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Applied Behavior Sciences to Improve Mental Health Interventions: Biographical Review and Intervention Proposal

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CHAPTER ONE: WHAT IS APPLIED BEHAVIORAL SCIENCE

Behavioral science is defined as a discipline that combines different fields to create and test theories using scientific methods to understand behavior. Applied behavioral science (ABS), is the main lens for this thesis, as it is the use of behavioral insights to intervene in real problems (e.g., global warming, elimination of unhealthy habits, reprioritizing investments). Firstly, ABS does a conscientious evaluation of how the decision-making process is carried out to understand why a person or a group of people act the way they do; in a second instance, proposes a solution by generating a diagnosis of the situation and designing a reliable intervention or adjusting a current one; lastly, but key to the process, rigorously evaluate its effects, which can make the process restart (Hallsworth, 2023).

In the interest of designing policies for Humans and not Econs, or unbiased people who act perfectly as forecasted (Thaler & Sunstein, 2021) behavioral design must be the best approach (Barrows, Dabney, Hayes, & Rosenberg, 2018). Behavioral design is the combination of ABS and impact evaluation, the first one, allows the understanding of the mechanism for decision-making and behavior based on different fields (i.e., psychology, neuroscience, economy). And the latter, emphasizes the importance of rigorous and systematic measurement of the intervention impact as it empirically determines if the desired effect was reached, allowing corrections or ongoing enhancements to be done if necessary. Moreover, using validatory methods grants the upselling and replication of the research and the strategies, especially during efforts to expand and apply them to diverse, often larger, populations.

The power of this disciplinary interaction relies on the deep reading of the myriad of elements in the context that leads to choice, even counter-intuitively. Behavioral design is fundamental to identifying and creating interventions effective in specific situations, plus, it assists intervention design that has a significative impact. Hence, understanding context-driven information enables behavioral designers to shape interventions using insights that trigger desired reactions. Applying this behavioral lens can enhance the design of diverse interventions, ensuring they are applicable for real-world effectiveness (Barrows, et al., 2018).

Both private sectors and public sectors have appealed to ABS knowledge as it can respond to non-linear, complex problems that emerge from the interaction of a variety of factors. For instance, poverty, cannot be solved merely by giving money to those in need as it is a result of diverse social, cultural, contextual, environmental, and educational natures (Singer, 2009). ABS must be in the position to recognize "leverage points" where a specific "shift behavior will produce wider system effects" (Hallsworth, 2023, p.313) so further on in the process it can interfere with the frequency of the actions that generate these collective points. The behavioral range can either be reduced or increased depending on the need using diverse principles and tactics such as heuristics or nudges.

The traditional definition of *nudge* is a gentle push. According to the authors who coined the concept, the objective of nudging is to "help people make the choices that they would have made if they had paid full attention and possessed complete information, unlimited cognitive ability, and complete self-control" (Thaler & Sunstein, 2021, p.7). Behavior change can be complex especially when the decision-making requires attention, when the decision-making is complex, when it is difficult to translate a complex task into

simple steps, when there is a lack of immediate feedback, or when it implies unfamiliar situations. The term *snudge* means a nudge designed by oneself to obtain a desired behavior. People can alter the choice architecture to overcome self-control challenges and align with their long-term goals, helping mitigate impulsive, or undesired choices. Nevertheless, in nudging or snudging *sludge* can be present. This means that elements in the choice architecture can create difficulties in the decision-making process making it harder to display the desired behavior (Thaler & Sunstein, 2021).

The authors wrote: "If you want to encourage some behavior, figure out why people aren't doing it already, and eliminate the barriers that are standing in their way. If you want people to obtain a driver's license or get vaccinated, make it simple for them, above all by increasing convenience" (Thaler & Sunstein, 2021, p.151), which means wicked problems in health, including in mental health, can be address under this theoretical framework. By using ABS and nudging, choice architects can use standardized ways to measure unhealthy behaviors immersed in their contexts, understand how unhealthy choices are structured, design interventions that help people learn to make decisions that promote health care and well-being, and thoroughly evaluate and report findings.

Health, especially physical, has been greatly studied for centuries but has been greatly defined by the occidental perspective, until not so long ago, as the absence of illness. Nonetheless, after the Second World War, the Constitution of the World Health Organization (1948) defined health as a state of complete physical, mental, and social well-being, which requires not only actions to cure the disease but actions to prevent it from occurring and to promote well-being. According to Kobau, Seligman, Peterson, Diener, Zack, Chapman, and Thompson (2011) mental health promotion is understood as promoting abilities and

resources to individuals and groups to increase their quality of life and keep mental illness from continuing. To reach this objective, the authors mention several strategies including "implementing health-enhancing public policy (employment opportunities, anti-discriminatory laws), creating supportive environments (parenting interventions), strengthening community action (participatory research, media campaigns), developing personal skills (resilience), and reorienting health services (postpartum depression screening) to enhance health" (p.1). Understanding the decision-making process, the context, including social expectations, where people make the decisions, and the perspectives that give meaning to the actions can favorably influence the design of interventions that generate actions leading to well-being. Under this train of thought, it could be said that well-being, as broad as a concept as it is, can be approached under the ABS lens to generate interventions that maximize mental health in diverse contexts (e.g., clinical, organizational, and social).

The first concept coined by ABS worth highlighting to understand the decision-making process is *automatic thinking*. Daniel Kahneman (2011) introduced the notion of two brain systems that control actions. Contrary to how the economic models structure decisions they are not always a consequence of a rational, well-considered, calm process which results in the unaware creation of complex sequences of ideas that affect judgment and behavior. As Homo Sapiens we tend to respond to situations unconsciously basis, this realization is fundamental for designing interventions that are effective for Humans and not only for Econs (see Thaler & Sunstein, 2021). This mode of thought is named System 1 or automatic thinking, characterized by being fast, reactive, effortless, and associative. Contrary to System 2 described as a slow, rational, reflective, and effortful process of thought (Kahneman, 2011).

System 1 reacts to simplify decision-making based on the standardized knowledge gathered. In other words, the brain has collected data since before birth necessary to guarantee survival, this data is categorized to later be used as default to generate behavior without the need to ponder on every decision, as it is cognitively demanding. Ergo, in the aim to save cognitive energy, the information that is not processed is replaced with associations and beliefs prior to learning, *a bias*. In statistics, a bias is defined, by Oxford Languages, as a systematic distortion of a statistical result due to a factor not allowed for in its derivation. In this sense, the biases create a corniche from which reality is perceived interpreted, and acted on (see Kahneman and Tversky, 2000). System 1 is influenced by the relevance of the information, the accessibility, and how it is weighted in the situation as it is not always compared or anchored in the same way. The framing and anchoring can be associated with the default option, the number of the options, its labels, the orders in which they are presented, connections between them if present, and the salience of relevant (social) norms (World Bank, 2015).

In case of emergency, when overflowed by stimuli, or when buying yogurt at the supermarket, System 1 is very convenient, nonetheless, acting on autopilot might have complications when life-changing decisions must be made. As the data is being filtered by a very broad screening, relevant information can be neglected if it does not stand out from other blocks of information. As a result, humans can make ignorant decisions, as to the fact that it is made disregarding losses or gains the decision might cause. Here is when System 2 should be activated. The rational, deliberative system must control the impulses of the automatic responses to guarantee an effective result and reduce the intention-behavior gap (see Sheeran & Webb, 2016), however, it has a limited capacity.

Per Thaler & Sunstein (2021), architecture design that neglects system 1 activation or relies only on this type of process is the ideal scenario for nudging. Situations where there is a temporal gap between making a choice and experiencing its consequences increase the friction to display a desired behavior. As the immediate rewards or consequences of a decision are not apparent or are delayed, individuals may find it harder to resist immediate gratification or make choices aligned with their long-term goals. Likewise, in situations where the outcomes or impacts of a decision are unclear or not well understood, people may find it more challenging to exercise self-control. As the lack of predictability decreases the perceived value of having a wide array of choices or the autonomy to decide for themselves does as well. In consequence, the lack of information about the consequences can contribute to impulsive and inefficient decision-making.

However, the speed and quality of the thought process are not the only factors correlated in the process of decision-making. As a gregarious species, community and social interaction play a crucial role. Social norms, social status, and social roles facilitate behavior that responds to the expectations of the ingroup. Our behavior, cognition, and emotion are permeated by the interaction with others, as well, we are hardwired to cooperate to obtain goals and fulfill our needs. Belonging to social groups satisfies the human need for affection, offers important resources for belonging, improves self-esteem, gives the power to control fate and safety, gives guidelines to understand themselves and their environment, and allows a better definition to others on how to understand the individual. Personal identity is shaped by feelings and actions which might be as well shaped by the comparison of what people believe is unique, only in differentiation to others. As a result, mental models are often shared due to human sociality which “affects decision-making and behavior and has important

consequences for development" (World Bank, 2015, p.42) and can create collective behavioral patterns.

According to Tajfel (1978), self-concept derives from knowledge of the membership of social groups and the entourage of the in-group (e.g., values, beliefs, actions, prejudices). Social identity is defined as part of self-concept which derives from the knowledge and emotional significance of the members of a social group. The social concept is the identity shared with others of the same group. Being a loop process in constant feedback. Behavior and attitudes can be placed into the spectrum of two poles- interpersonal and intergroup- the first one refers only to individual characteristics saliency in the identity, while the second is defined as the dominance of group membership. If social networks, which are groups of individuals and bonds that determine social experience intervene in decision-making as much as social reward and recognition it is fundamental to recognize the repercussion of social thinking, as ABS does.

From the combination of fast thinking and the impact of social thinking emerge, *mental models*, understood as individual explanations of how the world operates based on societal worldviews and cultural influences. Mental models have a major impact on choices and behaviors. These interpretations are formed unconsciously and rise through shared experience, generating the impression of responding to stimuli rationally, when in fact copies prior beliefs and attitudes nurtured by the culture (World Bank, 2015). Particularly in the context of mental well-being, this information can shed light on the structure of healthy and unhealthy behavior, as rationally healthful actions should be the norm but is not. ABS facilitates the understanding of the mechanism of human actions, to base the design of well-being prompting interventions in the health sector where information access, bureaucratic

processes, and social models negatively influence decision-making and therefore individual's quality of life. ABS grants the possibility to research for low-cost successful actions, whether there are already established but failing programs or innovative plans. It also permits the comprehension of the complexity of the challenges as it embraces diverse principles and disciplines necessary to approach the systemic factors that determine mental well-being. Finally, ABS multi-armed interventions (World Bank, 2015) are powerful as it is based on the loop of the scientific method where first the problem is defined a diagnosis is generated to further design the intervention, implement it, and evaluate it so there can be a re-definition and a re-diagnose.

Notwithstanding, ABS has several critics. According to a recently published article "A manifesto for applying behavioural science" there are four key elements to improve its application. A critical element in the ABS process is the evaluation of the effectiveness of the intervention, using quasi-experimental designs reduces the reliability of the information and increases the possibility of type I or type II errors. Therefore, the author highlights the crucial role of randomization. Randomized Control Trial (RCT) guarantees the experimental design crucial for the scientific method. Hallsworth (2023) mentions two-stage trial protocols, evolutionary RCTs, sequential multiple assignment randomized trials, and 'bandit' algorithms to counteract this problem. On the same line of thought, as multilayered systems must be understood to intervene in wicked problems participants and stimuli must respond to the reality faced, hence, multi-site and multi-studies are recommended so the data is reliable and valid. Thirdly, the theoretical approach must be robust and interconnected to be able to answer the mechanism of decision-making beyond a plain enumeration of cognitive biases. Lastly, beneficial to reduce hindsight bias, the paper suggests behavioral science to

predict the result of the experiment and analyze the prediction under the light of the data collected, this can be done with experimental design protocols.

To examine into the core of Applied Behavioral Science (ABS) and navigate how to effectively impact on mental health interventions, this master's thesis embarks on a journey across four chapters. Chapter One presented the definition of key terms and concepts crucial to understanding what ABS is. Chapter Two will meticulously lay the foundation for designing a general structure for the developing ABS interventions, Define > Diagnose > Design > Test > Scale process, by exploring frameworks, toolkits, and methodologies that underpin the practical implementation of behavioral principles. Following this, Chapter Three explores real-world ABS interventions in the mental health sector to face well-being challenges, understanding the mechanism for their successes and shortcomings. Chapter Four pivots towards a prospective stance, it proposes an ABS-drive intervention aimed at addressing the mental health challenges faced by immigrants seeking for the Permesso di Soggiorno in Italy. This thesis intents to bridge the gap between theory and practice, offering a structured solution to enhance mental wellbeing.

The analysis of real-world ABS interventions underscores the need for a more systematic approach to research, prompting us to propose a structured solution. For so, complementing these chapters are two annexes. Annex 1 comprises a toolkit that integrates the different methodologies used by leading ABS teams. It serves as a visual synthesis of the stages presented in Chapter Two. Annex 2 addresses a critical factor for ABS interventions, bias and tactics. A glossary has been compiled, containing the key elements identified as effective for behavioral intervention through the theoretical review.

CHAPTER TWO: APPLIED BEHAVIORAL SCIENCE STAGES

The Organization for Economic Cooperation and Development (OECD) has designed a toolkit to apply behavioral insights (BI). They define BI as useful information to identify how the decision-making process is affected by the context (Hansen, 2019). As mentioned before, ABS ensures the effectiveness of the intervention design as it understands the myriad of factors and levels that intervene in the decision-making process. By doing so, the researcher can understand real behavioral drivers instead of theoretical assumptions of Econ-responses, which in many cases guides intervention design. The BASIC toolkit, a theoretical-practical guide published by the OECD to guide the development of intervention guided by the ABS approach, has as its main scope to address public policy problems, nonetheless, the rationale and processes can be applied in countless contexts and research. BASIC follows five stages and several substages to delineate ABS projects: *B*ehavior, *A*nalysis, *S*trategy, *I*ntervention, and *C*hange; hence the acronym (Hansen, 2019).

The first stage, "*B*", asks the researcher to analyze and focus on the key behavioral elements that cause or are related to the problem. As in most research, the first step at the outset of the process is defining all the stakeholders' behavioral repertoire relevant to the problem in detail. The Behavioral Reduction Tool might come in handy to list the operationalized actions, identify the relevant areas where the problem is being nested, and classify the strategic domains. Once the actions have been understood, the behaviors need to be hierarchized based on criteria such as frequency, accessibility, and impact to target them. During the *Behavior* step is compulsory to define the objectives, preferably in a SMART manner, contemplating the type of data that is required, its possible analysis, the availability

of resources, ethical factors, and contextual disposition. The OECD recommends outlining before, during, and after touchpoints for all the stakeholders to potentially identify spots for behavioral intervention. Tools that might be useful for this substage are "behavioural flowcharts, behavioural mapping, user journey mapping, service blueprint" (Hansen, 2019, p.16).

The "*A*" stands for using behavioral science to cognitively and psychologically comprehend the target actions individualized in the previous step. Following Kahneman's (2011) theory on a dual cognitive process, automatic thinking relies on mental shortcuts or rules of thumb to make quick decisions, these are based on previous experiences, heuristics, and biases which are in most cases the reason why complex decision-making fails. The OECD (2019) relies on several theories to tackle the cognitive patterns that contribute to the problem to be solved and proposes four key variables that intervene with the decision-making process. Attention and the consequences of its limits. Believe formation and the biases and heuristics that automatically trigger responses. Choice and the bio, psycho, and social contextual factors that are in interaction. And determination or the capacity to break with the previous variables to make the most efficient action. All together, they respond to the ABCD acronym.

