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Behaviour architects: a framework for employing behavioural insights in public policy practice

Abstract

Objectives: Responses to policy initiatives of citizens and organisations often differ from those expected by policy designers. The article offers an analytical framework for holistic mapping of mechanisms driving policy addressees' behaviours.

Research design & methods: Article uses systematic literature review of policy design and behavioural insights studies to develop the framework. The framework is then empirically tested in a case study of a policy implemented in 2015 by the government of Poland to address the problem of obesity in school children. Methods include in-depth interviews with adults parents, school principals, canteen staff, surveys, and focus groups with parents and teenagers, ethnographic observations in school canteens.

Findings: The empirical test proved the utility of the analytical framework in identifying flaws in policy design. Framework helped: (1) articulating an overall theory of change of regulation; (2) reframing the policy issue in behavioural terms, i.e., stating who, how, and in what context did not comply, and (3) identifying reasons for non-compliance related to capacity, motivation and opportunities of the policy subjects.

Implications / Recommendations: The article proposes that policy designers should work as behaviour architects in order to design more effective public policies and avoid policy failures. They should consider mechanisms facilitating or hampering expected behaviours of policy addressees.

Contribution / Value added: This article contributes to the theory and practice of policy design. It operationalises determinants of policy compliance from the perspective of applied behavioural science. It helps public policy scholars and practitioners to think systematically about policy subjects' behaviours, decisions, and their determinants when analysing and designing policy solution.

Article classification: theoretical article – conceptual article.

Keywords: behavioural insight, public policy design, evaluation, behavioural economics.

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Introduction

Public policies aim to regulate and improve the life of policy addressees (citizens, private and public organisations) by guiding them towards socially desirable behaviours (Datta & Mullainathan, 2012; Shafir, 2013a). Thus, the key issue of policy success or failure is the degree to which policy subjects comply with governmental preferences and bring structural change by behaving in a required way.

Looking broadly, understanding the mismatch between the expected impact of policy interventions and real behavioural effects is explored from two perspectives, in two streams of literature. The first perspective focuses on policy design, hypothesising that policy failure is an effect of incorrect "theory of change", which means a set of assumptions established by policy designers about the causal relation between specific policy problem, profile of policy addressees, and form of intervention that triggers their response and bring an expected effect (Donaldson, 2007; Pawson, 2013; Soman, 2017; Peters, 2018). The second perspective is concerned with policy delivery, hypothesising that policy ineffectiveness is caused by defective "theory of implementation", which is an execution of a sequence of technical, day-to-day implementation activities and inadequate institutional arrangements required to deliver the intervention. This perspective is covered by policy implementation literature (Pressman & Wildavsky, 1973; Zawicki, 2016).

In policy design literature and practice recent years have brought a significant conceptual shift. Initially, it was dominated by a classical economy approach that assumes full rationality of policy actors. However, gradually it started to recognise the bounded rationality of policy addressees and a more context-sensitive policy toolkit (Colebatch, 2018). Three new perspectives have been emerging for exploring the issue of mechanisms of (non-) compliance. The neo-institutionalist approach provides an insight into different dimensions of a policy actor's choice: cognition (to perceive, to know), affect (feelings, moral engagement), and evaluation (calculation), and how institutions impact behaviours (Etienne 2010). Social norm perspective focuses on unwritten rules shared by a group, the respect of which is sanctioned both positively and negatively by the group's members. However, most of those studies are theoretical and explores the matters of compliance indirectly (Etienne 2010). Finally, the realistic models of behaviours try to integrate public policy and service design (Weaver, 2015; Hill & Hupe, 2014; Stanford University, 2016). It focuses on barriers and gaps in motivation or targets' capacities that hinder targets' compliance.

Despite this recent development of literature in policy design, there are three shortcomings in current thinking on policy compliance. Firstly, there is a significant degree of incoherence between different strands of literature in terms of the conceptual framing of the basic analytical vocabulary used to describe key compliance determinants. Secondly, specific practical applications (OECD, 2017; Behavioural Insights Team, 2015) tend to focus more on individual behaviour (behavioural nudges), at the expense of social and institutional aspects, causing a risk of cognitive tunnelling of policy designers. Thirdly, the majority of approaches offer points of advice but rarely provide a coherent framework that could translate into practical procedure applied in policy design. Thus there is a need for a more comprehensive approach that would bring together recent developments.

This article aims to contribute to the policy design literature by addressing the following question: how can mechanisms of compliance in policy addressees' behaviours be identified in a systematic way, in order to design effective policy responses?

In this article we take the perspective of policy designers. We portray them as Behaviour Architects: people who use a combination of policy tools to shape the compliance mechanisms of policy addressees. In order to design effective interventions, behaviour architects need to map and understand well the behavioural mechanism they want to trigger.

We believe that the compliance of policy addressees is embedded in a certain situation. It is a result of a complex behavioural mechanism driven by individual characteristics of subjects and contextual constraints (Michie et al., 2011; Ostrom, 2010; Astbury & Leeuw, 2010; Pawson, 2013; World Bank, 2015).

