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Designing Effective Policy: Evidence from a Longitudinal Study of School District Wellness Policies in Florida

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Abstract: Public policy outcomes are fundamentally shaped by the design of public policies and the organizations charged with administering them. However, few studies to date have modeled policy and administrative attributes alongside each other as determinants of policy outcomes. In this paper, we intersect public policy and public management scholarship to address this limitation. Specifically, we examine how the design of Florida public school district wellness policies and school district level characteristics link to student health outcomes between the years of 2003-2013. Our preliminary results show the significance of policy design and district attributes in shaping student wellness over the study period. We conclude our paper with a discussion of next steps for this research.

Keywords: policy design, public program outcomes, education, performance measurement

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I. Introduction

Crafting public policy is a task that affords great opportunity and challenge for policymakers. It is through policy design that policymakers identify the goals of public policies (Schneider and Ingram, 1997). Further, it is in policy design that policymakers formally grant resources and delineate how key governance functions like policy implementation, monitoring, and evaluation will be performed by specified sets of actors. A key challenge with drafting policies is doing so in a fashion that will support the successful attainment of policy goals, given inherent uncertainties in the environments in which policies are applied, and variation in resources and motivations of implementing actors (Sabatier and Mazmanian, 1980). But while policy outcomes can be logically thought of as being concertedly influenced by policy design, characteristics of implementing authorities, and features of the policy environment, scholars of public affairs have mostly limited their attention to the latter two categories of factors. Notably absent from the literature are empirical studies that examine how policy outcomes actually link to policy design.

In this paper, we intersect public policy and public management scholarship to support an assessment of how the design of policies that direct the implementation and evaluation of public programs, alongside characteristics of program implementing authorities, influences program outcomes. Specifically, in the context of school district-level wellness programs in Florida, U.S., we respond to the following two research questions: How do school districts direct wellness policy implementation and evaluation through wellness policy design? How does wellness policy design, alongside districts' structural and financial characteristics, link to student health outcomes?

School wellness policies have proliferated across the United States since the passage of the 2004 Child Nutrition and Women, Infants, and Children (WIC) Reauthorization Act. This Act requires that any school district participating in the National School Lunch Program or other federal child nutrition programs establish a local wellness policy for all schools under its jurisdiction. Requirements regarding the local school wellness policy were re-affirmed and elaborated in the 2010 Healthy, Hunger-Free Kids Act. According to the federal policies, school wellness policies should establish goals for nutrition, physical education, and other wellness related activities within schools as well as include guidelines for implementing and evaluating the policies and activities identified therein.

The state of Florida provides an appropriate setting in which to examine our research questions for several reasons. First, wellness policymaking authority is delegated to the school district level. There are 67 school districts in the state of Florida. There is substantial variation in the design of wellness policies across these districts. This cross-case variation allows us to formally investigate if and how differences in policy design variably link to health outcomes of students across districts. Florida also provides an appropriate setting for this research due to the availability of student health data, our key policy outcome measure in this research. The Florida Department of Health houses comprehensive health data for students from all 67 school districts in the state dating back to 2003. Most school districts in the state enacted their school wellness policies from 2004 onward, following the establishment of the federal requirement. The availability of student health data in Florida allows us to longitudinally

assess linkages between policy design and student health outcomes, factoring district-level characteristics.

This paper proceeds as follows. We begin with a brief overview of public management and policy scholarship on policy design, implementation, and outcomes. In this literature review, we focus on identifying factors found to significantly influence policy outcomes. Next, we describe our study context; Florida school districts and their wellness policies. Following this description, we describe our research methods and results. Among our key findings is that both policy design variables and district attributes (e.g., resources) significantly influence student wellness outcomes.

II. Literature

To inform the research reported in this paper, we draw insight from scholarship from the related fields of public policy and public management. Consistent with Birkland (2014, 203), we define policy as a statement by a public entity of what it intends to do or not to do that is embodied in the form of a law, regulation, decision, or order. Consistent with Schneider and Sidney (2009, 104), we define policy design as the content of policy. According to Schneider and Sidney, the carefully constructed content that comprises policies details critical information, such as, the goals to be pursued through public efforts, policy targets (i.e., those performing or being impacted by policy activities), the specific directives that tell policy actors what they are permitted, required, or forbidden to do under certain temporal and spatial constraints, the structure of policy implementation, and incentives for policy compliance. Each of these activities represent crucial governance functions, prompting the need to assess the structure and effects of policy design.

