45 years of age in either group, at both time points. In the general public group, most respondents had at least some post-secondary education and a household income equal to or above \$70 000 (CAD) per year, approximating the overall population of Alberta. Most of policy elites worked in municipal authorities, large workplaces, and the provincial government; the majority were employed in a hired capacity as opposed to being appointed, elected, or volunteering. A greater proportion of policy elites reported themselves to be ideologically "somewhat conservative" at baseline, and ideologically "neutral" at follow-up, indicating a slight difference in the composition of the two samples (Table 3).

TABLE 3 - Demographics of Policy Elite and General Public Respondents to the Chronic Disease Prevention Survey in Alberta, Canada (2009-2016).

Demographics	Elites 2009 (n)%	Public 2010 (n)%	Elites 2016 (n)%	Public 2016 (n)%
Gender				
Male	(102) 57.3	(598) 49.7	(107) 70.9	(591) 49.2
Female	(76) 42.7	(605) 50.3	(44) 29.1	(609) 50.8
Age				
18-45	(30) 17.6	(485) 40.3	(15) 9.6	(390) 32.9
46+	(140) 82.4	(718) 59.7	(141) 90.4	(797) 67.1
Education				
Up to Post-Secondary	-	(336) 28.1	-	(244) 20.5
Post-Secondary	-	(859) 71.9	-	(944) 79.5
Household Income				
<\$70 000	-	(275) 30.6	-	(383) 36.6
≥\$70 000	-	(625) 69.4	-	(663) 63.4
Sector				
Provincial Government	(28) 15.8	-	(30) 19.2	-
Municipal Authority	(54) 30.5	-	(38) 24.4	-
Workplace	(30) 16.9	-	(36) 23.1	-
School Board	(39) 22.0	-	(23) 14.7	-
Media	(15) 8.5	-	(10) 6.4	-
Other	(10) 6.2	-	(19) 12.2	-
Nature of Position				
Elected	(51) 29.0	-	(39) 24.5	-
Appointed	(24) 13.6	-	(18) 11.3	-
Hired	(93) 52.8	-	(98) 61.6	-
Volunteer	(0) 0.0	-	(0) 0.0	-
Other	(8) 4.5	-	(4) 2.5	-
Ideology				
Very Liberal	(5) 2.9	-	(10) 6.4	-
Somewhat Liberal	(52) 30.4	-	(47) 29.9	-
Neutral	(8) 4.7	-	(39) 24.8	-
Somewhat Conservative	(82) 48.0	-	(50) 31.8	-
Very Conservative	(24) 14.0	-	(11) 7.0	-

Reliability analyses produced Cronbach's alpha (α) values consistently above the acceptable threshold of $\alpha=.700$ (Cronbach, 1951) for each scale, except for the *behavioral etiology* scale in the 2016 public survey ($\alpha=.692$), indicating internal consistency was present

over the trend design series of cross-sectional survey administrations (Table 4). For each of the scales and groups, ANOVA testing between years indicated significant differences except for *societal responsibility* among policy elites ($\mu_{2009}=13.2$, $\mu_{2016}=13.7$; $p=.06$). Difference-in-differences analyses indicated significant change in the *socio-ecological etiology*, *individual responsibility*, and *societal responsibility* scales measured with standardized beta coefficients (β) for policy elites compared to the general public. Although these effects may have been limited and/or potentially attributable to other factors at play within the healthy public policy community, arguably, the use of the public comparison group to address background provincial trends provides some reassurances regarding this encouraging preliminary evidence to support the APCCP's efforts to foster policy-oriented learning (Table 4).

Observed changes in the *chronic disease beliefs* factor scales are graphically depicted in Figure 1. For the *behavioral etiology* scale, all of the sample mean values exceeded the threshold for agreement ($\mu>12.5$) for belief that healthy eating, body weight, regular exercise, and tobacco and alcohol consumption are associated with chronic disease risk. These *behavioral etiology* means decreased significantly in both the policy elite ($\mu_{2009}=17.1$, $\mu_{2016}=16.2$; $p<.05$) and general public groups ($\mu_{2010}=15.5$, $\mu_{2016}=14.6$; $p<.05$), but without significant differences in the trend between the two ($\beta=-0.009$, $p=.746$). For the *socio-ecological etiology* scale, all of the sample mean values exceeded the threshold of agreement ($\mu>10.0$) that respondents believed neighborhoods, towns, cities and where a person works or goes to school are associated with chronic disease risk; however, the policy elites' sample mean significantly increased ($\mu_{2009}=10.9$, $\mu_{2016}=11.6$; $p<.05$) while the public's significantly decreased ($\mu_{2010}=11.7$, $\mu_{2016}=10.7$; $p<.05$) between the two time points. As would be expected, difference-in-differences analysis indicated significant differences in the *socio-ecological etiology* scale trend between the elite and public