Frequently, information is not salient and clear enough to catch the decision-maker's attention. In addition to this fact, over or underestimation of results, mental shortcuts based on information that confirms beliefs, or any other intuitive judgment that prevents decision-making from being informed affects the likelihood of success of the action following the decision. Moreover, inadequate time and context to execute a choice added to mental taxation, exhaustion, low motivation, low self-regulation or self-control, and low willpower

can induce the choosing of more short-term beneficial action, due to immediate gratifications, even if in the long run might be detrimental to the decision-maker (Hansen, 2019). Behavioral Science plays a fundamental role in the *Analysis* step as choice architecture requires a deep understanding of heuristics, choice bias, nudging techniques, and testing of possible choice mechanisms to use the results to leverage inform decision-making providing processes and tools that support effective judgment and accurate and reliable assessment of outcome probabilities.

The third stage takes into consideration the information gathered and the analysis made in the previous two steps and starts developing strategies, therefore, the "*S*" stands for the development of action plans that promote informed decision-making. By understanding the *Analysis* phase and how biases might easily interfere with the decision-making process on different levels of the process it is easier to intervene on each of the four key factors. The BASIC tool kit recommends the use of nudges and behavioral tools for each one of them.

To begin with, if the decision-making process is disturbed during the acquisition of the information or in other words if the attention is not caught efficiently to be codified and consolidated, then it might be useful to address attention by making the information relevant when the mental state and the timing is right or by making the relevant information highlight with saliency tactics, reminders, or prompts. Also, carelessness in decision-making can be adjusted by setting pre-set or default options. Accepting that inattention is part of the decision-making process guarantees possible human mistakes are contemplated during the intervention design and, hence, addressed and corrected (Hansen, 2019).

On the same train of thought, bias disrupts the evaluation of the consequences as beliefs or attitudes which causes new data to be neglected, especially if it challenges already

established priors. In these cases, it might be useful to make the information as simple as possible to process when presenting it. When asking the audience to analyze the information, it would be useful if the person could navigate the information by searching or filtering aspects. When and if addressing questions, question trees could facilitate the comprehension of the new data. Another way to target the belief formation is by making the information architecture resemble the information structure that people are already used to, this can be applied in terms of the content of the information or the layout, so it resembles the beliefs that constitute the audience's mental models. The intervention should mirror the public's intuition instead of competing with it by adapting heuristics and levering social proof (Hansen, 2019).

Also, the conditioning of the decision might happen if the setting or timing is not correct so behavioral techniques can be used to make the decision more appealing. The OECD (2019) recommends considering motives, targeting different perspectives, and triggering emotions. According to Kahneman, Knetsch, and Thaler (1990) when a loss occurs (i.e., selling a product) a lot more value is perceived to the object than when is gained (i.e., buying the same product), thus, it might be cognitively efficient to catch the audience's attention and frame the decision-making in terms of loss avoidance. As a third resource to design strategies for choice biases, social techniques such as using the sense of community and using social comparison or social identity alliances can leverage to focus on choice (Hansen, 2019).

To address the lack of determination, there might not be enough motivation for the thought of the decision to trigger an action that executes the idea. For this, reducing the level of difficulty in making or executing the decision is fundamental. A way to do this is by giving

guidance on how to implement the action plan to display the decision, especially if it is not contemplated as a plan that must be executed immediately. Likewise, giving feedback increases the chance of resolving the choice. If the plan requires several steps, it should be considered to use strategies that help the audience to carry the task, such as commitment devices, especially those that weigh on social norms.

Once the intervention has been developed and executed it is a fundamental part of the ABS to actively evaluate its effectiveness to reach the outcome expected from the first stages. An assessment must be done as a whole and if possible, with experimental designs for each technique after its mise-en-scene, to adjust as necessary for a long-lasting action. In the fourth stage, *Intervention*, the OECD (2019) proposes a list of 9 steps that are useful for the evaluation of the intervention. Firstly, to determine if the objective has or has not been reached it is critical to define the success of the intervention in terms of measurable variables; the strategies should be piloted in situ with samples that respond to the same characteristics of the audience population; ideally, several research designs should be taken into consideration; additionally, the sample power and size should be established to correctly reject the null hypotheses and reduce error types I and II; as well, the risk of intervention should be calculated; also, it is fundamental to be prudent when assessing timeline and budget; lastly, ethical factors should also be considered during this step as the intervention has to guarantee physical, legal, and ethical security from the methodology, the interaction with the participants, the data analysis, data sharing, and possible publication or other communication methods of the results so it can be replicated, monitored it or scaled.

For the experimental validation, several types of impact evaluation can be proposed. Hegemonically, randomized controlled trials (RCTs) can be used by randomly assigning the

participants to the experimental group (EG) or the control group (CG). This distribution of the bias controls for confounding variables and external factors that increases the internal validity of the experiment, allowing the researcher to understand better the nature of the relation between the intervention and the result (Deaton & Cartwright, 2018). Nonetheless, there are other methods to evaluate what works depending on the research characteristics and the researcher's needs. On one hand, regression discontinuity (RD) can be done by allocating participants either to the EG or the CG, depending on a predefined cut point. By doing so the analysis focuses on the discontinuity of the trends between both groups around the threshold. Using the RD allows the researcher to evaluate the effects of the independent variable in what could be perceived as a more natural context of the correlation or even causal relationship between the manipulated variable and the outcome (Cattaneo & Titiunik, 2022). On the other hand, propensity score matching (PSM) can also be done. This impact evaluation pairs participants to the EG or the CG, depending on their characteristics or the similarity of their scores. By balancing the control variables selection bias is reduced and the measurement accuracy rises, as it mitigates the possibility of a confounding variable being responsible for the outcome, nonetheless, recent studies show this method raises biases, imbalance, and model dependence (King & Nielsen, 2019). A third option, especially useful in observational studies, is the Difference in Differences (DiD) where participants are not randomly assigned to the EG or the CG, the pre-and-post intervention becomes the baseline to estimate the impact of the strategy by analyzing the differences before and after (Goodman-Bacon, 2021).

Finally, the fifth stage according to the BASIC toolkit is the revisiting of the intervention under the scope of the assessment done in the previous step looking to guarantee the maximization of value based on the insights of the experiment. Hansen (2019) presents

some considerations to guide behavioral scientists in the monitoring and maintenance of the project. Firstly, the intervention cannot be efficient if it is not aligned with the political, social, and technological state of the context. Revisiting the project-level alignment enhances the sustainability and effectiveness of the research, as well as ensures that the behavioral interventions remain relevant to the problem and updated, as in most cases, due to its nature, it might evolve as the contextual needs do. It is also important to bear in mind that ABS research intends to design interventions that can be upscaled. This can be achieved by understanding the factors that facilitate or hinder the widespread adoption of behaviorally informed policies in the actual population and enriches the research for other populations where replication can serve as a reference point of intervention for solving similar problems.

After a thorough process followed to deliver an effective, relevant, and well-structured intervention as the BASIC approach proposes it can be convenient to disseminate the knowledge obtained, as widely as possible, so it can help larger populations by influencing the translation of research findings into real-world impact and by fostering a shared understanding of behavioral principles. Hence, diffusion encourages the adoption of evidence-based practices. Nonetheless, if reproduction of the intervention is intended, it implies the task of a constant control of mid and long-term side effects of the intervention, this consideration underscores the ethical responsibility of researchers to protect the well-being of the target.

Applied Behavioral Sciences respond to the logic established by the scientific method, therefore, is it not surprising that large numbers of scholars and institutions design their interventions following a similar logic. The World Bank does an annual publication that provides in-depth analysis and insights into key development issues. Each report focuses on

a specific theme or topic of global significance, offering comprehensive research, data, and policy recommendations. The World Development Report 2015 described a similar outline structure to construct adaptive interventions based on informed decision-making. They enunciate a process of definition and diagnosis; design; implementation and evaluation; and redefinition and rediagnose. For the World Bank (2015) the diagnosis and definition of the problem should analyze the context under the lens of the three principal rules of assumption setting – automatic thinking, social thinking, and mental model thinking- because addressing them facilitates the researcher's task of navigating the decision-making cycle and makes it more effective as the cognitive and psychological errors tend to be on biases and heuristics. Another critical point for this scheme is the consideration that ABS does not focus only on the final consequences of the intervention, but it cares deeply about the process and evaluation of every modification, it is imperative an experimental phase, primary to the final launch and after the implementation, to test for failures and inefficiencies. This process is described as an almost infinite loop given its complex and iterative nature, where the feedback generated on a stage nurtures the redefinition of the following step, which in turn generates changes in the following.

The World Development Report (World Bank, 2015) proposes for each step a series of recommendations to guide the researcher in the complexity of the model. For the diagnosis of the psychological and social obstacles “there may be nothing as illuminating as the technique of dogfooding” (World Bank, 2015, p.195), this approach asks the researcher to face the problem that is being addressed as the target audience for the intervention would. By doing so finding the issues or the factors that hinder informed decision-making is done not only from a theoretical approach but understanding the real-life circumstances. Yet, other

tools and techniques can be applied to understand the context of decision-making. Thick descriptions, such as ethnographies, can be useful as they provide detailed information about the natural setting, cultural nuances, social dynamics, and behavioral patterns that can become useful BI to better understand the elements related to the problem. It is also recommended when using methods such as surveys to measure psychological patterns, to use measurement techniques that can reduce courtesy bias, or the tendency to answer as what is considered to be "expected" or "correct" and not what is believed. In some cases, personal distance framing questions in an indirect tone (i.e., using hypothetical cases or creating vignettes) can help to elicit sensitive information. Also, to measure social behavior stating the social norms to frame the question can normalize the respondent behavior and ease the acquiescence bias or the unwillingness to admit their attitudes or behavior either consciously or subconsciously; for this purpose, using other experimental instruments such as implicit association tests might, as well, help to measure attitudes and social norms.

Regarding the design of the intervention, the World Bank (2015, p.197) presents a table comparing diverse designs with already evaluated intervention effectiveness, based on paper evidence, in a myriad of problems in terms of the intervention executed and the potential obstacles; it is also possible to read examples of each design. In summary, the techniques that have proven to work efficiently in increasing informed decision-making are feedback; channel and hassle factors; micro-incentives; identity cues and identity priming; social proof; physical environment cues; anchoring; default rules and automatization; loss aversion; and public/private commitments.

Like the OECD (2019), the World Bank (2015) emphasizes the importance of experimenting with different models of implementation, to have evidence of each component

of the intervention being carried out. Prominence should be given to the frequent use of ABS to solve complex problems, hence, if the comprehension of them is done considering independent solutions the theoretical examination could throw positive results but when applied and in interaction with real-life context the outcome might not be as expected. By experimenting, correlation or causality can be established more accurately which favors real-time adjustment and optimization of behavioral interventions. Moreover, optimizing the process of strategy refinement, which as previously mentioned, is one of the fundamental steps in ABS structures. It helps the intervention to stay updated and contributes to the generalizability and transferability of the insights mined after the solution implementation process.

Then, as the last stage, the information collected from the evaluation needs to be applied for the revision of the intervention, for so, the research and development (R&D) needs to be continued. The World Bank (2015) emphasized not only the structural process that must be constantly reviewed but also the biases and heuristics that might arise inside the team that oversees the intervention. The automatic, social, and mental model obstacles might arise and interfere with the learning and diagnosis, which in the long run affects the adaptation of the intervention. For so "organizations may need to change their incentive structure, budget processes, and institutional culture" (World Bank, 2015, p.199) Additionally, from a cognitive and psychological perspective this final step presents two main despondency factors. The first one is the discouragement that can be caused by the lack of immediate gains and the second is the frustration that might arise as during experimenting and reevaluation setbacks and errors might come to the surface. To tackle these issues plans to maintain motivation - such as creating small tasks to achieve bigger goals, maintaining

small wins as reinforcement, or frequent reminders of how identifying problems and mistakes inside of the design is fundamental to maintaining the developmental process- must be activated.

The Behavioral Inside Team (BIT), a government-backed organization that uses ABS to enhance policymaking designing strategies for informed decision-making, has published two toolkits in the past decade to implement decision-making. The insights gathered from their research findings on how people think and act, as well as the outcomes of their intervention to improve public services have allowed them to create the MINDSPACE (2010) and the EAST (2014) framework. The BI Team Cabinet Office published MINDSPACE (2010) as a scheme to address wicked problems such as security, health, and environmental issues. This toolkit proposed nine non-coercive ways to modify behavior. By considering the messenger; the incentives; the norms; the defaults; the salience; the priming; the affect; the commitment; and the ego the BI Team believed it to be possible to design more effective public policy interventions, in a way that was defined as "low cost, low pain ways of "nudging" citizens - or ourselves - into new ways of acting by going with the grain of how we think and act" (p.7).

Later in 2012, the BI Team started the development of the EAST framework, after theoretical and empirical evidence demonstrated keeping track of all five elements was cognitively feeble and, in some cases, even ineffective. Thus, they grouped the information in smaller units to the memory and processing effectiveness. The current four pillars of this approach are Make it Easy, Attractive, Social, and Timely, hence the acronym. However, the methodology is only contextualized when immersed in an ABS structure, similar to the

OECD (2019) and the World Bank (2015) architecture of intervention. The BI Team utilizes four stages to develop informed decision-making policies.

The first stage of the EAST framework is the outcome definition. The main question is "What are we trying to achieve" (BI Team, 2014, p.45) and for such a task, the researcher is asked to identify the behaviors that must be addressed, the best way to measure them, the best type of data to be collected, quantify the ideal change in behavior, and design the intervention objectives and timeframes. Understanding the context comes next, for this second step, the researcher needs to comprehend the target audience and the background strengths and opportunities, to analyze the condition that facilitates the emergence of the behavior identified in the previous phase and all the factors that interact with it. The BI Team (2014) highlights research must be conducted both from the practical and theoretical perspective, in other words, researchers need to experience the audience perspective to guarantee an intervention design grounded in a real-life context. The main recommendation is to co-design the intervention with the target and other expert organizations and to achieve it the antecedents and behaviors must be done together.

The intervention is built and implemented in the third step, according to the BI Team (2014). The aim is to make it as strategic and practical as possible, for this, the guiding question for this step is "How could we make this action as easy as possible?" (p.47). The MINDSPACE and the EAST frameworks were designed as guiding tools for the intervention design phase. Lastly, as stated several times before, as a final stage it is fundamental to test the new interventions and their effect on the context, test acceptability, and cost-effectiveness to adapt the strategies based on the insights. RCTs are suggested by the BI Team (2014) to be the most efficient evaluation method as having the randomly assigned control group

assures the reliability of the evaluation and reduces several problems that can arise from confounding variables. However, the research team also advocates for evaluation methods that involve field observation and co-evaluations with the target audience. In contrast to the OECD (2019) and the World Bank (2015) the BI Team (2014) brings to light three major matters for ABS: replication; segmentation; and complexity. Evaluating the intervention does not only imply conducting singular experiments with singular samples, au contraire, the researcher needs to assess if the strategies' effects differ if the settings and targets are modified and if the intervention on a "simple" problematic behavior reacts differently from the intervention on more complex behaviors.