Existing scholarship on policy design has largely been focused on organizing policies by type based on their design (Lowi, 1964; Wilson, 1979), characterizing policies in relation to design attributes (e.g., policy instruments) (Schneider and Ingram, 1997), or systematically examining policy language relating to design attributes (Mondou and Montpetit, 2010; Siddiki, 2014). Limited in the extant literature on policy design are empirical investigations of how policy implementation by public actors is formally structured through policy design and the subsequent effects thereof on policy outcomes.

Some policy process frameworks specifically call attention to policy design. Sabatier and Mazmanian's implementation framework explicitly acknowledges the importance of policy design in shaping policy implementation and related outcomes (1980), though the framework does not provide specific guidance about how policy designs should be analyzed. The institutional analysis and development (IAD) framework (Ostrom, 2005) provides specific guidance on how the individual directives comprising institutions, of which formal government policies are an example, can be categorized into different types of rules directing institutional actors, decision making and information flows among them, and other governance functions. This coding can then be used as a basis for understanding how institutional design influences institutional implementation and outcomes. The IAD framework thus provides a useful platform for empirical studies of policy design. A great portion of IAD-based studies have focused on how institutional design shapes individual and

collective behavior, specifically in the context of resource management. Fewer IAD studies focus on systematically investigating the content of government policies (Basurto et al., 2009), and even fewer have sought to link the design of these policies with characteristics of implementing actors to understand broader policy outcomes. While not an example of the latter, Carter et al.'s (2015) study on the design of U.S. organic farming regulations offers a useful illustration of how analytical methods housed in the IAD framework can be applied to study how public policy formally structures policy implementation.

The literature reviewed hereto largely comes from public policy and political science scholarship. Another logical place to look when considering the link between policy design and policy outcomes is the public management literature; in particular, the literature focused on assessing policy or program effectiveness or performance management. A review of this literature shows that the link between policy design and performance outcomes has been largely unexplored by public management scholars. An exception is Wichowsky and Moynihan's (2008) study, which considers the link between policy design and citizenship outcomes as one measure of performance.

But while public management studies do not formally examine policy design as determinants of policy outcomes, many of the factors found therein to shape policy implementation and related outcomes are tied to the policies that direct public organizations' work. Below we highlight some of these factors.

Mission. Public organizations are engaged in purposive activities to fulfill a publicly appropriate mission. Indeed, a public agency is deemed effective when it "performs well in discharging [its] administrative and operational function pursuant to [its] mission" (Rainey and Steinbauer, 1999, 13). These missions are often identified in the policy mandates. These same policy mandates often direct the management of public organizations in support of mission attainment.

Involvement of External Actors. The extent of involvement of outsiders or number of access points to the implementation process granted to outsiders may drastically affect policy implementation and outcomes (Rainey, 2003; Sabatier and Mazmanian, 1980). On one hand, actors considered external to a public organization may be motivated by goals that conflict with those of the latter and thus their involvement may complicate policy implementation and hinder the attainment of policy goals (Pressman and Wildavsky, 1973). On the other hand, a public organization's connectivity to a diversity of stakeholders may be beneficial insofar as it can ensure that the organization doesn't become beholden to any single interest (Rainey and Steinbauer, 1999). Connectivity to a diverse array of stakeholders can also bolster the resources and legitimacy of the organization (Granovetter, 1973; Bryson et al., 2006). Both policy actors and access points are often specified in the policies governing public organizations.

Autonomy. Policy outcomes can be shaped by the degree of autonomy granted to public managers and public sector employees. Rainey and Steinbauer (1999) suggest that the ability of internal stakeholders to take part in key governance functions ensures that polices and related activities are appropriate to the organizational settings in which they are applied.

Further, they also assert that it is important for actors within public organizations to retain a higher level of autonomy to engage in important governance functions than external actors. Again, autonomy is often specified in policy design.

Oversight and Incentives. Oversight is critical in any policy governed setting. Oversight mechanisms in the context of public organizations function to facilitate the attainment of performance expectations. Incentives operate in the same way. According to Rainey and Steinbauer (1999), agencies are more effective when subject to a system of extrinsic and intrinsic rewards.

In addition to the above factors that may be determinable through policy design, public management scholars emphasize characteristics of policy implementing entities as significantly impacting policy performance. Below we highlight some of these factors.