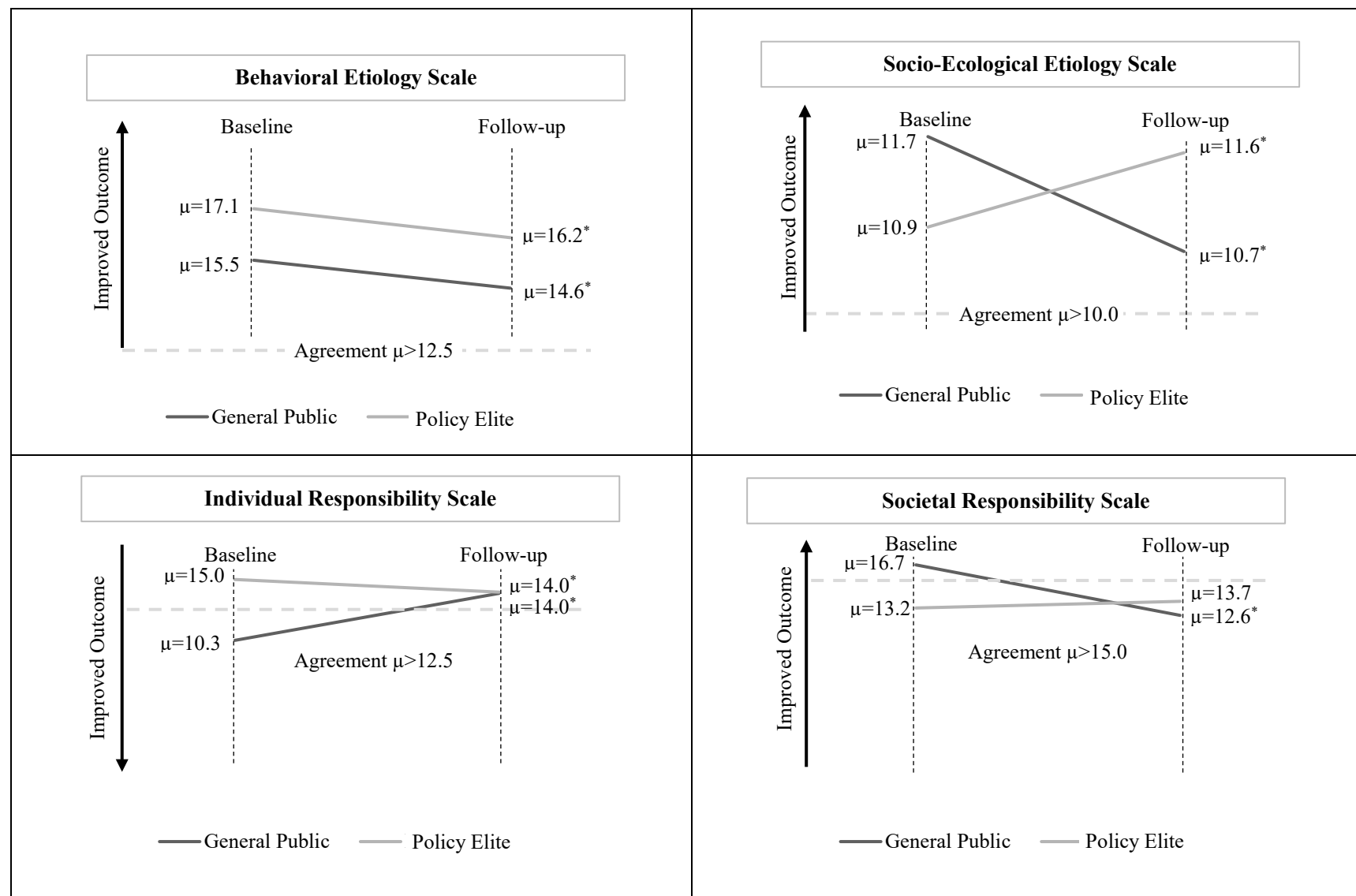
TABLE 4 - Changes in the Chronic Disease Belief Factor *Behavioral Etiology*, *Socio-Ecological Etiology*, *Individual Responsibility*, and *Societal Responsibility* Scales for Policy Elite and General Public Respondents for the Chronic Disease Prevention Survey in Alberta, Canada (2009-2016).¹