As aforementioned, The *EAST Four simple ways to apply behavioural insights* (2014) reports a detailed list of ABS tactics for the intervention. Each of the four dimensions – easy, attractive, social, and timely – responds to bias that affects decision-making. Regarding the *Make it easy* or the importance of reducing the cognitive energy or the "friction cost" to increase the possibility of adopting a decision, the authors recommend three main techniques. As the first one, the BI Team levers on the impact that default options have in decision-making. When making an uninformed decision the pre-set option is generally the one that prevails, which means the default option might tend to be the chosen. A critical element to be considered if using this type of option is giving the audience the possibility of changing it and opting out. In the second place, it is suggested to reduce what they call the "hassle factor" (BI Team, 2014, p.12) or the motorial effort or the struggle to execute an action to increase the response rates. Finally, simplification is key, in terms of the communication level and of the quantity and complexity of actions needed to obtain the goal, for so, according to the report it can be useful to introduce the takeaway message early on in the interaction; use

simple and adequate language for the target audience; when presenting an action plan or a set of steps to reach on objective be precise; give one reference point to reach out to for any responses or questions; and maintain only relevant information for the decision-making.

Concerning the *Make it attractive* the BI Team (2014) suggested two elements. In one respect, use sensorial elements (i.e., images, colors, particular sounds) to draw attention toward the information that enhances informed decision-making or emphasizes the consequences of the behavior. Furthermore, personalization or custom-made messages attract attention faster, and more efficiently and increase engagement which at the same time upsurges the probability of recall and the possibility of generating an action. Secondly, the use of incentives is also advised to draw attention. In most cases financial incentives are the primary choice, nevertheless, the BI Team (2014) identified other techniques to reward or sanction behavior with similar levels of effectiveness and even lower impact (i.e., no reduction of the intrinsic motivation) such as lotteries; accentuate the shortage or scarcity of the consequence of the conduct -if it regards a product or a service; relate the behavior to self-images; and gamify activities.

The *Make it social* dimension was designed to benefit from the effect of the group's influence on decision-making. Similar to the previous factor, the authors described 3 practical tactics for the intervention design. As the first one, the BI Team proposed to air the desired behavior as the normal social behavior. Descriptive social norms raise awareness over the actions others are doing, being useful in ABS as the default ingroup behavior is most likely to be enacted and accepted, hence, it increases the probability of being adopted by the target audience if it is perceived as the prevalent. Simultaneously, the use of networks can be useful to socially model decision-making as it facilitates the flow of information which shapes the

relationship interaction as social and individual actions. Therefore, networks can promote actions that reinforce collaborative efforts and model behavior among peers based on reciprocity and mutual support. Lastly, research has shown the effect of commitment devices on behavior. It is known the constraints that might ascent when transforming an intention into an action by committing the action to someone else increases the cost of failure which motivates the execution of the behavior (BI Team, 2014).

The fourth dimension is to *Make it timely,* as the responsiveness to an interaction might be diverse depending on the ideas, people, and circumstances around. Consequently, a technique to make interventions timely is to prompt people during circumstances that favor receptivity like major life events when habits are already being altered. The example used by the BI Team (2014) is the propensity to change during transition periods such as marriage, loss of a relative, or arrival of children. By no means does this intend that any other time is unapproachable, on the contrary, deliberately testing on timing can even throw results on the time and hour of the week to intervene with higher rates of success. A second tactic is contemplating immediate costs and benefits. This implies two considerations. On one hand, if the desired behavior presents a direct and immediate incentive that is most likely to be enacted, attention must be drawn to it; even if the gratification is present but delayed the response might differ. On the other, contrary to the benefits, the presence of any type of cost (i.e., financial, physical, cognitive, emotional) might reduce the desired behavior. A last tactic proposed by the BI Team (2014) is to "plan their response to events" (p.6). When complex actions are required, it is highly beneficial to deconstruct them into simpler actions. A sequence of easy, concrete, and achievable steps can become an effective action plan. Additionally, by identifying barriers and opportunities that can emerge during the execution

of the action desired to intensify it is possible to plan how to overcome them, avoid them, or take advantage of them. Finally, as a research team, understanding patterns of the objectives that are being set for the same goal and common barriers can help structure "default" action plans that the target audience can use as an automatic path to reach the individual goal or as an example or guidance to overcome the obstacles.

Ideas42 is a non-profit behavioral design lab and uses ABS to address social challenges. Their objective is to improve the effectiveness of social programs by designing interventions informed by behavioral insights. Ideas42 started as a small office in Harvard University and to the date collaborates with governments, foundations, NGOs, and private companies to implement evidence-based strategies that positively impact behavior and decision-making. It is not a surprise their theoretical frame and methodology are akin to the OECD, the World Bank, and the BI Team. According to Barrows, Dabney, Hayes, and Rosenberg's report, published in 2018 titled *Behavioral Design Teams: A Model for Integrating Behavioral Design in City Government*, Ideas42 merges theories from fields such as psychology, neuroscience, and behavioral economics to understand and intervene on human choice and action. In their words "when behavioral science is combined with impact evaluation—the use of rigorous methods to understand the effectiveness of policies and programs—BDTs (Behavioral Design Teams) are able to rapidly iterate and design improvements that account for how people actually behave, rather than how we think they should" (Barrows et al., 2018, p.2).

Barrows et al. (2018) state decision-making and behavior are affected by the synergy between contextual factors, target audience characteristics (i.e., values), and behavior characteristics (i.e., cost and benefits). So to understand the limitations it is necessary to do

a thorough investigation on how the real environment is molding choices and actions. Once this is done, according to Ideas42 research and experience, in most of the cases to drive decision-making and behavior is fundamental to increase awareness, facilitate information, present incentives create channels to stimulate intention and facilitate the execution of the behavior, and reduce barriers that increase inaction. However, to comprehend each context, target audience, and behavioral characteristics Ideas42 has traced a behavioral design process very much similar to the ones previously outlined.

The first stage is to define the problem. For Barrows et al. (2018) the fundamental aspect of this step is to eliminate priors or preconceptions about the issue at hand and to understand the real-world context in which it emerges. Once the bases of context have been cleared, the behavioral elements of the problems must be understood. In their own words, "we try to connect elements of the physical or psychological environment. Unlike some research that asks a lot of "why" questions, our approach asks "how" questions." (p.31). To do so Ideas42 makes use of *Behavioral Mapping* or the identification of specific psychological or environmental "points" or elements for decisions and actions within a process. The third step entails addressing the problems identified during the diagnosis. According to the authors, the intervention must also delineate execution details such as timeline, resources, and potential to escalate the intervention. For the testing phase, the gold standard is the RCT to evaluate the efficiency of the intervention, nonetheless, if due to the context and experimental design cannot be held, then, a quasi-experimental design such as DiD can be conducted. Lastly, when an effective intervention has been executed, based on the previous single testing, the research team should search for further opportunities to replicate the intervention in similar contexts or larger-scale populations. A few questions are

mentioned by Barrows et al. (2018) to guide the scaling and improving process: “Are there subgroups for whom the intervention didn’t work as well? Are the positive findings lumped in one neighborhood or demographic? Is there a cheaper way to execute your design?” (p.34). This would conclude the standard Define > Diagnose > Design > Test > Scale process.

However, the added value of the Ideas42 toolkit is the in-depth description of the design of the Behavioral Design Team (BDT), an element neglected in prior protocols. The first step should be to identify a well-connected, high-level official(s) who possesses the readiness, capability, and influence to raise awareness and excitement for the BDT to lead and coordinate the team; fundamental for project endorsement and long-term success in the ABS process implementation. Upon accomplishing this, for a BDT to be conductive is fundamental to find stakeholders and guarantee funding. The location must be considered strategically as the access, authority, and agility for the BDT to intervene depends on it. Access can be obtained with robust connections and a strong presence citywide, as it proves valuable for publicity, introduction-making, and relationship-building. Per Barrows et al. (2018) authority is key to pressure if needed, but in general to establish a strategic agenda and create space for risk. For agility, the BDT must guarantee efficiency in execution, task prioritization, agility, quick decision-making capabilities, collaboration with other entities, and security and allocation of funding. Afterward, a multidisciplinary team should be assembled covering the main ABS areas (i.e., psychology, economy, management, public policy) and ideally with the experience to plan and execute the interventions and a posteriori evaluate its efficiency (Barrows, et al., 2018).

If the BDT is completely new, once the team is defined, profiling is needed to understand the skills, expertise, and availability of the members, so managerial decisions can

be made, in an effort to effectively contribute to the project's goals and objectives. Firstly, the capacity range of the BDT in terms of the number of projects that can held simultaneously; the type of projects to invest in time, energy, and general resources; and how to sequence the tasks to obtain the project objectives. Then, network building should be prioritized. ABS requires, as aforementioned, an understanding of a myriad of fields to understand all the issue's edges, plus target users, and field experts (i.e., partners, allied organizations, and community leaders). In pursuit of this 360-view having efficient and high-quality alliances is fundamental. Finally, to establish an ABS project, it is key to delineate operational processes. This can be done by deciding the composition of a project team, the specified roles, the responsibilities, the mix of skills required, the duration of individual assignments within the project, and the distribution of resources. Moreover, establish a hierarchy of responsibilities, by outlining the lines of authority and reporting relationships, stating who is accountable for specific tasks, decisions, or outcomes. It is also fundamental for the successful implementation and management of ABS projects to implement robust procedures for both the execution and evaluation of the process and to structure a valuational method to choose and prioritize projects, considering relevant criteria and objectives (Barrows et al. 2018).

Connected to the former element, Ideas42 presents five guidelines for the BDT to choose the right ABS projects. The first one regards local impact. Precedence should be given to initiatives that prioritize the base-city or local context concerns, especially to those projects with the most significant potential for influence. The second one regards strategic alliance requirements. Projects must be chosen when they require collaboration with organizations that possess both the capacity and willingness to oversee projects and implement

modifications. The third selection criterion concerns the capacity to interact with the target audience. It is recommended to ensure the BDT, or the co-designers of the project and intervention, have clear touchpoints with the community involved with the ABS process (i.e., in-person interactions, online communication, social media). The fifth element of interest is data gathering, it must be guaranteed access to data that can be used to generate insights into the outcome. Whenever feasible, Ideas42 recommended using existing data sources, nonetheless, causal research can be conducted to gather primary data. Finally, the authors suggest participating in projects where large samples can be recruited and RCTs can be done to evaluate the impact of the ABS intervention. These are to detect outcome differences and increase the level of statistical confidence. To determine the sample power, it is possible to use Minimum Detectable Effect calculators (Barrows, et al. 2018).

CHAPTER THREE: APPLIED BEHAVIORAL SCIENCE IN MENTAL HEALTH INTERVENTIONS

Mental health issues have critical consequences at both individual and societal levels. Lost productivity, increased healthcare costs, and the economic burden of disability associated with mental health conditions contribute to substantial economic costs globally. According to the World Health Organization (2022), depression stands as one of the primary disability causes, while suicide ranks as the fourth factor leading to mortality in the 15-29 age group. In the words of the WHO "Many mental health conditions can be effectively treated at relatively low cost, yet the gap between people needing care and those with access to care remains substantial. Effective treatment coverage remains extremely low". The Lancet Commission on Global Mental Health and Sustainable Development (2018) emphasizes the economic case for investing in mental health to achieve overall sustainable development. Mental health is integral to achieving several SDGs, including those related to health, well-being, poverty reduction, and social justice. Mayor events in recent years such as the pandemic, conflicts, and natural disasters have had profound effects on global mental health. The global response to public health emergencies needs to encompass mental health considerations to address the psychological impact on affected populations and promote building resilient and sustainable communities.

To address the pressing mental health needs, the most widespread technique worldwide is psychoeducation (Dumesnil & Verger, 2009). The concept of health literacy (HL) first appeared in literature in 1974 and was introduced by Robert J. Simonds in a paper titled Health Education as Social Policy. The author used this term to describe the skills

necessary for individuals to understand and act on health information. Later in 1986, Brian Nutbeam expanded on the concept in his article Health Promotion Glossary. In a more modern version of the paper Nutbeam and Muscat (2021) defined health literacy as " personal knowledge and competencies which accumulate through daily activities, social interactions and across generations. Personal knowledge and competencies are mediated by the organizational structures and availability of resources which enable people to access, understand, appraise, and use information and services in ways which promote and maintain good health and wellbeing for themselves and those around them." (p.5). Kanj and Mitic (2019) divided the Health Literature into a model composed of three domains. Functional HL which regards the generic skills people use within the healthcare contexts; conceptual HL which references the skills in social; and empowerment HL, which are the skills to develop the healthcare environment in social and political contexts. These early works laid the foundation for the development and recognition of health literacy as a critical component of public health and healthcare. Since then, the concept has gained attention, leading to further research, policy development, and interventions aimed at improving health literacy worldwide.

However, the concept of mental health literacy (MHL) emerged later than ML literacy and only gained attention in the 21st century. One of the earliest references to the MHL can be traced back to the work of Jorm, Korten, Jacomb, Christensen, Rodgers, and Pollitt in the article "Mental Health Literacy: A Survey of the Public's Ability to Recognize Mental Disorders and their Beliefs about the Effectiveness of Treatment," published in 1997 in the Australian and New Zealand Journal of Psychiatry. Kutcher, Wei, and Coniglio presented in their paper “Mental Health Literacy: Past, Present, and Future” the definition of MHL as

comprehending ways to attain and sustain positive mental well-being; understanding mental disorders and how to treat them; reducing the stigma associated with mental disorders; and boosting the effectiveness of seeking assistance, referring to knowing when and where to seek help and cultivating skills aimed at enhancing one's mental healthcare and self-management capabilities (Kutcher, Wei, & Coniglio, 2016). However, there are no particular strategies, tactics, guidelines, or action plans on how to effectively achieve HML.

In 2014, Hadlaczky, Hökby, Mkrtchian, Carli, and Wasserman conducted a meta-analysis searching on PubMed, PsycINFO, Cochrane Library, and Google Scholar for peer-reviewed articles related to standardized psychoeducation methods interventions. Fifteen studies reported similar tools, assessment criteria, and data analysis, all related to Mental Health First Aid (MHFA), a training program designed to provide individuals with the skills and knowledge to offer initial support to someone experiencing a mental health crisis or developing a mental health problem. The key features of the MHFA include the recognition of signs and symptoms of common mental health problems (e.g., depression, anxiety, psychosis, substance abuse, self-harm, suicidal behaviors), strategies to approach people experiencing mental health issues, improve mental health literacy, reducing stigma, and emphasizing the importance of seeking professional help. The standard version of the MHFA initiative addresses mental concerns within the adult demographic, whereas an alternative version is customized for adults encountering young individuals experiencing mental health challenges. MHFA ultimately boosts the mental health understanding of the broader population. Consequently, it sets off the cascade effect, increases self-awareness, and heightened comprehension of one's own and others' emotional welfare, thereby actively reducing stigma (Hadlaczky, Hökby, Mkrtchian, Carli, & Wasserman, 2014).