Resources. Generally, resources are a measure of organizational capacity to carry out activities and goals. Types of resources relevant to the organizational context include human, administrative, programmatic, financial, technological, and reputational, among others (Lee and Whitford, 2012; Park and Rethemeyer, 2014; Rainey and Steinbauer, 1999). Human resources reflect an organization's personnel characteristics; including for example, both the number of employees and employees of a particular type an organization has. Financial resources can refer to organizational budgets or material financial assets, as well as authority or discretion in financial decision making (Lee and Whitford, 2012). Programmatic resources can be modeled in terms of the number of activities conducted that relate to the work or objectives of a specific program. In the context of federal agencies, Lee and Whitford (2012) study the relative influence of different types of such resources on agency performance and find that some resources matter more than others. Their research highlights the salience of resources as determinants of organizational effectiveness, as well as the importance of taking stock of the different forms of resources that organizations possess and the relative influence of such on organizational performance.

Organization Size. Organization size has also been shown to impact organizational performance. Operationally, organization size is often treated as a capacity indicator and modeled accordingly. For example, Jung (2013, p. 663) uses the number of full-time employees and budget size as measures of organization size. Organization size may best be thought of as a resource indicator when it is modeled in terms of such "supply-side" attributes. Organization size can also be measured in terms of "demand-side" attributes; for example, number of individuals served by an organization. When modeled in terms of demand-side attributes, the treatment of organization size as a capacity indicator may not be logically appropriate; that is, the effect of supply-side and demand-side attributes may differ. Supply-side attributes may enable an organization in completing its work, whereas demand-side attributes may be somewhat constraining. Because of the potentially varying impacts of organization on performance when modeled in terms of supply side versus demand side attributes, in this work we treat organization size as conceptually distinct from resources.

III. School Wellness Policies

School wellness policies have proliferated at the local level in the U.S. since the passage of the 2004 Child Nutrition and WIC Reauthorization Act. This Act required that all school districts that participate in the National School Lunch Program or other federal child nutrition programs establish a local wellness policy for all schools under their jurisdiction (Food and Nutrition Service, last modified 03/30/2016) by the 2006-2007 school year. This requirement was reinforced and expanded with the 2010 Healthy, Hunger-Free Kids Act. Specifically, the 2010 Act added new provisions to the basic policy requirement relating to implementation, evaluation, and reporting on policy progress. According to the 2010 Act (Food and Nutrition Service, last modified 09/01/2015), school wellness policies are required to:

- Include goals for nutrition promotion and education, physical activity, and other school-based activities that promote student wellness.
- Include nutrition guidelines to promote student health and reduce childhood obesity for all foods available in each school district.
- Permit parents, students, representatives of the school food authority, teachers of physical education, school health professionals, the school board, school administrators, and the general public to participate in the development, implementation, and review and update of the local wellness policy.
- Inform and update the public (including parents, students, and others in the community) about the content and implementation of local wellness policies.
- Be measured periodically on the extent to which schools are in compliance with the local wellness policy, the extent to which the local education agency's local wellness policy compares to model local school wellness policies, and the progress made in attaining the goals of the local wellness policy, and make this assessment available to the public.

Given their scope, school wellness policies are viewed as important mechanisms for promoting student wellness, preventing and reducing childhood obesity, and affirming that school meal nutritional guidelines meet the minimum federal school meal standards. Delegating policy activity to the district level allows districts to develop policies appropriate for their respective contexts; for example, with respect to student demographics.

This research evaluates the design and outcomes of school wellness policies developed and implemented by school districts in Florida. The Florida Department of Agriculture and Consumer Services is charged with maintaining a record of districts' wellness policies. Each school district annually reviews its local school wellness policy and makes findings of this review available for public input and revisions. Currently, 66 districts in Florida have a school wellness policy. There is variation in terms of when districts adopted their wellness policies as well as when and how often policies have been revised since their initial adoption. Half of the school districts adopted their wellness policies between 2004 and 2006. The remaining districts adopted their policies between 2007 and 2014.

In addition to varying in their adoption timing, policies also vary notably in design

across districts. The specific design features, along which we compared policies for this research, are described in detail in the methods section of this paper. Generally, however, we looked for variation in terms of how policies assign responsibility for policy implementation and evaluation, whether or not policies encourage external outreach in implementing school wellness initiatives, whether they offer clear goals, and if they specify incentives for policy compliance/non-compliance. As part of our policy design analysis, we were also able to determine the level of autonomy schools were granted to carry out policy activities relative to the school district.

IV. Methods

Data Collection

For this research, we relied on two forms of data: (i) secondary district and student data collected from the Florida Department of Health, School Health Program Service (hereon referred to as FDH); and (ii) data retrieved from a comprehensive coding of school district wellness policies. Below we describe the specific data that were used in this study.