Factor Subscales	Cronbach's Alpha (α)				Unstandardized Coefficients		Standardized Coefficients Beta	Sig.	F(Reg _{df} , Res _{df})	Sig.
	Elites 2009	Public 2010	Elites 2016	Public 2016	Difference Estimator	Standard Error				
Behavioral Etiology	0.773	0.718	0.799	0.692	-0.112	0.347	-0.009	0.746	36.829(1,2701)	<0.001
Socio-Ecological Etiology	0.879	0.824	0.810	0.776	1.923	0.295	0.173	<0.001	26.914(5,2701)	<0.001
Individual Responsibility	0.833	0.715	0.805	0.766	-4.630	0.318	-0.320	<0.001	287.172(5,2701)	<0.001
Societal Responsibility	0.757	0.747	0.803	0.780	4.623	0.380	0.282	<0.001	206.978(5,2701)	<0.001

¹Internal consistency of scales according to Cronbach's alpha (α) and coefficients from difference-in-difference analysis (adjusted for age and gender)

groups ($\beta=0.173$, $p<.001$). For the *individual responsibility* scale, three of the four sample mean values (excepting the public at baseline) exceeded the threshold for agreement ($\mu>12.5$) reflecting distributional beliefs that problems with tobacco, alcohol, or obesity are the fault of individuals and their own responsibility to address. Both elites and the public equally agreed with this proposition at follow-up ($\mu=14.0$), although elite sample mean values significantly decreased ($\mu_{2009}=15.0$, $\mu_{2016}=14.0$; $p<.05$) and public sample mean values significantly increased ($\mu_{2010}=10.3$, $\mu_{2016}=14.0$; $p<.05$) over the two time points. Difference-in-differences analysis for the *individual responsibility* scale indicated significant differences for the elite versus public groups ($\beta=-0.320$, $p<.001$). For the *societal responsibility* scale, only the public sample mean value at baseline exceeded the threshold of agreement ($\mu>15.0$), indicating both groups disagreed with the distributional belief that that problems with tobacco, alcohol, or obesity are caused by circumstances beyond individual control and that these are society's responsibility to address. While public sample mean values significantly decreased ($\mu_{2009}=16.7$, $\mu_{2016}=12.6$; $p<.05$), elite sample means did not significantly change ($\mu_{2009}=13.2$, $\mu_{2016}=13.7$; $p<.05$); difference in differences analysis indicated a significant difference in the trend between these two groups ($\beta=0.282$, $p<0.001$).

FIGURE 1- Graphical Difference-in-Differences from the Chronic Disease Prevention Survey in Alberta, Canada (2009-2016).



*Indicates significant differences between years for policy elites and the general public at the $p < .05$ alpha level.

DISCUSSION

According to the ACF, transformation of policy core (and sometimes deep core) beliefs is required for major policy changes (Jenkins-Smith et al., 2014). Accordingly, our study analyzes long terms shifts in substantive and distributional belief systems concerning healthy public policy, namely prevailing concepts of disease etiology, and the responsibility for chronic disease prevention. Prior to considering the implications of our findings that policy elite sample mean values consistently shifted toward improved outcomes, we first acknowledge that a variety of interests intersect within the healthy public policy community (Contandriopoulos, 2011). In addition to policy elites possessing the political, financial, and legal means of governance, other advocacy coalitions mobilizing guidance instruments relevant to the determinants of population health include proponents like health care system professionals (doctors, nurses, and other clinical practitioners) and municipal planning organizations (professionals and community groups) unaffiliated with the APCCP, as well as so-called “unhealthy commodity industries” strategically opposing changes to the largely unregulated status quo (Moodie et al., 2013, p. 670). Such competing advocacy coalitions may have substantially influenced healthy public policy-oriented learning in Alberta over the eight year study period (although it is questionable to what extent they might have advocated for whole-of-government approaches to chronic disease prevention) presenting the need to be cautious about attributing change in elite beliefs solely to socio-ecological change strategies initiated by the APCCP.