The literature review focussed not only on the intervention strategies but directly on ABS techniques to enhance the impact of mental health intervention, is brief even when it is not new and the research on general health intervention is broad. Briscoe and Aboud (2012) analyzed 24 interventions intended to foment behaviors that favor child health (i.e., the use of bed nets, hand washing, face washing, and complementary feeding). Their work allowed a new categorization and expansion of the list of behavior change techniques presented by Abraham and Michie (2008), after analyzing techniques of behavior in developing countries to reduce child morbidity and mortality. In this new organization the authors divided the techniques used into six categories: information, performance, problem-solving, social support, materials, and media) and the effect of the use of multiple of them, combined with how involved individuals were on the levels of behavior, social interaction, sensory perception, and cognitive engagement. The new categorization effectively organized the methods frequently utilized in the 24 interventions, each targeting a distinct psychological aspect of learning, including behavioral, social, sensory, and cognitive domains.

Biscoe and Aboud (2012) reported in all 24 interventions information was given to the target audience about the health problem, either on how to display the desired healthy behavior, either orally or written and in some cases a popular spokesperson was used as a social hook. As well, interventions used performance-based techniques (i.e., modeling/demonstrations, rehearsals of the behavior, feedback on performance, rewards, and identification of cues to action) the most used technique was modeling, present in thirteen out of twenty-four, while rehearsal was present in three of them. Feedback was present in combination with other techniques. The review presents problem-solving as the category in which cognitive processes are activated to find effective solutions for challenging or complex

healthy behaviors. Inside this category several techniques are included such as identification of facilitators; identification of internal or external barriers; and recognizing solutions to overcoming the barriers. According to Biscoe and Aboud (2012), problem-solving techniques are less commonly used than other categories and where most likely present in group sessions or when in the presence of a caregiver.

Social support was used in more than half of the intervention, from peer intervention to community assemblies were considered in this group. In most of the cases, this technique was used to recommend and normalize healthy behaviors. The fifth technique identified to encourage healthy behaviors was providing the materials to execute the desired action or set of actions. It was reported as efficient as it reduced the adoption cost and acted as an incentive. Lastly, the use of media was largely used. The authors account for songs, role play, pictures, and flashcards as forms of personal intervention. Small media or decentralized and community-based channels of communication (i.e., local newspapers, community radio stations, online blogs, and social media platforms) were very relevant in the contexts where the interventions were executed and transferred personal or cultural information. In only two interventions mass media, particularly the radio, was used to broadcast information, and the desired behaviors were normalized and established as new norms as radio dramas (Biscoe & Aboud, 2012).

Employing various techniques seemed to cost-effectively influence several psychosocial aspects (or procedures), particularly in the areas of behavioral, social, sensory, and cognitive domains. The benefit emerges from the connection of the message with diverse processes, thereby enhancing the probability of learning, remembering, and maintaining the practice. All twenty-four interventions used at least one technique in addition to information

and about 11 used more than four techniques to target diverse bias or heuristics that hindered the adoption of the desired healthy behavior. According to the report, performance, social support, small media, and materials were the most used techniques. In this context, the most effective approach as an intervention to obtain the behavior seems to involve employing diverse techniques that target different channels to facilitate active learning and lasting recall.

It is relevant to highlight how all the techniques used in the interventions respond to several theories and fields (i.e., communication, pedagogy, marketing, psychology). For instance, the Health Belief Model (Hochbaum, Rosenstock, & Kegels, 1952) intended to understand and predict health-related behaviors. According to this model, an individual's likelihood of taking health-related action is influenced by their perceived susceptibility to a health threat, perceived severity of the threat, perceived benefits of taking a specific action, and perceived barriers to taking that action. Several tactics identified by Briscoe & Aboud (2012), such as the ones present in the information and problem-solving techniques respond to this model. Nonetheless, according to the authors, none of them seemed to be used systematically.

Numerous health behavior models exist, basing their processes on the shared premise that individuals thoughtfully consider the advantages and obstacles to adopting a behavior, concerning their problem and the probable seriousness of negative consequences if they choose not to adopt. In other words, conventional models posit that individuals engage in reflective thinking rather than automatic responses. It is known that even after acknowledging facts and relevant information, actions might not be generated automatically, it is then when applying insights from ABS can enhance health and particularly mental health outcomes. One of the few reports on mental well-being is the one presented by the World Bank (2015).

According to this organization, effective mental health campaigns can leverage on BI, as the decision-making process responds to the general logic. The limitation of attention, automatic responses, the weight of social approval and social norms, and the frames to interpret information affect the impact and adherence of the target audience to the interventions designed to improve mental well-being. Under this train of thought, the following table presents several behavioral tools that modify subtly the choice architecture altering the way people make decisions in the care sector.

Category	Behavioral Tool	Purpose	Source
Social	Use of mass media	Increase informed decision-making regarding care as it increases the knowledge on how to improve their health, where to seek help, or what type of information to look for when making decisions.	World Bank, 2015
Social	Social learning		World Bank, 2015
Information processing	Make the steps needed for preventive care salient	Facilitate the process and increase the possibility of generating the desired care behavior.	World Bank, 2015
Simplicity	Reduce barriers to the desired behavior		World Bank, 2015
Education	Reframe believes	Change behavior by modifying the target audience's beliefs (i.e., perception of social approval, the perception of others' behavior, and the confidence in one's capability to execute the behavior) related to the advantages and disadvantages of a particular health measure.	World Bank, 2015
Education	Reinforcement and feedback	Increase the willingness to engage in healthy behavior.	World Bank, 2015
Memory	Remainders and prompts		World Bank, 2015

		Also useful for healthcare personnel to improve performance.	
Financial incentives	Lowering/zero action cost	Improve adoption of the healthy behavior by making it more affordable or easier to experiment with the adoption of the behavior if the target audience when not certain of the benefit. Zero cost might be intended as the healthy behavior as the social rule.	World Bank, 2015; Kremer & Glennerster, 2011
Financial incentives	Conditional cash transfers	Motivate and help maintain healthy behaviors while the change is occurring.	World Bank, 2015
Information processing	Saliency	Highlighting the benefits of healthy behavior, especially making salient the immediate benefits, simplifies the adherence process.	World Bank, 2015
Memory	Remainders	Increase adherence to medical treatments and medication intake. Also useful for healthcare personnel to adhere to protocols.	World Bank, 2015
Information process	Personalized messages		World Bank, 2015
	Trust-enforcement	The reliance to pursue medical attention, the assurance to adhere to recommended treatments, and the confidence to comprehend guidance on their well-being favor a positive relationship with the healthcare system.	World Bank, 2015; Ashraf, 2013

Table 1. Behavioral tools to modify decision-making and behavior in the healthcare sector.

Regarding the theoretical approach on how to design, evaluate, and test the interventions it has become evident the lack of systematical reviews. Only in 2009 Dr. Laura

Damschroder, Research Investigator with the Veterans Affairs (VA) Ann Arbor Center for Clinical Management Research and Principal Investigator of the Maintaining Implementation through Dynamic Adaptations (MIDAS) QUERI program, realized the urge to assess health implementation outcomes and its effectiveness in context to optimize its benefits and correct the errors to make it sustainable and replicable. For so, the MIDAS team created a comprehensive framework to guide implementation research in healthcare settings. The researchers initially conducted a systematic review of frameworks and theories that were related to health interventions. The next step was to identify common constructs and elements across various models, after this was done, the identified components were integrated into a comprehensive framework. This became the Consolidated Framework for Implementation Research (CFIR), according to the Center of Technology and Behavioral Health.

The CFIR is a framework used in implementation science to understand, comprehensively, factors influencing the successful adoption and implementation of innovations in various settings. By incorporating its main five factors of analysis it becomes a useful and accurate structure for approaching complex, multi-level problems by merging key constructs from published implementation theories (Damschroder, Aron, Keith, et al., 2009). The CFIR is based on a list of constructs that help the development and verification of theories while building the methodology behind them. Then, the constructs, guide the diagnostic assessment of the implementation, taking into consideration the context's needs and demands, help evaluate the intervention, and based on the initial theory building and the context characteristics it allows the evaluation of the intervention aimed at enhancing quality. (Damschroder, et al., 2009).

Three main concepts for the CFIR are fundamental for its understanding, before describing the five domains on which is based. The first one is *implementation*, referring to "the constellation of processes intended to get an intervention into use within an organization; it is the means by which an intervention is assimilated into an organization… by its very nature, is a social process that is intertwined with the context in which it takes place." (Damschroder, et al., 2009, p.3). In other words, it's the collection of procedures designed to intervene within an organizational context. While *context* is "a constellation of active interacting variables and is not just a backdrop for implementation… is the set of circumstances or unique factors that surround a particular implementation effort" (Damschroder, et al., 2009, p.3). The critical element of the context is the comprehension of the interacting factors of the background with the behaviors intended for the specific implementation. Lastly, the *setting* is the group of characteristics of the environment where the constellation of processes occurs.

According to the CFRI, there are five main factors, each with several levels, that influence the implementation of interventions in the mental health sector. The first one corresponds to the characteristics of the intervention, it emphasizes that without modifications, interventions often face challenges as they may not align well with the existing context, leading to resistance from individuals impacted, necessitating an active effort to involve and engage individuals for successful implementation. Some levels for this factor are support based on evidence, comparative superiority, adaptability, testability, complexity, and cost. The second one is the implementation of the outer setting, which regards the economic, political, and social dimensions of the environment. Some of the levels of this domain are the capacity of the organization, the target audience network, the external policies' requests,

and the resources of the target audience. For this last one the Practical, Robust Implementation, and Sustainability (PRISM) model can be used for it, as it engages the patients' choice, their barriers, program elements transition, satisfaction levels, the capacity to network, and external pressure to intervene the problem (Damschroder, et al., 2009).

Thirdly, inner settings refer to the promptness of the organization to generate the change once the implementations are ready to be executed. Some of the levels of this factor concern the structural characteristics, the organizational culture, the organizational climate, resources availability, access to knowledge, and leader quality. The fourth domain is the characteristics of the target audience, counting on the fundamental role of the factors that influence the intervention implementation, this factor emphasizes underscores that individuals actively contribute to the decision-making processes, exercising agency and exerting power and influence, which can lead to both anticipated and unanticipated outcomes for implementation. Moreover, it highlights how a myriad of elements of the target audience, such as the cultural and individual perspectives, norms, interests, and beliefs influence the dynamics of the implementation context. For so, some of the levels of this domain are self-efficacy, willingness to change, knowledge, and general resources, values, and motivations. The fifth and final factor is the process of the implementation - similar to the ones presented in the previous chapter –. Once the need of active change integrating the individual practices, the organizational context, and the setting is acknowledged; the intervention "should" be successful. Hence the levels of this dimension are planning, engaging, executing, reflecting, and evaluating (Damschroder, et al., 2009).

Powell, McMillen, Proctor, Carpenter, Griffey, Bunger, Glass, and York (2012) used the CFRI to guide their research. The authors' first aim was to identify, and test strategies

that intend to propagate and implement evidence-based treatments that try to improve the quality of health and mental health care interventions. To later present a methodical intervention process for embracing and assimilating health innovations grounded in evidence into standard care practices. Within all the factors, Powell et al. (2012) distilled and synthesized the lists of tactics presented by each paper which allowed a final compilation of 68 strategies divided into six categories and developed a taxonomy for the intervention implementation tactics (for the complete categorization and definitions see Powell et al., 2012, pp 136-146). The first 42 strategies belong to the main categories and have been subdivided into 5,4, and 3 levels respectively. Table 2 presents the densest strategies (i.e., plan, educate, and finance); each column is a factor while every row corresponds to a level and its particular techniques. Table 3 presents the remaining factors (i.e., restructuring, quality management, and attending to the policy context), however, Powell et al. (2012) did not present any categorization for the last 26 techniques. The paper advocates for the use of these strategies tailoring them to the features of the innovation, the environment, the local reality and context, and the target behavior change. It is recommended to begin with categories and strategies that raise stakeholders' awareness of the innovation and progress towards those that incorporate and sustain the innovation in routine care.

Plan Strategies	Educate Strategies	Finance Strategies
Gather information ● Evaluate local requirements; ● Examine the preparedness and pinpoint obstacles;	Develop materials ● Create impactful educational content; ● Formulate a glossary.	Modify Incentives ● Modify incentive/ compensation frameworks; ● Employ capitalized payments; ● Impose penalties;

● Visit alternative locations.		● Utilize alternative payment models; ● Adjust patient/consumer fees, either reducing or increasing.
Select strategies ● Create a structured execution plan; ● Customize approaches to overcome obstacles; ● Execute the scaling up of implementations in phases; ● Demonstrate and replicate transformative processes.	Educate ● Hand out educational resources; ● Facilitate educational meetings; ● Carry out continuous training; ● Do dynamic training; ● Undertake educational visits; ● Employ train-the-trainer methodologies; ● Offer continuous consultation.	Facilitate financial support ● Include in fee-for-service rosters/ formularies; ● Finance medical innovation; ● Secure funding; ● Simplify the billing process.
Build Buy-In ● Facilitate discussions for local agreement; ● Engage in executive committees;	Educate through peers ● Leverage on local influencers; ● Establish a collaborative	

● Recognize and equipe advocates; ● Include the target audience, consumers, and family members in the process.	learning environment; ● Observe fellow healthcare practitioners.
Initiate leadership ● Enlist, appoint, and provide training for leadership roles; ● Compel transformation.	Inform and influence stakeholders ● Utilize mass media; ● Foster active engagement from patients; ● Increase requests; ● Collaborate with educational institutions.
Develop relationships ● Form alliances; ● Create agreements to share resources; ● Secure official commitments; ● Foster collaborations with academic institutions.	

Table 2. Technique categorization and subcategorization of strategies to disseminate and implement mental health-care treatment.

Restructure Strategies	Quality Management Strategies	Attend to Policy Context strategies
● Adjust professional responsibilities; ● Establish new clinical teams; ● Modify service locations; ● Alter physical infrastructure and equipment; ● Enable the transmission of clinical data to providers; ● Adjust record systems; ● Initiate a supplier organization.	● Establish and structure quality and monitoring systems; ● Create instruments for monitoring quality; ● Conduct audits and foment feedback; ● Promptly remind clinicians; ● Leverage on advisory boards and workgroups; ● Continuously reassess the implementation; ● Execute periodic small tests of change; ● Apply data warehousing methods; ● Employ an improvement/implementation advisor; ● Utilize data specialists; ● Gather local expertise; ● Coordinate meetings for clinician implementation teams.	● Modify accreditation or membership prerequisites; ● Revise liability statutes; ● Establish or modify credentialing and/or licensure criteria.

Table 3. Technique categorization of strategies to disseminate and implement mental health-care treatment.

Throughout the bibliographical research done for the writing of this thesis, as the searches funnel from general behavioral science techniques to design effective interventions into behavioral science techniques to design effective interventions in the mental health sector the number of papers, and even the quartiles of the papers where published, reduces significantly. Most of the information found regarding behavioral science, intervention, and mental health contend techniques intended for health public policy with little to no reference to mental health. Additionally, it would be key to stress how unless it involves extensive Behavioral Teams (such as BI Team, The World Bank, Ideas42) or private corporations, most of the interventions examined to understand how mental health interventions are being designed, especially in vulnerable contexts, respond to an empirical logic. The lack of scientific evidence affects, in the long term, the sustainability of the intervention and the possibility of diffusing its results and impacting other contexts with similar problems.