District and Student Data. The FDH maintains district health data in the form of summary reports for the 67 public school districts in the state for school years 2003-2014. We collected data for all districts for years 2003-2013 on district demographics, district resources, and student health metrics. Specifically, at the district-level, we collected data from the FDH summary reports on district size (measured as student enrollment), number of health education classes per year, registered nurse to student ratio, number of health services offered per student per year, and health funding per student. According to the FDH, "health services" covers a broad range of services that are variably provided across districts, including: vision screenings, BMI screenings, individualized healthcare plans, and health education classes, among others. To generate the health funding per student variable, for every year from 2003-2013, we summed all the following funds a district received and divided the total funding amount by our district size variable (student enrollment): Department of Health School Health Funds – Florida General Revenue, Department of Health Funds – Temporary Assistance for Needy Families (TANF), Department of Health School Funds– Tobacco Lawsuit Settlement, Department of Health School Funds – Children's Health Insurance Program, Department of Health Funds – Volunteer Nurse Grants. All funding data was retrieved from FDH summary reports. Together, our district-level variables help us to capture three types of resources – programmatic, personnel, and financial.

At the student level, we collected data from the FDH summary reports on student health metrics. For this particular paper, we focus on teen birth rate; specifically, birth rate per 1,000 for teens 11 to 18 years of age. Teen birth is a critical health issue in the United States, and the rest of the world. Research indicates that teenage pregnancies are associated with numerous adverse health effects for both the mother and the infant (Markinson, 1985; Patel and Bisakha, 2012). Research also suggests that teenage child bearers are less likely to attain a diploma or GED than their classmates (Freudenberg and Ruglis, 2007; Hofferth, Reid, and Mott, 2001). While U.S. teen births have declined over the last couple of decades, the overall birth rate remains higher than that of many other developed countries (U.S. Department of

Health and Human Services, 2015).

Wellness Policy Coding. The first step in the coding exercise was to retrieve the wellness policies for all 67 Florida school districts (Florida Department of Agriculture and Consumer Services, n.d). For districts that have revised their policies one or more times, we sought to collect all versions (i.e., initial and revised versions). Because our study is longitudinal, coding all versions of districts' policies allowed us to capture change in policy design over time. While our objective was to collect and code policies for all districts, our ability to do so was limited by the availability of policy data and/or a lack of responsiveness by district personnel. For some districts, current and/or previous versions of the wellness policies are not publicly available and we were not able to reach district representatives to retrieve them. In a few cases, we were able to access current, but not previous versions of districts' wellness policies. With these data limitations, we were able to retrieve wellness policies for 49 districts; including, both initial and any subsequently revised versions.

Once we identified our sample of district wellness policies, data on wellness policy design was collected by coding wellness policies to identify how they address; policy implementation, policy evaluation and monitoring, community outreach on policy-related activities and goals, policy goals, and policy incentives. With policy implementation and policy evaluation and monitoring, our coding specifically captured the entity charged with conducting these policy activities. In both cases we coded for whether this entity was a school-level staff member, school-level administrator, school-level wellness committee, district-level wellness committee, or district or higher-level administrator. The logic of this characterization in the coding was to distinguish between personnel internal to individual schools and personnel external to individual schools. Nearly all coding was binary. The binary characterization of coded data allowed us to include policy design data into our statistical analysis which we describe in further detail in the following section.

The codes were carefully deliberated by all research team members. Those team members assigned policy coding responsibilities developed a set of coding guidelines to ensure that coding adequately aligned with policy design variables of interest and shared these with other team members. Using these guidelines, coders first collectively coded a sample of policies for coding practice. For the final coding, policies were divided among two research team members who then independently coded assigned policies.

Tables 1 and 2 provide a list of the variables considered in our analysis. Table 1 lists all of the policy design, district-level, and student-level variables we considered in our study. Table 2 provides information on how policy design variables were coded.

[Insert Tables 1 and 2 Here]

Data Analysis

We conducted a series of analyses once our data were collected. Relating to our coding exercise, we performed a test for inter-coder reliability following the completion of all coding, to ensure that independent coders on the research team were coding wellness policies consistently

based on pre-set guidelines. For the inter-coder reliability exercise, one of the coders randomly selected and coded 10 policies coded by the other research team member on all policy variables reported in Table 2. Coding agreement was sought by calculating the percentage of codes consistently coded between the two research team members. Across all variables and across all ten policies, the two research team members agreed on 88% of coded items.