Building on interdisciplinary developments, we offer an analytical framework for holistic mapping of gaps and barriers to compliance in policy subjects' behaviours, and we test it in a case study of real-life regulation. The next section of the article presents the methodology of our research. Section three provides a conceptual framework for mapping mechanisms of behavioural compliance of policy addressees. Section four employs this conceptual framework in a case study, explaining the discrepancy between policy design (objectives) and policy results of a Polish government policy initiative targeted at the problem of obesity in school children. In conclusions, we discuss the strengths and weaknesses of the proposed framework as well as the implication for policy practice.

We hope that this framework will help policy designers to build their theory of change with more systematised and accurate insights about the behaviours of the policy addressees.

Methodology

The theoretical framework has been developed based on a systematic literature review covering policy design and behavioural insights studies. The framework was tested via a case study of a design of policy introduced by the government of Poland in 2015 to address the problem of obesity in school children by changing the rules of operations for Polish school cafeterias and canteens (in Polish: *Ustawa z dnia 28 listopada 2014 r. o zmianie ustawy o bezpieczeństwie żywności i żywienia z dnia z dnia 25 sierpnia 2006 r.*) (Dz. U. z 2014 r. poz. 1662, 1722).

The case was selected based on its social and scientific relevance. World Health Organization stresses that childhood obesity is one of the most significant public health challenges of the 21st century. Globally, in 2015 the number of overweight children under the age of five is estimated to be more than 42 million (WHO 2017). Poland is not an exception. According to the Polish National Food and Nutrition Institute, a fifth of all school-aged children are overweight.

Due to alarming data, the problem of obesity was constantly gaining public recognition. Over 10 years, the number of scientific publications on the subject of childhood obesity and healthy nutrition of children in schools has increased significantly: from 167 articles published in 2005 to 1280 in 2015 (data derived using the Google Scholar search engine. Keywords for the search included "childhood obesity" and "healthy nutrition of children in schools").

Furthermore, this policy issue is regarded as a good field to test the liberal paternalism type of policy tools. It is a field in which serious societal problems emerge (obesity in children and related health-care costs), while standard policy tools such as strict regulation (bans) could be seen as overly intrusive with regard to citizens' behaviour (Thaler, 2008; Sunstein, 2008).

The case study research design was used because it is appropriate for inquiry aiming to answer the questions "how?" and "why?" about contemporary phenomenon when boundaries between the phenomenon and context are not evident (Yin 2014). We used a single case study with multiple embedded units of analysis. The

main unit of analysis was schools, but we also questioned specific sub-groups: pupils, parents, school principals, teachers, cafeteria owners, and school canteen staff.

To gather a better understanding of how different contextual factors could play a role in policy implementation, we selected a diverse set of schools. Firstly, we selected schools located in different kinds of municipalities (e.g. a big city with more than 1 million inhabitants with schools from both wealthier and poorer neighbourhoods, and a medium-sized town with about 60 thousand inhabitants). Secondly, we investigated schools with different experiences regarding educational programs about healthy eating habits.

Within the case study, we have applied a mixed-method approach. To better understand the content of the regulations, we conducted a systematic narrative review of the literature on similar programs. We searched scientific databases using the following keywords: TS=(children AND primary school* AND (obesity OR overweight) AND (eating habits OR behaviour*) AND prevention). After the initial title and abstract review, 448 papers were selected for further investigation, and 25 papers were included in the in-depth narrative review.

The desk research was followed by collection of empirical data in school settings. It covered: 65 in-depth interviews with adults (parents, school principals, canteen staff), paper and pencil interviews (PAPI) with parents of primary school pupils (n=635) and teenagers from secondary schools (n=150), approximately 30 hours of ethnographic observations in primary school canteens during lunchtime, and three focus group interviews (participatory workshops) with teenagers from secondary schools.

Theoretical framework

The analytical framework was a three-stage procedure that consisted of: (1) articulating overall theory of change; (2) framing the policy issue in behavioural terms, i.e. stating who, how, and in what context should behave (including detailed mapping of stakeholders) and (3) investigating gaps in compliance. Each element is grounded in a particular stream of literature, accompanied by a set of conceptual framework. Our understanding of "analytical framework" is a set of conceptual canvas that identifies key variables and relations, and makes possible the integrating of different theories with an aim of explaining system relations (Ostrom, 2005, pp.7–11).

Articulating overall Theory of Change

Public policy is a problem solving through trial and error process (Lasswell, 1951; Bardach, 2006). That means that actors involved in policy design debate about misbehaviour they want to turn into compliance, hypothesise about the roots of the problem in a particular context (what factors obstruct compliance), and speculate about optimal policy tools for addressing those obstacles and ameliorating the problem.