In 2007 the National Institute for Health and Care Excellence designed a guideline on how health behavior change interventions can be made part of standard health and social care practice and the revision in 2017 showed no critical necessity to update it. Doesn't this show the effectiveness of ABS in public policy design? If that is the case, why is behavioral science not widely defused for the design of mental health interventions? Kelly and Baker (2016) identified six key errors committed when designing public policy; the analysis was done by evaluating work done in the healthcare sector. However, it is relevant to highlight, once again, that no mention of particular emphasis on mental health was brought up. The author's main thesis supports that when addressing change in health-related behavior nonscientific approaches are generally the ones that are used to solve complex questions. Relying on common sense is in most cases the reason behind the lack of behavioral research. It neglects

the multifaceted nature of human behavior, which as it has been explained in previous chapters, is shaped by a myriad of factors. The complexity of human behavior and decision-making due to its interaction cannot be comprehended under common sense reasoning.

Kelly and Baker (2016) assert that superficial policymaking can be a consequence of considering preventing and promoting healthy behavior merely needs public messages broadcast. Marketing, as a discipline, leverages a range of techniques to shape consumer behavior. Using targeted campaigns, market research, and persuasive messaging. Marketers seek to create awareness, generate interest, and ultimately drive consumer action. The objective is to create a favorable environment for consumers to make purchasing decisions or take specific actions, often employing a mix of advertising, branding, and promotional efforts to achieve these objectives. When applying similar tactics into the public policy realm this process needs to be done considering multilevel strategies, involving highly advanced advertising and promotional strategies, and designing long-term, multimedia campaigns to establish trust among the target audience and build credibility and positive relationships over an extended period. Modifying decision-making and influencing behavior in public policy requires a deeper understanding of the needs, the audience characteristics, the reasons why the unhealthy behavior is being maintained, the context where it emerges, the social surroundings, and the understanding of the automatic thinking decision-making process. Flawed campaigns respond to the extreme simplification of the stimuli-response models and the unevidenced extrapolation of private industry techniques to influence behavior.

Linked to this idea, when broadcasting messages it is also common to assume that showcasing knowledge or expert information on its own is enough to drive behavior. While in traditional medical contexts, the relationship between the patient and the doctor is

generally vertical and the knowledge of the physician is hosted, respected, and prioritized. But research has shown that when addressing chronic illness, when patients have great knowledge of the matter, and when doing prevention this approach is less efficient (see Marteau, Hollands, & Kelly, 2015). The reason for this, according to Kelly and Baker (2016), is that publicizing the desired behavior without considering the context in which the unhealthy behavior arises and the consequences that maintain it minimized the possibility of integrating the desired behavior into the target audience's routine. Furthermore, the effectiveness of the messages presented as "expert-driven information" depends on different elements such as trust in the source, clarity of the message, and relevance to the target audience. If there is a lack of trust or if the information is perceived as biased, imprecise, or insignificant, then the impact on behavior change may be limited.

Also, in the view of Kelly and Baker (2016), common sense does not reach to grasp the -not so- dichotomic consequences of human rationality and irrationality. It has been widely studied the automatic processes in decision-making. One of the principal concepts of the economic utility theory was presented first chapter of this thesis when explaining how the driving force in human behavior might not be the most efficient, healthy, and conscient objective, but in most cases, the most pleasurable, accessible, and with less risk of cost. In other words, human beings can act irrationally if that reduces the cognitive effort. What might be considered as common sense, such as displaying a wide array of healthy behaviors might not be the reality if they are not functional. However, it is false to also assume that every behavior is unthought. ABS plays a fundamental role in understanding the patterns of how the undesired behavior plays a role in the target audience's life. Behavior is immersed in a context with particular characteristics, like a set of needs that arise from the habits of the

target audience and the social environment around them. Hence, displaying a wide array of healthy behaviors might not be the reality if they are not functional, in the context. Common sense, not being so common, cannot cover the complexity of cognitive process, identity building, and context.

It is known, and mentioned at the end of the first chapter that ABS has weaknesses. There is no guarantee of a perfect prediction of human behavior. Especially, when the evaluative phases along the process are not done correctly. Throughout the bibliographical research several guidelines were found but still no standardized criteria and methodology have been created, which makes the ABS process harder and unsupervised. Furthermore, it was common to see assessments of interventions where several techniques were used to change one behavior; the interaction between all of them was the only element considered. To rephrase, the intervention tactics are not operationalized and have no consideration of levels and factors; the experimental designs assumed the whole process as a single independent variable. As a result, this interaction of all of them might hinder the comprehension of individual techniques and their contributions or setbacks.

In conclusion, the predictive causal models used to build behavioral insights are not yet systematized and are not one hundred percent accurate, the cost in terms of the team, the time, and the tools might not facilitate the process. Nonetheless, the interventions that alter choice architecture and conduct a systematic analysis of behavior change techniques, do contribute to a deeper understanding of the mechanisms that support behavior change to enhance public health. So, even considering the expenses of the big brains and deep research, isn't investing in scalable, accurate, beneficial, and anticipatory research cost-effective?

CHAPTER FOUR: THEORETICAL PROPOSAL TO INTERVENE IN THE PERMESSO DI SOGGIORNO APPLICATION PROCESS IN ITALY

Mental health can be influenced by a myriad of elements within the environment. For so, government policies, even when nonrelated to the healthcare system, can significantly influence health. For many decades the World Health Organization (WHO) has presented several proposals for public policies that emphasize the integration of well-being consideration into decision-making in a wide range of sectors and policies, beyond the health-care sector. In 2014, this organization issued a resolution, the Health in All Policies (HiAP). The objective of the HiAP is to address public policy structure and health implications of social determinants to increase the population's well-being in all aspects (World Health Organization, 2014). It recognizes variables such as education, housing, energy, urban planning, transportation, employment, environmental policies, and industry as relevant to impact health. As the governments create conditions for the development of these areas, they are also supporting the overall improvement of well-being.

The HiAP recognizes the complex interconnection of social, cultural, political, economic, and environmental factors and acknowledges that major health challenges, such as noncommunicable diseases, health inequities, climate change, and rising healthcare costs, are intricately interconnected and often share common underlying factors known as social determinants of health. That is why the key principles include government intersectoral collaboration and communication; guarantee of coherent and complementary policies across the different government sectors; inequality reduction in general social and economic factors that directly relate to health inequities; a plurality of perspective consideration by involving

communities, stakeholders, and general population in the policymaking development; and evidence-based decision making. Furthermore, the HiAP scope is to promote healthy communities and, specifically, achieve health equity across different population groups. Health equity involves ensuring that everyone can attain their highest level of health, regardless of factors like socio-economic status, race, gender, or other social determinants. It emphasizes the need for policies that not only treat sickness but also address the social, economic, and environmental factors that contribute to health disparities. By doing so, the WHO expects the governments can create a more inclusive and equitable society where everyone can live a healthy life (World Health Organization, 2014).

The immigrant population, both forced or voluntary, is greatly affected by general policies (e.g., environmental policies, taxation policies, or social security policies) and immigrant-specific policies (e.g., entry policies, resettlement policies, anti-discriminatory policies, or citizenship policies). Juárez, Honkaniemi, Dunlavy, Aldridge, Barreto, Katikireddi, and Rostila (2019) conducted a systematic review by searching PubMed, Embase, and Web of Science databases for quantitative studies between 2000 and 2017. The research objective was to compare the health effects of non-health-targeted public policies on immigrants with a relevant comparison population. The search included articles in English, Swedish, Danish, Norwegian, Finnish, French, Spanish, or Portuguese. Using the HiAP approach the researchers evaluated policy effects by migration stage and by health outcome using narrative synthesis, and random-effects meta-analysis. The analysis concluded restrictive entry policies (e.g., temporary visa status or detention) were associated with poor mental health; for the integration phase, restrictive policies especially those related

to welfare eligibility and documentation requirements, are associated with higher odds of individuals reporting poor self-rated health and mortality.

Alegría, Álvarez, and DiMarzio (2017) studied some patterns between immigrant-specific policies, the contextual factors of relocation, and some of the most common diagnoses within the immigrant population such as depressive disorders, anxiety disorders, substance use disorders, psychotic disorders, and suicidality. Even though resilience is one of the major attributes found by the study within all ethnic groups when in place restrictive policies and regulations, regarding the entry of immigrants and their integration into society, negative health consequences have been identified. These health outcomes could be influenced by factors such as limited access to healthcare, heightened stress due to legal and social challenges, or barriers to assimilating into the host society.

In Italy, between January 2015 and November 2023, 840,950 immigrants and refugees were estimated to enter the country; with a net immigration rate of 3.2 immigrants per 1,000 nationals, according to the statistics presented by the CIA World Factbook. In 2011-2012, the Italian National Institute of Statistics (Istat) and the Italian Health Ministry conducted, for the first time, a statistical survey on the " Cittadini Stranieri: condizioni di salute, fattori di rischio, ricorso alle cure e accessibilità dei servizi sanitari" (Foreign Citizens: health conditions, risk factors, healthcare utilization, and accessibility of health services). Through this survey, information was gathered on various aspects of the life and integration process of foreign citizens in Italy. The research was conducted through direct interviews using the Computer Assisted Personal Interview (CAPI) technique on a national sample of approximately 9,600 households with at least one foreign citizen, residing in 833 Italian municipalities. With a total of nearly 21,000 interviewed resident foreigners. The study

reported immigrants' physical and psychological health score average values of 54.6 and 53.9, respectively. In terms of psychological well-being, higher levels were observed among Indians (55.4), while Tunisians appear more vulnerable (52.5) (Istat, 2014). Even though the research conducted evaluated relevant physical health factors such as most frequent diseases, obesity, smoking habits, and medical consultation frequency; few HiAP variables were reported beyond language limitations when addressing medical staff, and schedule limitations and no psychological variables were described.

To the best of this research knowledge, no article has been yet presented on how to apply the HiAP approach in Italy. Nonetheless, as presented by Costa (2017), after the congress in Rome in 2016 “Epidemiologia della salute della popolazione immigrata in Italia. Evidenze delle indagini multiscopo Istat” (Epidemiology of the health of the immigrant population in Italy: Evidence from the Istat multipurpose surveys) it was evident how in general, the access inequalities are a clear factor that plays as disadvantage of immigrant, due to the is the role of low socioeconomic status. Social disadvantage appears to be a significant determinant of the health and access disadvantage of these groups. This points the solution to some of the main health problems of immigrants in the hands of policies and actions that can counteract social inequalities across the entire population. These policies and actions are often non-health-related and fall under the HiAP approach. The author highlights the principal element to start developing a more sensible system is o to break the single social category of “immigrant” and understand the heterogeneity immigration implies by training the government staff with more cultural competencies (Costa, 2017).

Zooming into the local territory, the ULSS 6 Euganea has presented health reports. The ULSS 6 is an office part of the regional socio-health system aimed at improving the

management of services provided to citizens in five districts of the Veneto region. In 2016 they presented an analysis of the health state of Padua's population. The 160-page report included a five-page analysis of immigrants and a three-page analysis centered on mental health. The study mentions 11,8% of the population in Padua were foreign residents and indicates a 10,000/100,000 ratio of immigrants, by the end of 2015. The remaining pages refer to the ratio of immigrant fugitives reported in the region. Regarding mental health, it is reported that during the year 2014, the Mental Health Departments provided services for an average of 205 users per 10,000 inhabitants. This figure exceeds the regional average for the Veneto region by approximately 25%, which is around 163 users per 10,000 inhabitants. The main pathologies presented in the Mental Health Centers were affective psychoses (28.3%); neurotic and somatoform syndromes (25.8%); schizophrenia (22.1%). No reference to immigrants' health or mental health was made in the report.

Specific to Padua, the municipality reported in 2021 statistics on residents with foreign citizenship. From 2001 to 2011, the number of foreign residents more than tripled, while from 2011 to 2021, despite the continuing upward trend, it increased by only 4.7%. The number of nationalities present in 2021 was 141. Excluding foreign residents from Europe (-1%), slight increases were recorded for those from all other continents in 2021 (Comune di Padova, 2021). Despite the fact a significant amount of the transient population in Padua is a non-resident international student community no particular information on this population could be found. When researching public policy in mental well-being in Italy, Veneto, or Padua, either on related or on nonrelated to the health-care system, most of the outcome is mostly forced immigration related. Such is the case of the references in the

Immigration Studies Center (Cestim), the list of articles proposed all regarding the effects of forced migration on mental health.

As mentioned previously, evidence shows that to impact of mental health is fundamental not only to address the healthcare system but also the complex link of social, cultural, political, economic, and environmental factors. To do so public policy in general should aim to protect the population's well-being. So much so that the WHO proposed the HiAP a decade ago. One of the most meaningful procedures for immigrants once arrive in the new territory, during the integration phase, is the documentation process. Juárez et al. (2019) showed a correlation between restrictive policies in this phase and poor self-rated health.

In Italy, every non-EU resident who desires to stay in the country for more than 90 must require a Permesso di Soggiorno (PdS) issued by the Immigration Office of the local Police Headquarters (Questura). The process must start, at maximum, eight working days after the arrival on Italian territory. According to the state police webpage, the immigrant must request in the Post Office the permit application kit; fill in the application file, and attach relevant documentation required for each permit type, including the tax code which should be requested previously, and a revenue stamp; once the kit is filled an appointment must be made to send it in the Post Office by presenting the kit, the passport, and the payment receipt; the Post office will give the immigrant the Questura appointment-receipt, which works as prove of the legal status and a letter with the date an hour for the first appointment at the Police Headquarters Immigration Office; on the first appointment additional documents must be presented and fingerprints will be taken; once that process is complete, the immigrant will receive a text message with date and time to collect the PdS at the Police Headquarters

Immigration Office. The whole process might take between three to eight months to be concluded and must be renewed annually or biannually depending on the type of PdS.

The PdS allows immigrants and stateless individuals present in the country to stay in Italy, under the conditions and within the limits established by current regulations. This document is essential to access basic services such as opening a bank account, registering with the National Health System, and legally applying for jobs - unless the PdS has been asked due to employment under a contract. Complications in this process can significantly affect the life quality and mental well-being of those for who the PdS is required. Hence, intervening in this process to make it more efficient would impact immigrants' mental health. This chapter, then, proposes a research blueprint, a structured plan or framework for conducting research in this matter in the future. To do so, the assessment of the process mentioned above will be done through a theoretical lens using the integrated model of the ABS presented in Annex 1. The intervention proposal is motivated by Hallsworth's (2023b) words "Not all behaviors need to be changed; instead, in some cases, public policies need to be adapted to existing behaviors and habits". It must be taken into consideration as a research design further deeper research should be conducted on the administrative and legal side of the migration offices, which go beyond the scope of this theoretical proposal. Also, research factors such as timelines, objectives, and resources must be defined as the research process starts taking into consideration the real-life context. It is crucial to highlight that to execute this proposal experimental trials should be carried out to understand the viability of the proposal.