Reflecting on the chronic disease belief scales as indicative of both policy elites’ substantive and distributional policy core beliefs presents additional considerations. Because policy elites’ belief system structures are characterized by *ideological constraint*, support for whole-of-government approaches to chronic disease prevention as a healthy public policy-

oriented learning outcome is likely to manifest across a broad range of policy development, formulation, enactment, implementation, and evaluation activities. The *behavioral* and *socio-ecological etiology* scales measure beliefs analogous to the individualism to communitarianism “group” orientation in cultural cognition theory, while the *individual* and *societal responsibility* scales provide a measurement analogous to the hierarchy to egalitarianism “grid” orientation (Kahan & Braman, 2006). Examining findings in light of Kahan and Braman’s (2006) insights may provide additional information regarding the kind of policy, systems, and environmental change strategies that advocacy coalitions seeking whole-of-government approaches to chronic disease prevention might successfully pursue. Presenting two additional examples from literature that employs the ACF at a subnational scale in the United States and Canada, we describe how the APCCP’s efforts may have contributed an enlightenment function for “group” and “grid” orientations among elites in Alberta under two broad themes, namely, *reconciling behavioral and socio-ecological etiology*, and *bolstering individual and societal responsibility*.

Reconciling Behavioral and Socio-Ecological Etiology

Empirically developed through exploratory factor analysis, the *behavioral* and *socio-ecological etiology* scales measured substantive policy core beliefs regarding individual agency versus collective activity settings as antecedents to chronic disease. It may be instructive when considering objectives for policy-oriented learning to examine trends between policy elites and the general public with respect to the two scales taken together. From an informed perspective on the agency versus structure debate, there is a great deal of interplay and feedback between individual choices and the choices presented by environments in modifying risk behaviors for the purposes of chronic disease prevention (Hooker, Carter, & Davey, 2009). According to Kahan and Braman (2006), cultural cognition inures personal perceptions of risk via “in-group/out-

group dynamics” to distinguish between the “spurious” and the “serious” (p. 155-156).

Developing messaging around healthy public policy that incorporates a wide spectrum of beliefs across both the individualism and communitarianism dimensions of the “group” orientation may present a promising approach. For instance, Payà et al. (2017) have documented the utility of advocacy coalition messaging for the promotion of “informed decision making” (p. 78) as a combined individual choice and collective action frame in the development of healthy public policy for restaurant menu calorie labelling in California. Examining the *behavioral* and *socio-ecological etiology* scales in our study, both the policy elites and the general public agreed that chronic diseases are influenced by individual and collective factors. Elites significantly decreased their agreement with *behavioral etiology* and significantly increased agreement with *socio-ecological etiology*, which presents an encouraging shift in their belief system structures, given that chronic disease prevention efforts currently skew toward individual-level behavioral interventions worldwide (Sullivan, Homberg, & Purushotham, 2012). In comparison, the public significantly decreased agreement with *behavioral* and *socio-ecological etiology*, paralleling trends in public opinion research demonstrating increasingly fatalistic beliefs about the preventability of chronic diseases in the general public, particularly cancer (Niederdeppe & Levy, 2007). In terms of the implied objectives for socio-ecological change strategies, advocacy coalitions might aim to improve understanding of the complex interplay between individual choices and the contexts in which these occur, deliberately developing the structure-agency debate as an elite ideological constraint for both politically individualist and/or communitarian policy elites.

Bolstering Individual and Societal Responsibility

Determined by exploratory factor analysis, the *individual* and *societal responsibility* scales present distributional policy core beliefs linking the attribution of chronic disease risk to solutions perceived to be appropriate. According to Kahan and Braman's (2006) cultural cognition analysis, hierarchical versus egalitarian "grid" orientations may be brought to coincide with one another respecting the question of what constitutes good governance. Whereas those with hierarchical worldviews are concerned with protecting and preserving the "competence of social and governmental elites", those with egalitarian worldviews would regulate "activities that are productive of social inequality and that legitimize unconstrained self-interest" (p. 154). Considering both the *individual* and *societal responsibility* scales as complementary to each other may help to explain the interrelation of personal empowerment and collective action approaches as objectives for healthy public policy-oriented learning. For example, Breton et al. (2008) have documented how advocacy coalitions were able to maintain policy elite support for passage of *Tobacco Act* legislation in the province of Québec, Canada by countering the economic and freedom of expression arguments of tobacco industry interests with consistent population health framing of the problem definition as a governmental concern. With respect to the *individual* and *societal responsibility* scales, policy elites maintained their agreement with the former and disagreement with the latter, while the general public shifted from disagreement to agreement on the former, and from agreement to disagreement on the latter. While the difference-in-differences analysis indicated significant differences in the trend between groups in both scales, elites appear to have only slightly changed in their policy core beliefs, as opposed to the transformation of belief system structures required by the ACF as a prerequisite to major policy change. Elites significantly decreased their agreement with *individual responsibility* and