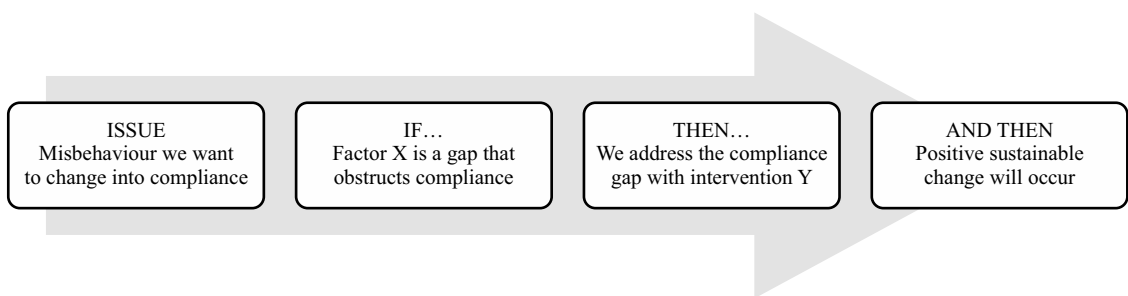| ISSUE Misbehaviour we want to change into compliance | IF… Factor X is a gap that obstructs compliance | THEN… We address the compliance gap with intervention Y | AND THEN Positive sustainable change will occur |

Figure 1. Generic Theory of Change

Source: own work.

The logical chain of these assumptions can be articulated in the form of Theory of Change. Figure 2 presents a generic version of that. The Theory of Change approach is well grounded in the program evaluation literature (Chen, 2005; Coryn et al., 2011; Donaldson, 2007; Astbury & Leeuw 2010). It is also aligned with human problem solving as hypothesis testing (Evans, 2017).

Theory of Change is a simple logical structure that helps Behaviour Architects bring together assumptions and ideas generated at the different stages of policy design, and assess their overall logic, in particular the logical connection between root problem and possible response.

Although canvas is highly linear, in reality it is built iteratively. Policy designers and other actors involved in policy problem-solving fill in individual boxes with initial ideas, switch between them, and zoom in and out onto the details of each box as the design of the policy progresses.

Reframing policy issues in behavioural terms

The public policy cycle starts with agenda setting. It is determined by a complex combination of state of domestic and international affairs, political momentum, and media feeds. What follows, however, is a policy issue formulation (framing) that opens the process of policy design (Fischer et al., 2007; Howlett, 2011).

The policy formulation stage is pivotal, because the same issue can be framed in different ways and that, in turn, determines further answers and selection of policy tools. The framing is partly informed by outcomes of data-driven problem analysis, and partly by value choices in the public sphere. Colebatch & Hoppe (2018) illustrate this point well with an example of the care of young children for parents who want to be in a paid workforce. This policy issue can be framed as labour market participation (enabling parents to work), child development and education (facilitating socialisation and early learning), or even market externalities (who bears the costs of care).

For policy designers operating as behaviour architects, "reframing" means translating policy issue into a specific statement about policy actors, their (mis)behaviour that should be changed into compliance, and the context in which it takes place. The identified policy actors will become policy addressees (also called policy subjects or policy targets). Designers define the characteristics of addressees' behaviours (individual choice, repeated individual actions – routines or collective actions) and ponder the desired level of compliance. Weaver (2015) points out that governmental preferences can span from insisting on imposing specific standards (e.g. do not drink and drive), through being moderately insistent (saving for retirement, giving up smoking) to articulating vague aspirations (improving household energy efficiency). This desired level of compliance will, in turn, determine the degree of obligation imposed and coercive force used as intervention.

We agree with Gofen (2015) that policy non-compliance, understood as the lack of change in addressees' behaviour in reaction to government action is not a simple, homogenous phenomenon. One of the fundaments to understand this hetero-geneity is the ability to correctly define and understand the context in which behaviour of policy addressees takes place. Thus, two concepts can be of assistance: the Action Situation and the Stakeholder Map.

The Action Situation concept, which derives from the Institutional Analysis and Development Framework, can provide a helpful framework for Behaviour Architects (Ostrom, 2005; 2010, p. 646). Action Situation denotes social or physical space, an arena in which choices are made (McGinnis, 2011). It helps to organise thinking about real-world policy implementation by creating an analytical setting within which we can observe and analyse policy subjects and their behaviours (with their heterogeneity) without losing sight of other key elements that could either hinder or foster the achievement of policy goals.

Behaviours take place in the context of social interactions. Therefore it is necessary to map

stakeholders, defined as "any person, group, or organisation that possesses a stake (e.g., interest, legal obligation, moral right) in a decision" (Navarrete & Modvar, 2007). In the case of public policies, these are policy actors that are likely to affect or be affected by the designed intervention (Bryson, 2011). The assumption is that inclusive policies are more advantageous when tackling complex issues and their implementation is more efficient when different perspectives and actors are taken into account at the design stage (Navarrete & Modvar, 2007).

A simple visual tool aligned with the Action Situation concept – three circles – can help with identifying stakeholders. It is borrowed from architectural and service design (Stickdorn & Schneider, 2012; Binnekamp et al., 2006). The central circle is the target population, the group whose behaviours are targeted. The second circle holds participants that are physically present in the action situation with the analysed target group. In the outer circle, we place stakeholders not physically directly present in the action situation

but having a potential impact on the key addressees' behaviours.

Hypothesising about gaps in compliance

The desired outcome of governmental policies is a change in the behaviour of targeted individuals. Understanding factors that hinder or prevent such compliance should be the focal point when planning an intervention. However, the behaviour is always a derivative of an amalgam of factors, and it is challenging to perform analysis in a comprehensive yet synthetic way.