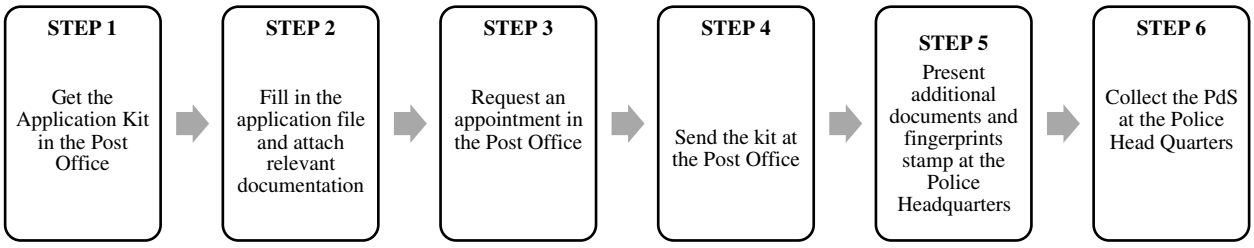
The first step is the team building. First, a leader has to be designated, someone who can understand the complexity of the problem, have managerial skills to coordinate, and is

capable of structuring ABS research. Moreover, the managers need to be in the capacity to find funding and recruit a multidisciplinary team with knowledge and skills in law, international relations, psychology, and management. Then, delineation of the operational process such as the role and the distribution of resources should be established, as well as the procedures to execute and evaluate the process, considering other organizations that are involved and how collaborating with them can impact the efficiency and effectiveness of the PdS process. The viability of the process must be reviewed. To do so, the structure of the executions and evaluation must be assessed considering the adaptability of the ABS proposal in terms of the adaptability, trialability, complexity, and costs. Understanding the outer setting (i.e., external policy requirements, and the target audience resources) and the characteristics of the target audience are tasks that must be done contemplating the governmental setting and the immigrants' settings. Once the structure of the research process has been assessed and adjusted the implementation process can start.

The diagnosis is the third phase. This implies a thick description of the problem, considering the myriad elements that interact with the PdS. The information collected in the later step will determine whether the research process is viable and what must be integrated into this phase. It is recommended to use mixed methods. This guarantees a deep comprehension of the experience of emitting and receiving the PdS while keeping control and accuracy in the variable identification. By doing so the BDT will be able to recognize key touchpoints and the patterns throughout the process that can be modified. This research must guarantee adequate methods to measure attitudes, beliefs, social norms, and legal processes, which require the combination of several research techniques and diverse knowledge to later read, interpret, and understand the data.

Once the context is clear, it is necessary to identify in each of the steps all of the problematic behaviors, considering all the stakeholders' needs, and hierarchize them. This process can be systematized using the Behavioral Reduction Tool, an instrument that integrates functional behavior assessment, differential reinforcement, and response costs. By doing so it reduces and simplifies the operationalization process of the steps in the process that can be improved. Dogfooding is required in this phase as the BDT can understand better the critical points of the Questura and the immigrants. By experiencing the process firsthand, the team gains valuable insights into the process and the performance, identifying issues early on.

Once the observation of the PdS emission process is complete a behavioral mapping should be designed. It allows the identification of psychological, social, legal, and contextual factors that can enhance, affect, or limit the process. Environmental and behavioral analysis is needed to complete the process. The information can be recorded on a map or chart, allowing patterns and trends in behavior to be analyzed and understood.



Graph 3. The process to obtain the Permesso di Soggiorno.

STEP 1 (Government)	STEP 2 (Government)	STEP 3 (Government)	STEP 4 (Government)	STEP 5 (Government)	STEP 6 (Government)
Receive the kits		Update the available dates on the web page	Receive the kit	Organize the immigrants in line	Communicate the time and date of the PdS emission

Place them conveniently		Guarantee the web page is running	Control for the documents and register the receipt	Control and categorize the requests	Organize the immigrants in line
Inform the personnel where and how to hand in the kit			Send the kit	Receive the documents and stamp fingerprints	Control and categorize the requests
Inform the competent authority if the kits are running out			Print the Questura appointment-receipt	Review each case based on the legal guidelines	Hand in the PdS
STEP 1 (Immigrant)	STEP 2 (Immigrant)	STEP 3 (Immigrant)	STEP 4 (Immigrant)	STEP 5 (Immigrant)	STEP 6 (Immigrant)
Get to the Post Office	Fill in the kit	Access the webpage	Get to the Post Office on time	Get to Questura on time	Get to Questura on time
Ask for the kit	(Collect and) Attach all the documents required	Search for the appointment request tab	Hand in the kit correctly filled in and with all the documents required	Do the queue	Present the payment receipt and the passport
	Buy and attach the revenue stamp	Choose a time and date for sending the kit	Present the payment receipt	Follow the instructions	Take the PdS
			Pay for the process	Present the documents and get the fingerprints stamped	

Table 4. Behaviors during the PdS emission process.

Part of the diagnosis phase is defining the objectives. To do so it's important the BDT considers the type of data that will be needed to achieve them, predicts the analysis that will

be done in later phases, and considers the availability of resources, limitations, and ethical factors. Answering the following questions might help the BDT to define the objectives: “What change are we trying to achieve?”; “What is the key metric that would demonstrate success?”, “Can routinely collected data be used?”, “How large an improvement would be needed to justify doing the project in the first place?”, “During what period would be hoped to see the improvement?”. Using the SMART objective’s structure is recommended to facilitate the evaluation of the research process once the intervention is executed and to guarantee the possibility of reaching the key goals. An example of a SMART objective could be to decrease the waiting time for the PdS emission by 10% in 6 months.

The fourth phase is the intervention design. The main question that needs to be addressed in this step is “How to make the PdS process as easy as possible?”. Based on the behavioral mapping the BDT needs to identify the critical pain points and the most efficient touchpoints to increase the efficiency of the PdS emission process. Aware of the fact there might be a significantly greater amount of touch points that emerge after doing a thorough and real-life research process in the previous phases, the following table presents only some key critical issues that can interfere with the process in each step.

STEP 1 (Government)	STEP 2 (Government)	STEP 3 (Government)	STEP 4 (Government)	STEP 5 (Government)	STEP 6 (Government)
Kit availability	Availability of the information that needs to be handed in	Web page access	Personnel availability to send the kit	Dates availability	Date communication
Kit accessibility	Simplicity in the process to get other documents.	Web page navigability	Cost of the process	Communication of the date	Organization of the immigrants in Questura

Personnel availability to hand in the kit		Dates availability	Information on how to fill in the payment receipt	Information of the requirements for presenting the documents	
			Dates availability on the Questura	Organization of the immigrants in Questura	
STEP 1 (Immigrant)	STEP 2 (Immigrant)	STEP 3 (Immigrant)	STEP 4 (Immigrant)	STEP 5 (Immigrant)	STEP 6 (Immigrant)
Get informed on where to go	Get informed on what documents are required	Get informed on how to request the appointment	Reach the Post Office	Reach Questura	Get to Questura on time
Get informed on what to ask for	Collecting all the documents required		Get informed on what documents must be presented to send the kit	Time availability	Present the payment receipt and the passport
Reach the Post Office	Get informed on how to fill in the kit		Get informed on how to fill in the payment receipt	Get informed on what documents must be presented	Take the PdS
			Pay for the process	Present the documents and get the fingerprints stamped	

Table 5. Critical pain points during the PdS emission process.

To search strategies that simplify the process, once the limiting behaviors are identified, a disaggregation of bias and heuristics can be done to later present ABS techniques which will be used to leverage the process. In this manner, when identifying the strategies,

the limitation can be addressed at a deeper level, responding not only to what are the behaviors but also to the mechanism that might maintain them.

STEP 1 (Government)	STEP 2 (Government)	STEP 3 (Government)	STEP 4 (Government)	STEP 5 (Government)	STEP 6 (Government)
-Visceral bias -Other-regarding preference -Intrinsic reciprocity -Identity-based cognition			-Other-regarding preference -Intrinsic reciprocity	-Visceral bias -Other-regarding preference -Intrinsic reciprocity -Tradition -Identity-based cognition -Representita-tiveness -Fundamental attribution error -Premature closure	-Intrinsic reciprocity
STEP 1 (Immigrant)	STEP 2 (Immigrant)	STEP 3 (Immigrant)	STEP 4 (Immigrant)	STEP 5 (Immigrant)	STEP 6 (Immigrant)
-Narrow framing of the problem	-Narrow framing of the problem -Number of options -Option comprehension -Forcing functions -Reputational cascade -Confirmation bias - Bias of underconfidence	-Narrow framing of the problem -Intention-action divide	-Narrow framing of the problem -Reactance	-Narrow framing of the problem -Forcing functions -Rules comprehension -Other-regarding preferences -Instrumental reciprocity -Reactance -Identity-based cognition	

	-Pluralistic ignorance

Table 6. Bias during the PdS emission process.

Structuring the strategies is the third phase. In light of the timeline, the resources, and the potential of scalation delineated in the initial stages of the ASB research the tactics must be identified. The list of BS techniques that can be used to increase efficiency in the intervention is presented below.

Category	Tactic/Technique
Social	Identity priming
Social	Social learning
Social	"Marketing" social norms ● Use of social media ● Use of small media
Social	Public notice
Social	Public evidence of social cooperation
Social	Leverage on network
Info. processing	Accessibility
Info. processing	Salience ● Personalization
Info. processing	Guided search ● Searching by aspects ● Question trees
Memory	Reminders

Memory	Checklists
Consequence reinforcing	Small wins
Education	Performance-based techniques ● Give feedback
Education	Understand the decision context ● Dogfooding
Education	Understand the decision context ● Assess effectivity
Simplicity	Prefilled-in formats
Simplicity	Reduce barriers
Simplicity	Provide plans
Simplicity	Anticipate the responses ● Deconstruct complex actions into simpler ones
Simplicity	Anticipate the responses ● Write an action plan
Simplicity	Anticipate to responses ● Structure “default” action plans
Simplicity	Simple and adequate language
Simplicity	Cleare reference points to reach out
Problem-solving	Identification of facilitators
Problem-solving	Identification of barriers
Problem-solving	Recognizing solutions to overcoming the barriers

Health	Bias education
Health	Trust-enforcement

Table 7. ABS techniques that can facilitate the PdS emission process.

The strategy design goes beyond listing actions that need to be displayed but is the construction of complex interaction of the diverse actionable steps. It is important to take into consideration the steps necessary for the PdS emission, the pain points, and the bias. Only once that is done the techniques can be transformed into actionable steps or behaviors. This way it is more likely to address all factors and improve the effectiveness of the overall PdS process. The following pages will present several strategies that combine social, information processing, memory, emotionality, consequence reinforcing, education, simplicity, problem-solving, and timing techniques.

In the first place, the origin identity can become a salient category during the migration experience. Literature has shown how the process of relocation generates an amplified awareness of the origin identity as immigrants navigate unfamiliar cultural landscapes and interact with diverse communities (Verkuyten, Wiley, Deaux, & Fleischmann, 2019; Breton, 2015; Schwartz, Vignoles, Brown, & Zagefka, 2014). Likewise, social perspectives and experiences of discrimination based on origin can increase the affiliation of origin identity, leading immigrants to assert their cultural heritage as a means of resilience and empowerment (Breznau & Danielson, 2014). Hence, leveraging the social dimension can help influence well-being profiting on immigrants' shared identities (i.e., Latino, Arab, Indian) to face the Italian PdS emission process more assertively.

The figure of a Community Guide can be implemented as a reference point to facilitate the learning process and to model behavior. This figure can be a person or group of

people who have been trained in the PdS process and work in alliance with the Questura to solve doubts such as where to pick up the kits, how to schedule the appointment in the Post Office or the Questura, how to fill in the kit for the different PdS types, or where to search for the requirements. Across Italy social media is used to connect immigrant groups, the members post comments or questions to help or be helped by others. The Community Guide can actively participate in the Facebook, WhatsApp, and Telegram groups to advise and guide the PdS process. They can also oversee informing new regulations that may arise and the public notices the government might state. If possible, they can be broadcast using small media for the communities that have particular radio or TV channels in Italian broadcasting station companies. Additionally, the Community Guider can also become a reference on what to expect and how to behave throughout the six molding positive behaviors. It would be even more desirable if this figure could be present in Questura to help address the doubts, needs, and undesired behaviors that can occur during long waiting periods. If cooperation between immigrants and the staff then both side's willingness to listen and resolve together, in contexts where interaction is needed, will increase.

Secondly, information needs to be available and clear for all the stakeholders of this process. Accessibility is one of the biggest flaws throughout the steps as the information required by the immigrants is hard to find. On occasion, it is necessary to search into several pages and search through different pads to obtain information, making the effort to goal harder and increasing the mental taxation. In some other cases, information might not be published on official pages but on private pages with no dating reference. When on official pages the language is a clear barrier. When the information is fully presented in Italian, other-language speakers might have significant difficulties accessing the information and in certain

cases, even when there is the possibility of translation, the technicality of the language is highly complex. On the staff side, not in a few cases, the information or updates have not been given or the resources (i.e., kits or dates) might be no longer available. Creating clear, simple, multilanguage resources is fundamental to making this process more effective. The easier it is for the immigrants to obtain the information the less possibility of errors and reprocessing in each step, which reduces the time for the staff to send the documents, evaluate the case, and emit the PdS.

Consigning all the documents in one single page can facilitate the process of searching the information, as well as where to post public notices. The page should also contain a general plan outline with a description of the steps required for each type of PdS, making sure the explanation must be done using simple language. It should also present a list of the documents required with the downloadable formats of the documents required, when possible, or clear guidelines on where to find them and even contact information of the place to find them. For the documents that need to be filled in by the immigrant, such as the kit format and the payment receipt it is recommended to have prefilled-in formats. By doing so the time and effort to complete them should be significantly reduced, as well as the error possibility. To facilitate problem-solving, filters can be integrated into the webpage to search by aspects, question trees to facilitate the search, and a FAQ section. It could even contain a chatbot that allows questions that might arise in the process. Simplifying the search process and increasing reference points declutters the offices as fewer immigrants must have face-to-face meetings, sometimes unscheduled, with the staff. Moreover, newsletters can be used to keep the immigrants updated on critical information and personalized information can be inserted depending on the migrant profile. For usability purposes, there are two main

elements to take into consideration. First, it is critical to guarantee both the page and the newsletter are completely translated. This implies the information regarding the PdS along with the webpage structure such as tabs and menus. Second, the webpage must be designed to follow the heuristics for user interface design to guarantee navigability efficiency.

Ideally, this webpage could also support the PdS application process. In other countries, in and out of the region, most of the process is done online (i.e., Germany, Denmark, UK, Canada, New Zealand). This online platform with document uploading functionality could allow immigrants to create an account, log in securely, and upload documents electronically. It typically involves a combination of front-end web development for the user interface and back-end development to handle user authentication, file storage, and data processing. After logging in and registering a personalized action plan can be automatically presented to the immigrant which guides them through the PdS emission process. This personalization includes a deconstruction of all the actions required to complete the application into actionable and simple tasks necessary for the PdS type. Automatically, a checklist of each step must appear and as the documents are being uploaded the tasks get marked as completed. The platform could also generate reminders when deadlines are about to expire or when dates have been set for necessary in-person appointments. As the evaluation could be done online, feedback on the quality or accuracy of the documents could be generated allowing the immigrant to correct errors almost immediately without having to reschedule appointments and spend hours in the offices.

Finding, filling, and sending all documents online facilitates the process and reduces barriers for immigrants such as time and cost of displacing to the offices, and for the staff, it reduces the resources in terms of money, time, and bureaucratic effort necessary to assist and

answer questions and to print and organize the documents. It also eliminates the possibility of immigrants going to the offices without all the documents and being asked to present themselves again once all the requirements are fulfilled. This implies saving time, not restarting the process, and desaturating the system. Additionally, the checklist and the feedback create small wins and mitigate mental taxation and narrow framing of the problem. The fingerprints and the signature once receiving the PdS could be done in the Questura but it significantly lowers the work done in the office, making the process faster and more efficient for both the immigrants and the staff.