did not significantly change for the *societal responsibility* scale, and the public increased their agreement with *individual responsibility* and decreased for the *societal responsibility* scale, indicating much work remaining to be done to promote good governance and/or institutional intervention through healthy public policy-oriented learning. Cultivating greater acceptability for *societal responsibility* to intervene for chronic disease prevention may be incrementally accomplished by extending successful interventions that represent competent governmental action (as a hierarchical value) to address other modifiable risk behaviors into new domains. In this regard, tobacco control is perhaps the most established domain in Canadian healthy public policy, for which interventions like taxation, regulation of marketing, and restrictions on public use have demonstrated success in contributing to a reduced smoking population and smoking prevalence in the Canadian context (Thomas et al., 2008). Given that the acceptability of societal intervention has not been fully established, an appropriate goal for healthy public policy-oriented learning might involve appealing to the ideological constraint of policy elites within their existing mandates of serving the public interest to promote population health.

Limitations and Directions for Future Research

In the current study, policy elites were census sampled using a trend design series of cross-sectional survey administrations, with rates of participant engagement comparable to other surveys targeting specialized professional populations (Hardigan, Succar, & Fleisher, 2012; Scott et al., 2011). Limitations of trend series cross-sectional study designs for surveys include potentially high refusal rates resulting in non-response bias if respondents differ from non-respondents in important ways; difficulty assessing temporality or causality between variables simultaneously assessed for predictive purposes; and the possibility of modal effects introduced into the data between waves conducted by telephone, on paper, or electronically (Jann & Hinz,

2016). For instance, it may be possible that elite respondents to the follow-up surveys had more exposure to APCCP efforts and participated at higher rates than non-exposed elites, although we did not collect data in this area. Importantly, our analysis presents temporal trends in the collected data, without permitting inferential interpretations based on a longitudinal, randomized design. Multiple competing advocacy coalitions limits our ability to directly attribute change in belief system structures solely to the APCCP as a venue within healthy public policy communities; nevertheless, we are confident our findings contribute a meaningful first step toward long term evaluation of policy-oriented learning as an understudied area of ACF research. Another possible avenue for exploration would be comparative evaluation work examining the extent of policy elites' attention to healthy public policy relative to other public health issues in Alberta, like preventing motor vehicle injuries, and/or responding to the opioid crisis. Given the question of whether policy-oriented learning resulted in policy change, mixed methods approaches (incorporating policy analyses as a starting point) could employ the ACF to investigate the relative contribution of belief system structure change to the enactment of specific healthy public policy cases (as opposed to the overall political climate within the province). With a view to political stabilization of the recent temporal trends and exogenous shocks in the province, forthcoming research on this topic will employ a difference-in-difference-in-differences design with survey data to be collected in Alberta and Manitoba in between 2019 and 2021, permitting further isolation of APCCP advocacy coalition impacts on elites' healthy public policy-oriented learning.

CONCLUSION

Healthy public policies are a key tool employed by governments on behalf of citizens in population-level approaches to chronic disease prevention across modifiable risk behaviors.

Informed by Sabatier and Jenkins-Smith's ACF as a theoretical orientation (and shared research platform) our study demonstrates a temporal trend from repeated cross-sectional surveys indicating that policy, systems, and environmental change strategies to foster policy-oriented learning for whole-of-government approaches by the APCCP may have contributed to change in belief system structures in Alberta, Canada. Overall, this research provides emerging evidence that an advocacy coalition like the APCCP can meaningfully shift belief system structure toward healthy public policy change within jurisdictions, yet caution is needed when interpreting these early results, recognizing the multitude of forces that collectively influence policy change. Key challenges remain for advocacy coalitions seeking to foster policy-oriented learning among elites in pursuit of healthy public policy, including conveying the complex interrelation of behavioral and socio-ecological etiology, and nurturing the political will for government and/or institutional intervention for chronic disease prevention. Despite these challenges, a nuanced understanding of policy elites' and general public's knowledge, attitudes, and beliefs relating to chronic disease prevention is invaluable, informing strategic allocation of resources and targeted prioritization of coalition activities, to best respond to emergent policy windows, and act collectively to nudge positive change.

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