In order to unpack the box of factors hindering or preventing compliance (the second box in Theory of Change frame), we propose to use the COM-B model as a canvas. This model was developed by Michie, van Stralen and West (2011), who aimed "…to identify the simplest overarching model needed to account for a change in behaviour." (2013, p. 6). Their systematic review of 83 behaviour change theories (Mitchie et al., 2014), a consensus meeting of behavioural theorists in the USA
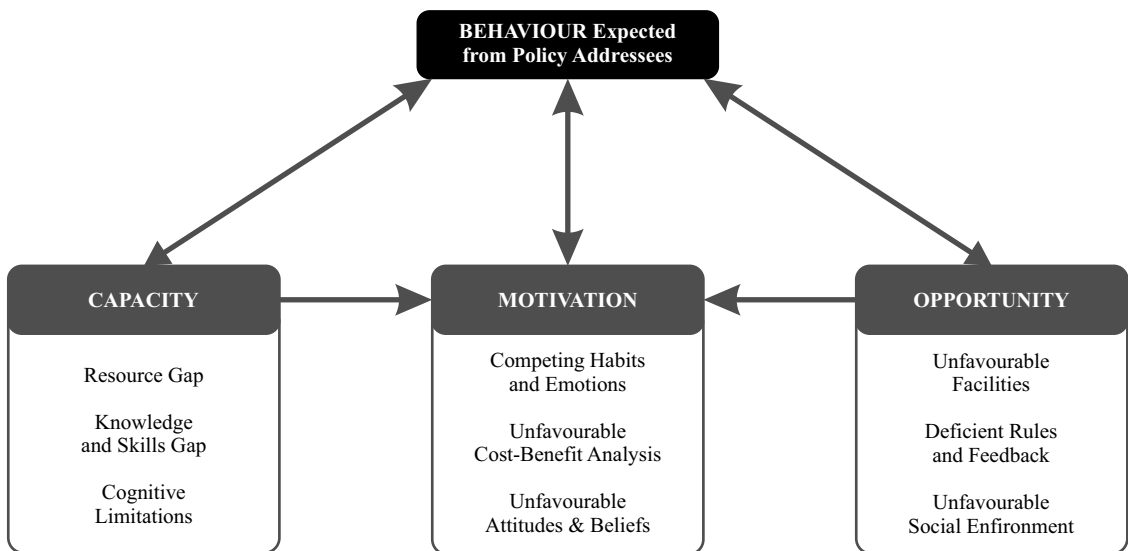

Figure 2. COM-B model for analysis of behavioural drivers

Source: Adapted from (Michie, van Stralen, & West, 2011), (Soman, 2017), and Weaver (2015).

in 1991 and a principal of US criminal law refer to same three factors necessary for performing an action. These are: (1) capacity to perform an action; (2) motivation to perform an action; and (3) lack of environmental obstacles precluding one from performing an action.

We follow this logic, but we propose to unpack some of the concepts used in the model in a different way (see: Figure 2). Capacity is understood as the individual (personal) means of policy actor required to perform an action. The obstacles to behaviour in this category could include: deficits in personal resources (time, money, physical strength), gaps in knowledge or skills to perform specific actions, or cognitive limitations (understood as a spectrum of different cognitive biases that could hamper policy addressee's decisions). Motivation includes factors that drive policy subjects to action. The obstacles in this category include primary barriers related to conflicting emotions or rooted habits, analytical calculation of potential profits or losses, or higher purpose coming from attitudes and beliefs. Finally, the last group of potential deficits blocking desired behaviour can be rooted in contextual factors. Opportunity covers the lack of required infrastructure to perform actions (facilities), deficient setting or execution of rules related to behaviour, or social influence working against compliance.

The proposed model enables Behaviour Architects to hypothesise where critical gaps or barriers to compliance are rooted, and what minimal configuration of capacity, motivation, and opportunity would enable the policy addressee to display the desired behaviour.

Case study: a junk food ban in schools

In 2014 the Polish Parliament made amendments to the Food and Nutrition Safety Act, introducing new regulations concerning the functioning of school canteens and tuck-shops. Foods and drinks high in fat, salt, and sugars were banned. The Ministry of Health issued a detailed list of banned products and introduced limits for sugar, salt and fat that could be used during meal preparation by school canteens. The motivation behind this change was to stop a negative trend and "save children's health by promoting healthy eating habits" (as explicitly stated during the parliamentary debate).

The regulation in question is a clear example of policy failure. In 2018, three years after the introduction of the law, the Polish Institute of Food and Nutrition and the Institute of Mother and Child stated in various reports that child obesity rates in Poland were among highest in Europe and children consumed a significant amount of sweets and salted snacks. It seems that the regulation did not change the behaviour of children, which had been expected in working reports published soon after the regulation was introduced in 2015.

Additionally, the regulation has been widely criticised, and "banned buns" became a buzz phrase in Polish media, both in traditional and social channels. Jokes about young people "smuggling" illegal sweets and crisps into schools, being involving in "junk food" organised crime networks and making fake ID cards in order to be able to buy "adults-only food" started to appear in TV shows and stand-up comedy routines. School principals reported that canteens operators were withdrawing from contracts as a result of the limited ability to sell the most profitable snacks.