Thirdly, negative beliefs toward immigrants in Italy are unfortunately prevalent. According to the latest available data from the European Social Survey (ESS ERIC, 2023) a significant portion of Italians hold negative attitudes towards immigrants. The ESS is a large-scale survey conducted across 40 countries. Its main goals are to monitor and understand changes in public attitudes and values across Europe, advance survey measurement methods, and develop social indicators. ESS surveys ensure reliability through strict random sampling, high response rates, and careful translation protocols. The last data set presentation (Round 10) in 2020 showed that approximately 43% of Italians expressed negative sentiments towards immigrants, including perceptions of cultural threats and concerns about job competition. During 2023 a new data collection occurred (Round 11), however, results have not yet been published. Even though there is the possibility of response variation on the new set, Round 10 statistics highlight an urgent need to combat negative beliefs in Italy towards immigrants. Having this in mind, it would be necessary to educate the staff to create awareness and recognize when negative beliefs arise. The staff needs to understand and mitigate biases that may influence immigrant treatment and decision-making during the

evaluation process. This helps to promote fairness, consistency, and equity in the PdS evaluation process, ultimately enhancing trust in the system and reducing the risk of discrimination or unfair treatment towards applicants. One of the most transforming factors in the PdS process, in terms of the relation, would be to foster and maintain trust between the public policymakers, the staff, and the immigrants through transparent communication, empathetic care, and consistent delivery of evidence-based practices to increase cooperation, reciprocity, and reduce visceral bias, identity-based cognition, and fundamental attribution error.

The last strategy would be to maintain a systematic assessment of the effectiveness of the PdS process and all of the previous strategies once implemented. This will allow the BDT to update the process according to the requirements. Dogfooding could be one of the best techniques to reach this objective. As researchers directly engage with and experience the process themselves, insights into the facilitators and barriers within the system can be rapidly identified. Allowing a quick solution identification. The BDT and the Offices' staff can gain a more accurate understanding of the challenges and successes encountered by immigrants, allowing for more informed decision-making in updating and refining the PdS process to better meet the needs and requirements of all stakeholders involved.

Being a research blueprint, the following two steps for this proposal are strictly theoretical as the evaluation, the monitoring, and the upscaling of the intervention need to be executed first. The sixth phase is the evaluation of the intervention. Based on the objectives, previously defined, it is necessary to evaluate what is considered as a successful intervention. If the strategies put into action were able to reduce the overall time procedure by at least 10% in 6 months, then it could be considered effective, but what if it was the 8%? What if the time

was reduced but the process application process became more complicated? What if less PdS are being emitted? All the possible scenarios for the outcomes might be taken into consideration and a 360-evaluation must be done while defining "successful", as the intervention has a real well-being outcome.

Once the criteria have been defined, a scientific evaluation must be done. Depending on factors defined in the initial stages of the research (i.e., time, resources, team abilities) and technical information (i.e., data type, sample power) a type of impact evaluation must be chosen. The literature review strongly recommends RCT as it provides a high level of internal validity, minimizes bias, allows for precise control over variables, and ensures that any observed effects can be attributed to the intervention being studied. RCTs are considered the gold standard for assessing the efficacy and effectiveness of ABS interventions due to their rigorous design and ability to produce reliable results. Nonetheless, in some cases, it might not be suitable to conduct an RCT. When resource constraints, logistical difficulties, high variability in response, cultural differences, or when in need of immediate action, alternative approaches are required. As presented in Chapter 2, there might be other types of study designs that aim to evaluate the effectiveness of the intervention such as regression discontinuity (RD), propensity score matching (PSM), or difference in differences (DiD). When evaluating, it is highly recommended to assess the strategies independently to understand the relation between all of them and the effectiveness of the intervention, it would be preferable if each technique could be assessed on its own. Additionally, the BTD is encouraged in any scenario, to do user tests and dogfooding when performing the evaluation.

This phase does not only comprise the assessment of the effectiveness of the intervention, contrasted with the objectives but also must contain a practical and ethical

evaluation. The BDT must evaluate the risks this intervention can pose for all the stakeholders (i.e., security-wise, privacy-wise, legal-wise). This permits the identification of potential negative impacts or unintended consequences so strategies can be developed to mitigate them, minimize harm, and ensure the intervention's effectiveness and sustainability. Another factor to consider is the budget and timeline assessment. It guarantees the project remains financially viable and progresses within the preestablished time frame. By doing so, the BTD can anticipate potential constraints, allocate resources effectively, and make informed decisions to achieve project objectives cost-effectively. Finally, the evaluation must include an ethical analysis. This is necessary to ensure that the intervention respects the rights, autonomy, and well-being of all the parties involved, both from the government side and from the immigrants' perspective.

The seventh phase is the monitoring and scaling of the intervention. It is essential to ensure the effectiveness and adaptability of the strategies over time. Monitoring allows for real-time assessment of progress and identification of any issues or challenges, while scaling enables the intervention to reach a larger population or be implemented in different contexts, maximizing its impact. This stage requires the co-evaluation of the overall intervention as the input of all the stakeholders can provide valuable insights and ensure the intervention meets the needs of both the government and the immigrants. For the monitoring process, it is key to establish an ongoing assessment of the intervention's effectiveness and identify areas for improvement. As mentioned in Chapter 2, "Is there a better way to execute this intervention?", "Is there a cheaper way to execute this intervention?", "How can the intervention be improved?", "What is the action plan to monitor the effects of the

intervention?", and "How can the policy remain active?" are key questions that can guide the monitoring process.

After this is done, the BDT can make informed decision-making for the scaling efforts. For so, there needs to be an understanding of the target population, the cultural dimensions, and the local context to guarantee that the intervention is suitable and relevant. For the nature of this research, it would be important to assess, for example, if the intervention was more effective in a particular national identity (i.e., Latino, Arab, Indian) or a particular demographic segment (i.e., students, working force, elderly). As ABS stands by the scientific model, communicating the results is a key step to help disseminate the information and allow replicability. For the scaling step, understanding the effects on the context and the population to evaluate other scenarios where the insights, emerged from this research, can be useful. As mentioned in Chapter 2 "Is the intervention aligned with the context?", "Are there positive findings in a particular demographic?", "Are there subgroups for whom the intervention worked better?", "Are there subgroups for whom the intervention didn't work as well?", "What is the action plan to scale the intervention?", and "How can the information be disseminated?" are key questions that can guide the scaling process.

To conclude, this thesis has plunged into the intricate world of Applied Behavioral Science (ABS). Initially, elaborating on foundational concepts of ABS such as automatic thinking, social thinking, mental models, and nudging. Manifesting the ABS limitations. It was considered critical to acknowledge its limitations as it allowed to be vigilant when doing the literature review and the intervention blueprint. Afterwards, examining frameworks, toolkits and methodologies used by leading ABS teams (BI Team, OECD, World Bank, and Ideas42), groundwork has been laid for designing effective intervention projects, particularly

within the mental health sector. An insight from the exploratory research was the absence of a systematic framework for ABS studies. Consequently, this thesis endeavored to address this gap by developing a tailored toolkit that integrated existing knowledge gathered throughout the research process. Finally, addressing, through the lens of ABS, the complex interplay of social, cultural, and economic factors affecting well-being. Concluding in a comprehensive intervention proposal aimed at addressing the mental health challenges faced by immigrants in Italy when applying for the Permesso di Soggiorno (PdS). Responding in a cost-effective manner to the HiAP demands (WHO, 2014). Following the Build the team > Evaluate viability > Diagnose > Design the intervention > Structure the strategies > Evaluate > Monitor and Scale structure the intervention proposal was presented in the hopes of shedding light on a real problem, enhance the lives of thousands of individuals, and underscore the transformative potential of ABS in promoting holistic well-being.

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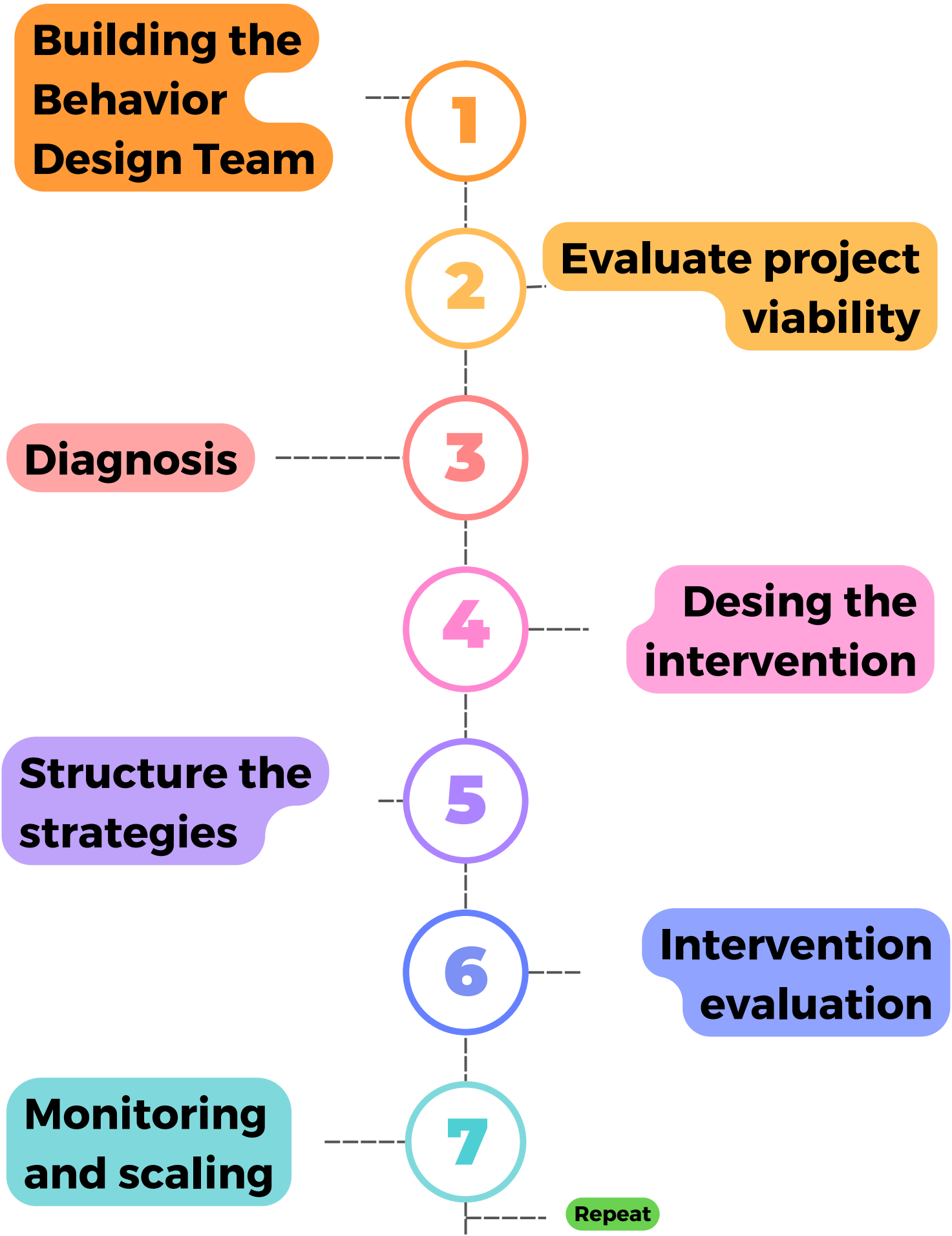
ANNEX 1: INTEGRATIVE TOOLKIT

After the theoretical review, it is possible to identify numerous similarities between the different methodologies, tools, and frameworks used by different researchers a BDT to define the ABS research process. Nonetheless, it was also clear that an integration of those proposal can present an enhancement to the way the process is approached and executed. Therefore, six tool kits were analyzed (Hansen, 2019; Barrows et al., 2018; Internal Revenue Service, 2017; World Bank, 2015; BI Team, 2014; BI Team, 2010), four methodological frameworks (Hadlaczky et al., 2014; Powell et al., 2012; Briscoe & Aboud, 2012). Damschroder, et al., 2009), and two theoretical books (Thaler & Sunstein, 2021; Kahneman, 2011). The analysis consisted of the categorization of information in 6 sets (ABS principles, ABS research steps, ABS techniques, ABS techniques particular to the mental health sector, Bias, and Bias particular to the mental health sector).

For the research process, all the steps were contrasted to identify the main phases. Once all the phases were identified the original stages were reassigned to fit the emergent phases in a manner that facilitated the complementation of information. For phases four and five it was necessary to create a categorization of the techniques and biases found in the literature review. The initial categorization followed the structure presented by the OECD (Hansen, 2019); however, it became evident new categories needed to be added. The categorization was done based on the theoretical background withing the technique was presented by the author or by the affiliation with others already identified. The bias categorization, responded to the order defined for the techniques. The research scope did not pretend to categorize all the possible bias but to identify the ones that appeared to be directly

related to the techniques and predominant in the well-being context. For a wide range of bias, it is suggested to visit The Decision Lab webpage where it is possible to access the complete list available in literature. A glossary was created with the techniques and the biases identified; it is presented as Annex 2.

INTEGRATION OF THE ABS INTERVENTION PROCESS



INTEGRATION OF THE ABS INTERVENTION PROCESS

GUIDING QUESTIONS

1. Does the team have all the knowledge and skills necesary?
2. Can the organization meet the needs of the proyect?
3. What is it going to be faced?
4. What is the context, the behaviors, and the decisions present in the problem?
5. How could the actions be as easy as possible?
6. Is the intervention successful?
7. What can be learned and improved from this intervention?

Repeat!

Building the Behavior Design Team

ideas 42 Building a new BDT

1. Define the **capacity range** of the BDT
   a. Number of projects that can held simultaneously
   b. The type of projects to invest upon
   c. Structure to sequence the tasks to obtain the project objectives
2. Prioritize **network building**
   a. Delineate operational processes
      i. Deciding the composition of the team
         1. Roles
         2. Skills
         3. Distribution of resources per member
3. Establish a **hierarchy of priorities**
4. Design **procedures to evaluate** the execution and results of the ABS process
5. Structure a **valuational method** to choose and prioritize projects
   a. Prioritize local impact
   b. Collaborate with organizations that possess both the capacity and willingness to oversee projects
   c. Have clear touchpoints with the community involved with the ABS process
   d. Ensure data access
   e. Guarantee large samples and RCTs

ideas 42 Improving a BDT

1. **Generate Buy-in**: Secure endorsement and foster commitment with a high-level management leader(s)
2. Find **funding** and stakeholders
3. .Choose strategically the head office to increase **access**, **authority**, and **agility**
4. Guarantee a **multidisciplinary team**

Evaluate project viability

Damschroder CFRI

Assess for

1. **Intervention**
   a. Perception of the intervention
   b. Evidence
   c. Advantages
   d. Adaptability
   e. Trialability
   f. Complexity
   g. Proposal designs for intervention
   h. Costs

2. **Outer Setting**
   a. External pressure
   b. External policies' requirements
   c. Target audience network
   d. Target audience resources

3. **Inner Settings**
   a. Structural characteristics of the organization
   b. Organizational network
   c. Organizational culture
   d. Organizational climate
   e. Resources availability, access to knowledge, and leader quality

4. **Target audience**
   a. Knowledge, values, motivations, and beliefs of the interventions
   b. Self-efficacy
   c. Willingness to change
   d. Trust in the organization

Diagnosis

Diagnosis

1. Create a **thick description** of the situation, using deep techniques
2. Measure **behaviors**, **beliefs**, and **psychological patterns**
   a. Be aware of unconscious patterns
3. If needed adequately use techniques for eliciting **sensitive information**
   a. Introduce personal distance
   b. Use hypothetical cases
   c. Use of vignettes
4. Measure **attitudes** and **social norms**
   a. Implicit association tests
   b. Identifying social norms
5. Apply the dogfooding technique

Behavior

1. Identify all the **unwanted behaviors**
2. Use the **Behavioural Reduction Tool**
   a. Define the policy area
   b. Draw relevant strategic domains
   c. List as many concrete decisions, behaviors, and procedures for each strategic domain as possible
3. **Hierarchize** behaviors
   a. Use assessment questionnaires available
4. Define **objectives**
   a. Formulate SMART objectives
   b. Identify the type of data that is required, possible analysis, and resource availability
5. Define the **context shaping** target behaviors
   a. Use a Process Map

Outcome definition

Answer the following questions:

- What change wants to be achieved?
- What is the key metric that would demonstrate success?
- Can routinely collected data be used?
- How large an improvement would be needed to justify doing the project?
- How long can it take before improvement starts occurring?