We also conducted a sample bias test to ensure that our analysis results are not skewed based on our district/policy sample. Specifically, we conducted a sample bias analysis, in which we compared demographic data for districts for which we did have complete policy data (i.e., districts included from our analysis) with those of districts for which we did not (i.e., districts excluded from our analysis). One-way ANOVAs were performed to determine if included districts differ significantly from excluded districts in terms of district size and per capita spending. ANOVA results indicate that included and excluded districts differ significantly in terms of both size and per capita spending. Excluded districts are likely to be smaller and spend less per student than districts included in our analysis. These findings offer one explanation for the lack of policy data availability: smaller districts with fewer resources are less likely to establish and implement school wellness policies. Additionally, these districts may also have limited record-keeping capacity.

For the focal analysis of our study, we first calculated summary statistics on each of the variables included in our analysis. We then used panel regression models with panel corrected standard errors with first order autocorrelation (assuming that student health outcomes persist over years; that is, students health outcomes at year *t* are correlated with outcomes at *t*-1) to test for the relationship between our policy design and district-level variables and teen birth rate. Policy design variables were treated as our main explanatory variables and district-level variables were treated as controls. We estimated two models; one model without controls and one full model. The regression analysis included data for all 67 school districts; not just the 49 districts for which we have policy design data.

V. Results

Summary statistics for all variables included in our analysis are reported in Table 3. Results from our panel regression analyses are reported in Table 4. Both estimated models are significant at the .01 level. Our truncated model (without controls) has an R-squared value of 0.48 and our full model has an R-squared value of 0.49.

Our truncated and full models yield approximately consistent results in terms of variable significance, coefficient magnitude, and directionality of variable influence. We find that having an external (i.e., district) wellness committee engaged in policy evaluation and monitoring is associated with a decreased teen birth rate ($p < .01$) as does having an external administrator performing these activities ($p < .01$). Across both models, we also see that community outreach is negatively and significantly associated with teen births ($p < .10$). In the full model we see that district size is negatively and significantly associated with teen births ($p < .01$). Nonintuitively, we see in the full model that teen birth rate is positively and significantly associated with the specification of health and safety goals in wellness policies. Also unexpectedly, across both models we see that several internal and external policy implementation variables are positively

and significantly associated with teen births, including: internal implementing authority staff ($p < .01$), internal implementing authority school wellness committee (($p < .01$), and external implementing authority district wellness committee (($p < .05$). We discuss our interpretation of findings in the following section.

[Insert Tables 3 and 4 Here]

VI. Discussion

Of enduring interest to policy and management scholars is better understanding of what factors contribute to policy and program effectiveness. There is a plethora of research within the related fields of policy and management that addresses this subject matter. However, few studies juxtapose policy and administrative factors to assess the relative influence of each on shaping program outcomes. In this paper, we examine the effectiveness of Florida school district wellness policies in promoting student wellness over the period of 2003-2013. In our analysis, we focus on ascertaining the influence of policy design and school district attributes on teen birth rates among students in Florida school districts. Our policy design variables reflect who is conducting policy implementation activities, who is conducting policy monitoring and evaluation activities, whether or not schools are directed to engage in community outreach to support policy activities or goals, whether policy goals are clearly specified in policies, and whether policies specify incentives for policy non-compliance. Our school district attribute measures reflect district size and districts' human programmatic, personnel, and financial capacity. By modeling different types of resources in juxtaposition, we are able to assess their relative influence on shaping student wellness. This approach aligns with that of public management scholars adopting a resource-based view for assessing public organization performance (Lee and Whitford, 2012).

The preliminary analysis we report in this paper reveals that policy design and district attributes significantly influence teen birth rates among Florida students. We find that having an external entity involved in policy evaluation and monitoring is associated with a decrease in teen births. Scholars have verified that external actor involvement in policy implementation activities can notably shape policy outcomes (Rainey, 2003; Sabatier and Mazmanian, 2003). In our policy case in particular, where the policies are developed at the district level and applied at the school level, it seems practically logical to have the district involved in policy assessment. The role of entities external to schools in evaluation and monitoring may also provide coercive pressure for policy follow-through. Further, having a higher level authority to be accountable to may also facilitate policy objectives.