In the next sections, we will apply our theoretical framework to explain the failure of policy regulation introduced in Poland. We argue that the potential barriers could have be noted before the introduction of the policy if an appropriate analytical framework had been applied. This case will illustrate the potential strengths and weaknesses of the framework in providing a fuller picture of gaps in compliance.

Reconstructing Overall Theory of Change

The simplified logic of the Polish regulation is shown in Figure 3.

The implementation of the regulation started with the introduction of the food list to

school canteens and tuck-shops. Also, vending machines were removed from schools and all kinds of promotion of "junk food" within school premises was prohibited. To enforce the compliance, local Sanitary Inspectorates carried out school inspections, and violations could be punished either with a financial penalty (up to EUR 1,000) or the termination of the contract with the canteen/shop operator. Thus, the Polish Government chose a solution from "the upper end of the intrusiveness scale" (Weaver 2014), to prohibit specific behaviour and to punish non-compliant behaviour.

The designers of the policy used a simple instrument, i.e. a ban, combined with penalties for owners of stores and school cafeterias, as well as school principals, that failed to comply with the regulation. However, those actors were not the regulation's target group, they were merely a means to ensure the compliance of the actual target group: children attending educational facilities. Thus, the regulation was targeted at changing the behaviour of school children, so that they would start choosing healthy food. This assumption seems far-fetched, but in order to check its rationality we will have to unpack the black box of the behaviour.

Figure 3 also shows the challenge with a second causal link, between changed behaviour and ultimate policy impact. Childhood obesity is a result of "life style", which includes dietary choices as well as patterns of physical activity. Regulators targeted only the former, in a very narrow context, i.e. school, not taking into account the world outside school. However, to increase the probability of achieving its goals, such a regulation should be more comprehensive, i.e. take into account other situations in which children consume food, as well as target physical activity – the second component which, if there is a lack thereof, contributes to obesity.

We argue that such shortcomings could have been avoided if the regulatory bodies had followed several steps we propose in our framework.

Reframing Policy Issues in Behavioural Terms

The first of such practical steps is reframing the policy issue into behavioural terms. That means defining who should behave how and in what situations. This case study starts with listing the key policy targets (i.e. "Who?"). The policy
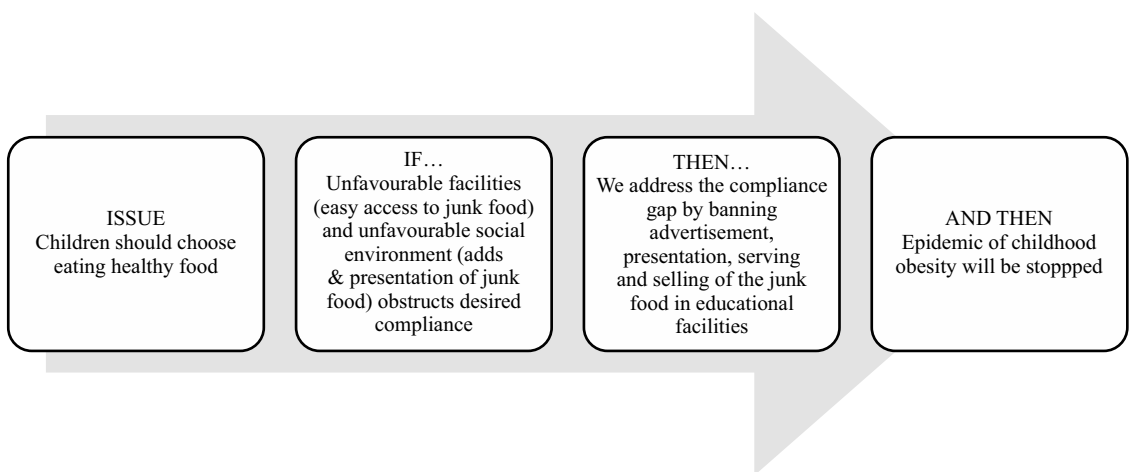

Figure 3. Intervention logic of case study regulation

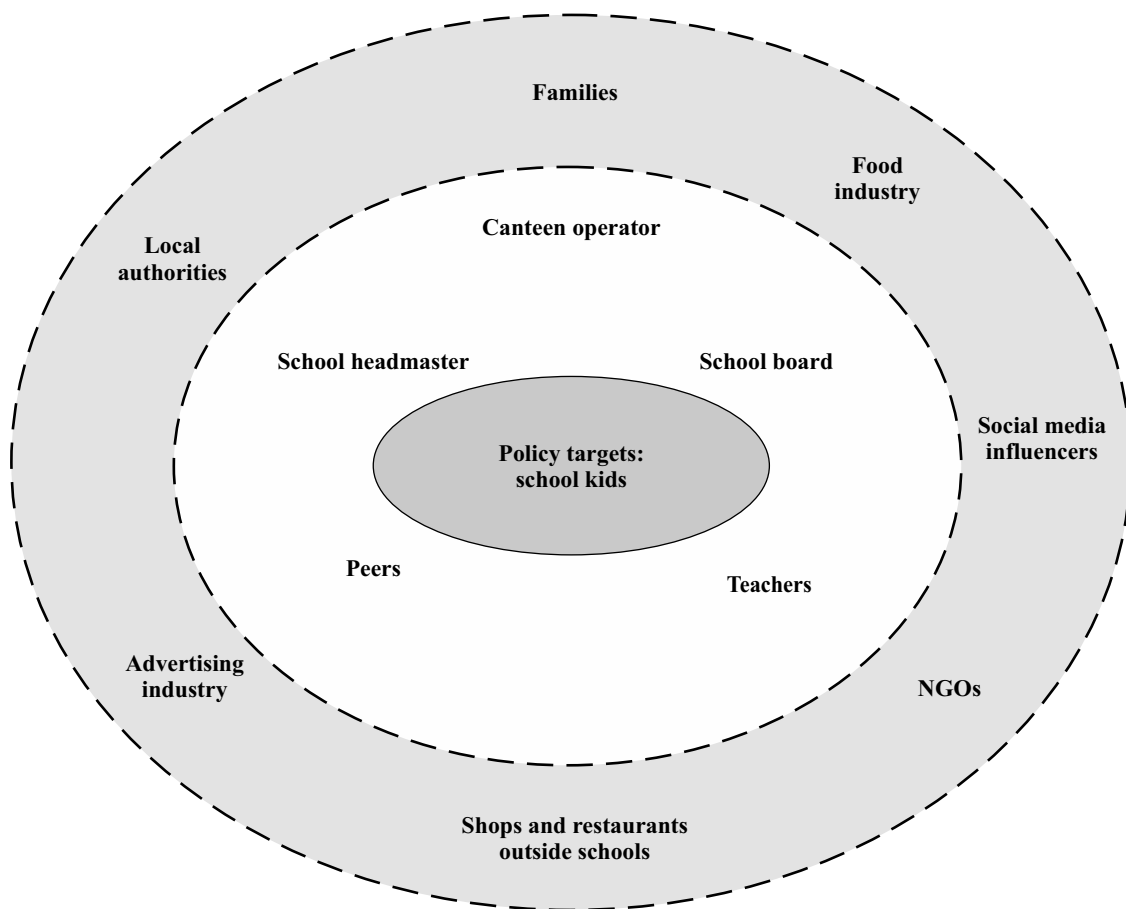Source: Food and Nutrition Safety Act changes in 2014.

Figure 4. Stakeholder map for the case study regulation

Source: own work.

aimed to affect the behaviour of children (aged six to twelve) and young people (aged 12 to 15).

A policy-making process aimed at increasing the compliance of targets with certain aims should not only build on understanding the primary subjects (with their heterogeneity) but also map other stakeholders that could affect the addressees' behaviour. The following figure shows the stakeholder map for the case study regulation.

At the centre of the policy, we put the key subjects (targets) of the policy: school children. However, when we recall what kinds of measures have been used in the regulation, we immediately understand that there were no direct actions to

change the behaviour of children. Policy makers only used tools addressing the actions of canteen operators and additional measures involving headmasters and school boards to enforce the new regulations. Hypothetically, children's behaviour was intended to change as a reaction to a change in their school environment.

The regulation had several blind spots. It did not address any possible social influences that could either help or hinder its introduction, e.g. it failed to involve the effects of either school peers or teachers. Moreover, the policymakers did not take into account the complex reality of the external world with various stakeholders

that could influence the results of the policy. The regulation did not consider any potential influences on children's eating behaviour from family, media and advertising companies, NGOs (often involved in the promotion of a healthy lifestyle), social media influencers (role models, be they supportive or disruptive), and local shops (which could provide resources that had been banned in schools).

The stakeholder mapping made it possible to show that the Polish government had decided to influence only those stakeholders that were within the educational administrative system (canteen operators tied by legal agreements, school directors and boards operating based on the relevant legal acts). The government did nothing to involve other stakeholders (such families and the media) or to regulate influential interest groups (such as the food and retail sectors).

This has led to two kinds of problems with regard to the effectiveness of the policy: firstly, the diagnosis of situation was oversimplified, and – as such – resulted in suboptimal policy tools being selected. Secondly, many of the stakeholders that were not involved in government actions were further involved in the critical public debate around the regulation, which had an additional diminishing effect on the regulation's legitimacy and acceptance within society.

Secondly, to better understand the context (when and where targets behave), we identify key action situations in which policy targets engage in interactions that could result in compliant (eating healthy foods) or non-compliant behaviour (consuming junk food).

Let us recall that the primary targets were school children and teenagers. Yet the only action situation within which the regulation changed operational rules for targets was school (what can be bought from a tuck-shop or eaten in a canteen). During our exploratory research we identified other important action situations which were entirely ignored by the policy designers.