We also find that direction in outreach to community organizations to support policy activities and goals through policy design is associated with a decrease in teen births. We do not find this result surprising. The effectiveness of community initiatives in reducing rates of teen pregnancy, particularly among African-American and Latino or Hispanic teens, has been well-documented (Centers for Disease Control and Prevention, 2015). Community partners can be instrumental in providing teens information about teen pregnancy and accompanying risk factors to supplement in-school curriculum or programs. School collaboration with external partners can also be critical for addressing various individual, family, and community-level

factors that are associated with teen pregnancy that schools by themselves may not be able to effectively address.

Our results regarding policy implementation and policy goals are a bit puzzling. Having an external versus an internal entity charged with policy implementation activities does not seem to matter. Thus, what we can interpret from the implementation variables results is that where policies direct implementation activities, we see an increase in teen births. We suspect that these puzzling results regarding policy implementation and policy goals could be a result of a selection bias: that districts with higher teen birth rates are more likely to adopt clear provisions to clarify school health policy goals and to define policy implementation authorities. We perhaps need to further consider our goal and implementation variables as endogenous regressors.

We acknowledge that the study reported in this paper is based on a top-down analysis of public organization effectiveness. It is worthwhile to acknowledge the implications of our analytical approach. First, it is important to acknowledge the possibility that actual behavior differs from policy sanctioned behavior. Indeed, policy and programmatic activities could be performed very differently than what is stipulated in an organizations' institutional mandate. This possibility limits the ability to assert relationships between policy design variables and performance outcomes with absolute certainty. Still, a top-down approach is useful as policies, such as those coded for this project, are indeed the formal, binding rules in relation to which public organizations are held accountable. They are deliberately crafted to opportune and constraint the behavior of public personnel in ways that are expected to facilitate the attainment of broader public goals.

VII. Conclusion

This research intersects public policy and public management scholarship to further an understanding of the link between policy design, public organizations, and policy effectiveness. Through this research, our aim is to showcase how research from these cognate fields can be complementarily applied to advance our understanding of key policy variables. With our mixed method approach, we also demonstrate how nuanced qualitative policy design data can be coupled with secondary quantitative data to support generalizable, statistically derived results. While the results we present in this paper are preliminary, we are able to assert that both policy design and public organization attributes matter. Our subsequent research will more fully elaborate on how.

VIII. References

Basurto, Xavier, Gordon Kingsley, Kelly McQueen, Mshadoni Smith, and Christopher M. Weible. "A systematic approach to institutional analysis: applying Crawford and Ostrom's grammar." *Political Research Quarterly* (2009).

Birkland, Thomas A. *An introduction to the policy process: Theories, concepts and models of public policy making*. Routledge, 2014.

Bryson, John M., Barbara C. Crosby, and Melissa Middleton Stone. "The design and implementation of Cross-Sector collaborations: Propositions from the literature." *Public administration review* 66, no. s1 (2006): 44-55.

Carter, David P., Christopher M. Weible, Saba N. Siddiki, John Brett, and Sara Miller Chonaiew. "Assessing policy divergence: How to investigate the differences between a law and a corresponding regulation." *Public Administration* 93, no. 1 (2015): 159-176.

Centers for Disease Control and Prevention. Accessed September 30, 2016. http://www.cdc.gov/teenpregnancy/projects-initiatives/communitywide.html

Florida Department of Health. Accessed July 18, 2015. http://www.floridahealth.gov/programs-and-services/childrens-health/school-health/reports-information.html

Florida Department of Agriculture and Consumer Services. Accessed August 18, 2015. http://www.freshfromflorida.com/Divisions-Offices/Food-Nutrition-and-Wellness/Administering-Your-Nutrition-Program/National-School-Lunch-Program/Wellness-Policies/Districts

Food and Nutrition Service. Last modified March 30, 2016. http://www.fns.usda.gov/tn/local-school-wellness-policy

Food and Nutrition Service. Last modified September 1, 2015. http://www.fns.usda.gov/tn/local-school-wellness-policy-requirements

Freudenberg, Nicholas, and Jessica Ruglis. "Reframing school dropout as a public health issue." *Preventing Chronic Disease* 4, no. 4 (2007).

Granovetter, Mark S. "The strength of weak ties." *American journal of sociology* (1973): 1360-1380.

Hofferth, Sandra L., Lori Reid, and Frank L. Mott. "The effects of early childbearing on schooling over time." *Family planning perspectives* (2001): 259-267.

Jung, Chan Su. "Navigating a rough terrain of public management: Examining the relationship between organizational size and effectiveness." *Journal of Public Administration Research and Theory* 23, no. 3 (2013): 663-686.