Firstly, policymakers did not include any actions to alter the behaviour of the policy targets (children) within the primary action situation they

live in and make decisions, i.e. family. Review of evidence that accompanied our ethnographic research showed that: inclusion of families increases the chances of success (Kipping et al., 2014; Schäfer Elinder et al., 2012; Jordan et al., 2008); children in families with higher socioeconomic status change their eating habits more easily (Plachta-Danielzik et al., 2011); as do those with better-educated parents (Llargues et al., 2011). Our empirical findings were in line with this strand of evidence. The family action situation should be the focal point of analysis preceding the selection of policy tools aiming at changing the eating habits of children.

One could argue that there is nothing wrong with focusing efforts on the one action situation. However, in the given case neither regulation (prohibition) nor the accompanying implementation measures (junk- and healthy-food checklists) nor the compliance enforcement tools (inspections and punishment for canteens operators) have acknowledged the impact of the family action situation on children's eating habits.

During our research we identified possible ways in which the family action situation could interact with the school action situation, in a way that has an impact on whether targets comply or not with the policy. The family action situation determines in particular two working elements, i.e.:

- the target preferences and the level of information children could use in the school action situation (what kind of food is desirable, what is healthy/unhealthy food);
- the target degree of control over action in the school situation (i.e. by either providing home-made snacks or giving children pocket money to be spent on food).

Moreover, policymakers have failed to address the other significant action situation in which the eating habits of the policy targets could form or change, i.e. the social life action situation (that could be split to two interacting and mutually enforcing dimensions, i.e. real-world social life and virtual-reality social life, which is extremely important in the case of teenage policy targets).

As described by our interviewees, eating is an essential part of various social interactions they engage in (either in the real world, e.g. meeting at a local McDonalds, or in virtual-reality, e.g. consuming snacks during online gaming with peers).

To sum up, as far as action situations are concerned, the policymakers took a simplistic approach and a narrow world-view. They entirely failed to address two critical action situations (family life and social life) in which policy targets behave and make decisions. Furthermore, they did not include any of the policy tools that could enforce compliance, changing neither the micro context of action situations (e.g. the availability of banned foods in shops located near to schools) nor the broader socio-ecological macro context (e.g. economic aspects of the food industry, such as pricing policies, advertising and PR activities of food brands).

Identification of the above-mentioned action situations in which children behave in desired or not desired ways clearly shows the substantial gaps in the intervention logic of the studied policy and provides information on possible sources of non-compliance (multifaceted impacts of other action situations, family and social life, on children's eating behaviour). The systematic review of the evidence on the effectiveness of healthy eating programs conducted during our research clearly showed that the most effective programs are those addressing various elements from different action situations (Laurence et al., 2007).

Investigating Gaps in Compliance:
Case Study Experiences

Looking for gaps that may cause non-compliance of the primary policy targets, we focused on one action situation, i.e. school, which was the only one covered by the policy tools used by the Polish Government.

We started with an analysis of the first component of the COM-B system: capacity, i.e. resource gaps, knowledge and skills gaps, and cognitive limitations.

Firstly, the regulation addressed the level of resources by limiting the availability of junk food in school canteens and tuck-shops. By doing so regulation targeted one of cognitive bias, a psychological myopic: a tendency to think short-sightedly. For children the side effects of eating unhealthy food are distant problems, so they prefer to deal with a more immediate problem: hunger. The pleasure of eating something sweet and salty overshadows the risk of potential future health problems. The regulator decided to overcome this cognitive bias by eliminating this solution from the decision tree of children at school. However, the regulation did not address the availability of the same product categories in the shops located in immediate vicinity of schools. Our observations and interviews showed that children still buy sweet drinks and salty snacks, but they do that either in the morning (on their way to school) or in the afternoon (going home). Sometimes they do not buy food by themselves, especially those who are younger, their parents buy them what they want and give them those things to take to school.

The study of the knowledge and skills of pupils revealed that they had difficulties in assessing the healthiness of food they consume every day. A common assumption of pupils was that junk food is only fast-food, while healthy foods are vegetables and fruits, leaving the rest of the products in a grey zone. Moreover, children believe that the preparation of healthy food is very time-consuming, and they were convinced that the result might not be tasty. They did not know what a healthy snack might be, and they did not have any skills to prepare healthy snacks.

Meanwhile, the introduced regulation has made a clear distinction between "healthy" and "unhealthy" foods. The official list of prohibited foods and practices did not offer any explanation of the choices, and its release was not accompanied by any information campaign that would help people to understand the rationale behind the decisions of the experts. There was an evident lack of divergence between the understanding

of children and that of the government with regard to healthy food, which was not addressed at all.

This discrepancy resulted in two barriers to compliance: firstly, students, their parents, and canteen personnel did not understand why certain foods had been banned. Secondly, students had no knowledge about how healthier alternatives could replace the banned food. Canteen personnel also said they lacked knowledge about how to prepare a tasty meal without ingredients from the list. During interviews they told us that suddenly they had to stop doing things in the way they have been doing for years and had to learn new recipes. They were given no help or time to acquire new knowledge and skills.

In the area of motivation, i.e. competing habits and emotions, as well as unfavourable attitudes and beliefs, we found that children have very strong positive associations with regard to unhealthy food that is often given to children as a reward for good behaviour, accomplishments or hard work. They also said that they did not eat a lot of vegetables or fruit at home, so there were no positive habits at which policymakers could aim while designing intervention. We also found that children like to have a choice when they are offered something to eat. The rapid restriction imposed on that ability to choose has had an effect of psychological reactance. Children interpreted this restriction as a limitation of their freedom, and even those who in general were in favour of healthy food initiatives started to express negative opinions about the new regulation.

Also canteen workers' fear of being fined for incompliant activities resulted in some cases of over compliance, i.e. some canteens stopped using salt and sugar at all (although the regulation permitted the use of small amounts), which in turn had negative impact on children's compliance: they did not accept the "flavorless" soups, sauces, etc. It was visible during ethnographical observations in canteens: younger children were simply leaving a large part of those meals that were newly introduced, and the less salty, less sweet flavours of those were new to children's palates. As a result,

their attitudes towards changes in canteens were increasingly negative. The collected material did not point out any physical capabilities a lack of which would somehow restrict the ability of the average pupil to eat healthily. Disabilities and food allergies were not included in the analysis.

The third component we examined was opportunity, i.e. unfavourable facilities, deficient rules and feedback, and unfavourable social environment.

None of the potential social environment impacts on eating habits have been addressed. Firstly, the family action situation was excluded from the scope of the policy. Secondly, the peer effects, the way young people socialise and how that relates to food consumption, was also ignored. Thirdly, the policy did not address the issues related to traditional and new media discourses and communication practices around unhealthy/healthy eating. The regulation banned the promotion of sweet/fatty/salty foods in school, but at the same time did nothing to the broader regulations regarding advertising of food in Poland. As a result, immediately after leaving school, within which promotion and selling of salty crisps and sweet drinks was banned, children saw billboards and other outdoor commercials with the most famous football players with the pack of crisps in one hand and bottle of Coke in the other.

Nothing has been done to use leverage points (Weaver 2015), e.g. the evolving trends in healthy lifestyle blogs or the Instagram activity of pop-stars showing how visually attractive and tasty healthy eating could be. We can clearly see how many gaps in compliance were not addressed or even acknowledged. That substantially decreased the probability of the effectiveness of the intervention.

Moreover, the policy did not include any tools to support canteen operators and their staff in following the new food checklists and rules for meal preparation. As a result, the media reported cases of canteens operators closing their business because of the presupposition that the introduced changes would decrease revenues (higher prices

of healthy snacks and lower marketing attraction) and make the business difficult to manage (maintaining fresh products, establishing new supply chains, etc) and more risky (possible fines for not following new rules).

Conclusions

This article puts forward a framework helping policy designers to operate as behaviour architects: investigating and addressing the complex patterns of factors that shape the behaviour of policy subjects, and result in policy non-compliance.

We have argued that there are three key elements of such a framework: (1) articulating the overall theory of change that underlies the given policy; (2) framing the policy issue in behavioural terms, describing who should behave how and in what context (including a detailed mapping of stakeholders); and (3) investigating gaps or barriers to compliance in targets' capacity, motivation and/or opportunity. This procedure brings together individual and environmental determinants of behaviour, which could prevent policy practitioners from cognitive "tunnelling" on only selected behavioural gaps during the policy design phase (Weaver, 2015, p. 807).

Trial application of the framework for analysis of real policy (the Polish regulations changing the eating habits of school children) proved its utility. Firstly, the framework made it possible to show how oversimplified and unrealistic assumptions were made about the causal inference between the public regulation, policy addressees' responses, and the ultimate societal impact.

Secondly, the framework made possible the identification of three key action situations in which desired behaviour could take place and be informed, and that only one (school action situation) had been addressed by policymakers, which minimised the possible effectiveness of the regulation.

Thirdly, the framework systematised insights about essential capacities (individual attributes) of policy targets and their motivations and opportunities (resources, institutional arrangements,

and social environment) that could be used either as leverage points to increase compliance or as sources of problems (barriers to compliance). When policymakers or evaluators use such a "map to behaviour" they increase chances of the policy, regulation, program or project being effective by considering a spectrum of accompanying measures. As such, this framework helps them to think outside of the box and to create more realistic policies.

The application of the framework in the case study analysis also made it possible to identify three broad issues requiring further elaboration. Firstly, more conceptual work is needed to organise thinking about elements that can manifest themselves differently in different action situations on different levels. Thus the multidimensionality of action situations and the impact thereof on targets' behaviour needs to be addressed more comprehensively.

Secondly, more work is needed on dynamic elements of the action situations (when one element influence another). Different elements interact within action situations, and those interactions are vital to understanding the whole mechanism leading to an outcome (behaviour). In the current situation, the framework focuses more on static elements, the dynamic is still to be addressed.

Thirdly, the initial analysis showed the framework to be fully operational and easily applicable to policy analysis, especially for practitioners, needing to be enriched with sets of detailed questions tied to each element of the framework. The building of the catalogue of questions could be then followed by an indication of which research designs could be used to investigate each of the described phenomena.

Despite current limitations, we hope that presented framework for behaviour architects would enable policy designers to understand behavioural mechanisms of policy addressees better, and ultimately to create more effective policies

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