Lee, Soo-Young, and Andrew B. Whitford. "Assessing the effects of organizational resources on public agency performance: Evidence from the US federal government." *Journal of Public Administration Research and Theory* (2012): 647-671.

Lowi, Theodore J. "American business, public policy, case-studies, and political theory." *World politics* 16, no. 04 (1964): 677-715.

Makinson, Carolyn. "The health consequences of teenage fertility." *Family Planning Perspectives* (1985): 132-139.

Mondou, Matthieu, and Eric Montpetit. "Policy styles and degenerative politics: Poverty policy designs in Newfoundland and Quebec." *Policy Studies Journal* 38, no. 4 (2010): 703-722.

Ostrom, Elinor. *Understanding institutional diversity*. Princeton university press, 2009.

Park, Hyun Hee, and R. Karl Rethemeyer. "The politics of connections: Assessing the determinants of social structure in policy networks." *Journal of Public Administration Research and Theory* 24, no. 2 (2014): 349-379.

Patel, Payal H., and Bisakha Sen. "Teen motherhood and long-term health consequences." *Maternal and child health journal* 16, no. 5 (2012): 1063-1071.

Pressman, Jeffrey L., and Aaron B. Wildavsky. "How great expectations in Washington are dashed in Oakland." (1973).

Rainey, Hal G. *Understanding and managing public organizations*, 3rd Edition. John Wiley & Sons, 2003.

Rainey, Hal G., and Paula Steinbauer. "Galloping elephants: Developing elements of a theory of effective government organizations." *Journal of public administration research and theory* 9, no. 1 (1999): 1-32.

Sabatier, Paul, and Daniel Mazmanian. "The implementation of public policy: A framework of analysis." *Policy studies journal* 8, no. 4 (1980): 538-560.

Schneider, Anne L., and Helen M. Ingram. *Policy design for democracy*. University Press of Kansas, 1997.

Schneider, Anne, and Mara Sidney. "What is next for policy design and social construction theory? 1." *Policy Studies Journal* 37, no. 1 (2009): 103-119.

Siddiki, Saba. "Assessing Policy Design and Interpretation: An Institutions-Based Analysis in the Context of Aquaculture in Florida and Virginia, United States." *Review of Policy Research* 31, no. 4 (2014): 281-303.

U.S. Department of Health and Human Services. Accessed September 30, 2016. http://www.hhs.gov/ash/oah/adolescent-health-topics/reproductive-health/teen-pregnancy/trends.html

Wichowsky, Amber, and Donald P. Moynihan. "Measuring how administration shapes citizenship: A policy feedback perspective on performance management." *Public Administration Review* 68, no. 5 (2008): 908-920.

Wilson, James Q. *American government: Institutions and policies*. Lexington, KY: D.C., 1979

IX. Tables and Figures

Table 1: District and Student Data Variables

Variable	Variable Measure	Variable Type
Policy design: policy implementation	Entity charged with policy implementation authority	Key Explanatory Variable
Policy design: policy monitoring and evaluation	Entity charged with policy monitoring and evaluation authority	Key Explanatory Variable
Policy design: collaboration	Whether policy encourages school outreach to community partners in policy activities and goals	Key Explanatory Variable
Policy design: policy goals	Whether policy specifies wellness policy goals	Key Explanatory Variable
Policy design: policy incentives	Whether policy specifies rewards or sanctions for policy non-compliance	Key Explanatory Variable
District size	Student enrollment	Control
Programmatic resources	Staff/parent consultations per year	Control
Programmatic resources	Health services per student per year	Control
Personnel Resources	Nurse to student ratio	Control
Financial resources	Per student health funding	Control
Student health	Birth rate per 1,000 for teens 11 to 18 years of age	Dependent

Table 2: Policy Design Variables: Definitions and Measurement

Policy Design Variable	Wellness Policy Measure	Measure Coding
Policy implementation	Staff	Policy implementing authority not staff/staff: 0/1
Policy implementation	School administrator	Policy implementing authority not school administrator/school administrator: 0/1
Policy implementation	School wellness committee	Policy implementing authority not school wellness committee/school wellness committee: 0/1
Policy implementation	District wellness committee	Policy implementing authority not district wellness committee/district wellness committee: 0/1
Policy implementation	External administrator	Policy implementing authority not external administrator/external administrator: 0/1
Policy evaluation	Staff	Policy evaluating authority not staff/staff: 0/1
Policy evaluation	School administrator	Policy evaluating authority not school administrator/school administrator: 0/1
Policy evaluation	District wellness committee	Policy evaluating authority not district wellness committee/district wellness committee: 0/1
Policy evaluation	School wellness committee	Policy evaluating authority not school wellness committee/ school wellness committee: 0/1
Policy evaluation	External administrator	Policy evaluating authority not an external administrator/external administrator: 0/1
Collaboration	Community outreach	Outreach with community not specified/specified: 0/1
Policy goals	Physical activity and Nutrition	Physical activity and nutrition goals not specified/ specified: 0/1
Policy goals	Staff wellness	Staff wellness goals not specified/specified: 0/1
Policy goals	Social & emotional wellness	Social and emotional well-being goals not specified/specified: 0/1
Policy goals	Health and Safety	Health and safety goals not specified/specified: 0/1
Policy incentives	Addressing non-compliance	No action relating to school non-compliance/action: 0/1
Policy incentives	Schools receiving awards or recognition	No recognition or award available/ available: 0/1

Table 3: Summary Statistics

Variable	Obs.	Mean	Standard Deviation	Minimum	Maximum
Teen Birth Rate	611	16.2559	8.4047	0	45.02
Implementing authority – Staff	723	0.1024	0.3033	0	1
Implementing authority – Administrator	723	0.1798	0.3843	0	1
Implementing authority – School wellness committee	723	0.1812	0.3854	0	1
Implementing authority – District wellness committee	723	0.2835	0.4510	0	1
Implementing authority – External administrator	723	0.1729	0.3784	0	1
Policy evaluating authority – Staff	723	0.0858	0.2802	0	1
Policy evaluating authority – Administrator	723	0.3458	0.4760	0	1
Policy evaluating authority – School wellness committee	723	0.0927	0.2902	0	1
Policy evaluating authority – District wellness committee	723	0.2891	0.4536	0	1
Policy evaluating authority – External Administrator	723	0.1024	0.3033	0	1
Outreach to community	723	0.2877	0.4530	0	1
Physical Goal	723	0.6418	0.4798	0	1
Health Safety Goal	723	0.2766	0.4476	0	1
Rewards or Incentives	521	0.1324	0.3393	0	1
District size	723	39872.58	64249.12	966	376159
Health education classes per year	723	1668.563	8607.125	0	222545
Staff/Parent Consultation per year	723	52857.64	82761.87	0	585881
Health Services per student per year	723	13.7381	7.5370	0.85	57.68
Health funding per student	723	2701.197	4303.725	2.508	28190.61

Table 4: PCSE models with heteroskedastic panel corrected standard errors

Variables	(1) Teen Birth Rate (county)	(2) Teen Birth Rate (county)
Internal implementing authority – Staff	**7.260*** **	**7.251*** **
	(1.738)	**(1.715)**
Internal implementing authority – Administrator	-2.347	-2.001
	(1.844)	(1.796)
Internal implementing authority – School wellness committee	**5.738** **	**6.266*** **
	(2.288)	**(2.212)**
External implementing authority – District wellness committee	**2.256** **	**2.467** **
	(1.023)	**(1.000)**
External implementing authority – External administrator	3.120	3.444
	(2.238)	(2.177)
Internal evaluating authority – Staff	-1.875	-2.089
	(2.829)	(2.763)
Internal evaluating authority – Administrator	0.144	-0.196
	(1.786)	(1.759)
Internal evaluating authority – School wellness committee	0.145	-0.381
	(2.995)	(2.940)
External evaluating authority – District wellness committee	**-11.48*** **	**-11.73*** **
	(1.275)	**(1.249)**
External evaluating authority – External Administrator	**-10.66*** **	**-10.69*** **
	(1.659)	**(1.636)**
Outreach to community	**-2.980***	**-2.952***
	(1.621)	**(1.596)**
Physical activity goal	-3.003	-2.990
	(2.115)	(2.070)
Health Safety goal	**4.929*** **	**4.723*** **
	(1.463)	**(1.447)**
Rewards or incentives	0.715	0.870
	(1.817)	(1.804)
District size		**-2.07e-05*** **
		(4.85e-06)
Health education classes per year		-3.76e-06
		(1.57e-05)
Staff/Parent Consultation per year		-5.72e-06
		(4.05e-06)
Health Services per student per year		0.0386
		(0.0516)
Health funding per student		3.65e-05
		(7.74e-05)
Constant	18.78***	19.34***
	(0.555)	(0.948)
Observations	611	611
R-squared	0.476	0.494
Number of Districts	67	67

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1