Understand context

1. Comprehend contextual **limitations** and **possibilities**.
2. **Collaborate** with organizations possessing extensive expertise in the context.

Diagnosis

ideas 42 Define

1. State the **problem**
2. Eliminate **priors** and **preconceptions**
3. Determine **capacity** and scalability
4. Define the **research problem**

ideas 42 Diagnose

1. Use the **Behavioral Mapping** tool
   a. Identify psychological and context factors
   b. Identify components for decision-making and actions within a process
2. Formulate **hypotheses** regarding the behavioral factors that hinder the manifestation of the desired behavior.
3. Guarantee the **hypotheses are accurate** in the context

Desing the intervention

Design

Answer the following questions based on the previous steps

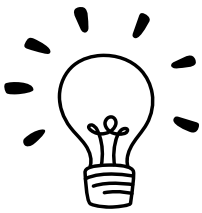
- How is the problem going to be addressed?
- What is the timeline?
- What are the resources?
- How to create the potential for intervention scaling?
- What actions are going to be taken to modify the undesired actions?

Analyze

Organize the Behavioral Mapping actions into the ABCD categories to understand the mechanism of the problem

- **A**ttention
- **B**elieve formation
- **C**hoice
- **D**etermination

SEARCH FOR THE GLOSARY



A glossary was created with relevant biases identified throughout the literature review. It is presented as Annex 2.

Structure the strategies

Build the strategies

Adress the undesired behaviors with the techiques proposed for each category

1. **Target attention**
   a. Make it relevant
      i. Promote a state of mind that is less likely to make mistakes
      ii. Time and place the intervention that increases the likelihood of displaying the behavior
   b. Seize attention
      i. Make it salient
      ii. Use reminders
      iii. Use prompts
   c. Plan for inattention
   d. Use defaults

2. **Target believes information**
   a. Use a guided search
      i. Allow searching by aspects
      ii. Use question trees
   b. Make it intuitive
   c. Support judgement, set the intervention to match intuition
      i. Adapt to heuristics
      ii. Leverage social proof

3. **Target choice**
   a. Make it attractive
      i. Consider motives
      ii. Create perspective
      iii. Trigger emotions
   b. Frame prospects
   c. Make it social
      i. Connect with social identities and consider peer comparison
      ii. Create a sense of community

4. **Target determination**
   a. Reduce friction
   b. Provide plans
   c. Provide feedback
   d. Use commitment devices

Structure the strategies

Build the intervention

This stage can make use of both EAST and MINDSPACE framework

.

1. **Make it Easy**
   a. Profit on default options
   b. Reduce the hassle factor
   c. Simplify the message
      i. Introduce the takeaway message early on
      ii. Use simple and adequate language
      iii. Be precise when presenting an action plan
      iv. Give one reference point to reach out to for responses
      v. Maintain only relevant information

2. **Make it Attractive**
   a. Leverage on saliency
      i. Use sensorial elements
      ii. Novel and simple stimuli
      iii. Personalization
   b. Craft incentives and penalties
      i. Financial incentives
      ii. .Lotteries
      iii. Accentuate the shortage or scarcity of the consequence of the conduct
      iv. Relate the behavior to self-images
      v. Gamify activities

3. **Make it Social**
   a. Use descriptive social norms
   b. Leverage on networks
   c. Encourage public commitments

4. **Make it Timely**
   a. Prompt people during major life events
   b. Contemplate immediate costs and benefits
      i. Draw attention to immediate benefits
      ii. Avoid immediate costs
   c. Anticipate their reaction to events
      i. Deconstruct complex actions into simpler ones
      ii. Write an action plan
      iii. Search for barriers and opportunities during the execution
      iv. Structure default action plans

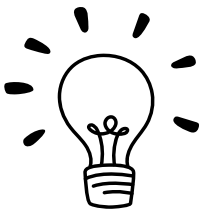
Structure the strategies

Design the intervention

Use heuristics to incentivize the desired behavior

- Feedback
- Channel and hassle factors
- Micro-incentives;
- Identity cues and identity priming
- Social proof
- Physical environment cues
- Anchoring
- Default rules and automatization
- Loss aversion
- Public/private commitments

SEARCH FOR THE GLOSARY



A glossary was created with all ABS tactics and techniques identified throughout the literature review. It is presented as Annex 2.

Intervention evaluation

Evaluate the intervention

1. Define success
2. Involve user-tests early when piloting strategies
3. Explore research designs
    a. Randomized controlled trials (RCTs)
    b. Regression discontinuity (RD)
    c. Propensity score matching (PSM)
    d. Difference in differences (DiD)
4. Know your sample size
5. Assess the risk of the intervention
6. Assess realistically the timeline and budget
7. Assess secure legal, ethical, and other approvals
8. Be transparent about data sharing and publications
9. Consider options for communicating results, long-term monitoring, and scaling

Experimening

- Experiment with different modes of implementation
- Apply the dogfooding technique

Test

Answer the following questions based on the previous steps

- Conduct RTC experiments to evaluate the effectiveness of the evaluation
- If RCT is not possible quasi-experimental evaluation designs should be held (i.e., a difference-in-differences model)

Monitoring and scaling

Change

1. Revise if the project and the intervention are **aligned** with the context.
2. Assess how can the intervention be **best implemented** and **scaled up**.
3. Monitor the long-term and potential **side effects**.
4. Maintain the policy **initiative**.
5. **Disseminate knowledge** widely.

Test, learn, and adapt

1. Conduct **RCT** experimental validation
2. Use methods that involve field **observation** and **co-evaluations** with the target audience
3. **Replicate** to guarantee the initial results continue to hold true in the future
4. **Segment** to understand how different samples react to the intervention and try to adjust the intervention performance if needed
5. Adress more **complex behaviors**

Learning and adapting

1. Ensure that **BDT** consider their **automatic thought processes**, **mental frameworks**, and the **societal influences** affecting their decisions.
   a. R&D is **not** meant to generate **immediate** profits or immediate improvements.
   b. R&D **entails failure**

It is through the process of **experimenting**, **failing**, and **learning** from those failures that **effective, evidence-based** diagnoses and intervention strategies emerge.

Understand context

Answer the following questions

- Are there subgroups for whom the intervention didn't work as well?
- Are the positive findings grouped in one neighborhood or demographic?
- Is there a more cost-effective way to execute your design?

ANNEX 2: GLOSSARY

Bias:

- Social
    - Other-regarding preferences: inclination to cooperate if other do so (World Bank, 2015)
    - Instrumental reciprocity: acting in answer in the same way the first action (World Bank, 2015)
    - Intrinsic reciprocity: desire to punish or reward other's behavior (World Bank, 2015)
    - Status quo bias: Tendency to adhere to the social/default choice (Thaler & Sunstein, 2021)
    - Reactance: Opposite reaction to the behavior suggested or ordered (Thaler & Sunstein, 2021)
    - Tradition: Inclination to favor established customs, practices, or beliefs, without a critical examination (Thaler & Sunstein, 2021)
    - Reputational cascade: Decision-making based on the perceived reputation (Thaler & Sunstein, 2021)

      Identity-based cognition: Aligned believes with the social identity or group affiliation (Thaler & Sunstein, 2021)
    - Pluralistic ignorance: Rejection of a norm or belief assuming incorrectly that most others accept it (Thaler & Sunstein, 2021)

- Information processing
    - Confirmation bias: Selective gathering and automatic interpretation of information based on prior beliefs and disregard of information that contradict those beliefs (World Bank, 2015)
    - Motivated reasoning: Generating conclusions that are aligned to believes. (World Bank, 2015)
    - Overconfidence/Underconfidence bias: Miscalculation of the abilities in comparison to the real ones (Johnson & Fowler, 2011)
    - Availability heuristics: Assessment of a decision based on the information accessible (Thaler & Sunstein, 2021)
    - Representitativeness: Assessment the likelihood of an event based on how similar it appears to a prototype or element that is being compared to (Thaler & Sunstein, 2021)
    - Unrealistic optimism: Believe that the decision-maker is less likely to experience negative events and more likely to experience positive ones. (Thaler & Sunstein, 2021)
    - Hot-cold empathy gap: Underestimation of the impact of visceral states on their decision-making when they are in a different emotional or physiological state (Thaler & Sunstein, 2021)

- Consequence neglect

    - Intention-action divide: Failure of making decisions that have positive consequences in the future as it demands energy in the present (World Bank, 2015)
    - Narrow framing of the problem: Obstacles in the actioning stops its execution even when consequences can be severely negative (World Bank, 2015)
    - Sunk cost bias: Difficulty to halt a plan once resources have been invested (World Bank, 2015; Arkes & Blumer, 1985)
    - Present bias: Prioritize immediate rewards over larger, delayed ones (Thaler & Sunstein, 2021)
    - Elimination by aspects: Rejection or disregard of options based on particular criteria (Thaler & Sunstein, 2021)
    - Extremeness aversion: Tendency to prefer options that are in the middle of a range, avoiding extreme choices, even when they might be better (Thaler & Sunstein, 2021)

- Loss-aversion: The loss feeling generates a stronger response compared to the gain (World Bank, 2015)
    - Endowment effect: people are more triggered by the prospect of loss than by the prospect of gain (Hansen, 2019; Kahneman et al., 1990)

- Financial
    - Mental accounting: Categorization and treatment of assets, generally money, based on its source, purpose, or intended use (Thaler & Sunstein, 2021)

- Complexity
    - Number of options: The higher the number of options the harder it is to decide (World Bank, 2015)
    - Option comprehension: Unclear alternatives affects and slow-down the decision-making process (World Bank, 2015)
    - Forcing function: The need to do one or several tasks first before being able to achieve the desired consequence (Thaler & Sunstein, 2021)

- Health bias
    - Diagnosis momentum: Difficulty in modifying the diagnosis even with new evidence (World Bank, 2015)
    - Fundamental attribution error: Assigning responsibility for the symptoms to the patient instead of investigating possible causes of the symptomatology (World Bank, 2015)
    - Gender bias: Attributing the gender as the cause of the symptoms (World Bank, 2015)
    - Outcome bias: Giving the patients the most positive diagnosis (World Bank, 2015)
    - Premature closure: Speedy diagnosis before enough evidence is gathered (World Bank, 2015)
    - Visceral bias: Diagnosis being affected by the level of like or dislike of the patient (World Bank, 2015)

- Authority bias: Place undue trust in perceived authorities which leads to follow their directives without critically evaluating them (World Bank, 2015)

Nudges and Behavioral Tools:

- Social
  - Invoke positive identities: Encouraging individuals to adopt their favorable group affiliations to influence their attitudes and behaviors positively (World Bank, 2015)
  - Identity cues/ identity priming: Activating aspects of an individual's self-concept or group identity to influence their thoughts, feelings, and behaviors (World Bank, 2015)
  - Social learning: Molding behavior, especially by others who are similar or a reference point (World Bank, 2015)
  - "Marketing" social norms: Leveraging persuasive messaging and techniques to promote behaviors aligned with social influence (World Bank, 2015)
    - Use of social media (World Bank, 2015)
    - Use of small media (Biscoe & Aboud, 2012)
    - Use of mass media (World Bank, 2015)
  - Inspirational messages: Evoking positive emotions, motivation, and aspirations in individuals, leading to increased behavior change (World Bank, 2015)

- Public notices: Formal announcements or communications made by authorities or organizations to inform the target audience about specific information or regulations (World Bank, 2015)
- Public evidence of social cooperation: Displaying of individuals or groups engaging in cooperative behaviors, which serve to reinforce social norms (World Bank, 2015)
- Social rewards: Incentives individuals receive from social interactions, such as approval, recognition, or acceptance (World Bank, 2015)
    - Social status (World Bank, 2015)
    - Social recognition (World Bank, 2015)
    - Social Ranking schemes (World Bank, 2015)
- Norms that generate action: Standards that both dictate the appropriate behavior and actively motivate individuals to engage in specific actions (World Bank, 2015)
- Change the social meaning of actions: Altering the perceived interpretation of behaviors within a social context, through messaging, framing, or contextual cues (World Bank, 2015)
- Social settings that generate argumentative and deliberative environment: Active discussion, debate, and thoughtful consideration of different perspectives (World Bank, 2015)
    - Red teaming or Rival group identifying weaknesses (World Bank, 2015)
- Social proof: Using actions and behaviors of others as a guide for their own behavior (Hansen, 2019)

- Social norms: Showing that most people perform the desired behavior (p.28) (Hansen, 2019, p.33; BI Team, 2014)
- Create social support and reinforcement: Stablishing networks, relationships, or structures within a community that provide encouragement, validation, and assistance (World Bank, 2015)
- Leverage on networks: Using existing social connections, relationships, or networks to influence behavior, disseminate information, or facilitate communication and collaboration (BI Team, 2014)
- Identify a specific villain: Attributing responsibility for a to a particular individual, group, or entity, serving to mobilize collective action (Thaler & Sunstein, 2021)

- Information processing
  - Accessibility: Sequencing information so the content can be registered easily and weighted properly (World Bank, 2015; Kahneman, 2003)
  - Anchoring: Noticeable comparison created by the context that bias the decision (World Bank, 2015, p,195)
    - Reference point: benchmarks (World Bank, 2015)
    - Labels on options (World Bank, 201)
    - Number of options (World Bank, 2015)
    - Presenting connections, if any, between the options (World Bank, 2015)
  - Framing: Strategic presentation or framing of information, issues, or choices (World Bank, 2015)

    - Salience: Emphasis on prominent information over the set of general information which is used to lead decision-making (Hansen, 2019; World Bank, 2015; BI Team, 2014)
        - Sensorial elements (i.e., images, colors, particular sounds) BI Team, 2014)
        - Novel and simple stimuli (BI Team, 2014)
        - Personalization (BI Team, 2014)
    - Timing of an intervention: Strategic selection of when to execute the intervention or action to maximize its effectiveness (Hansen, 2019)
    - Physical environment cues: stimuli or signals that prompt specific behaviors, attitudes, or responses in the target audience (World Bank, 2015)
    - Relevant state of mind: Encourage the decision when there is an optimal mental state to make it [not when hungry or tired] (Hansen, 2019)
    - Guide search: Help people navigate information, so it is easier to process it. (Hansen, 2019)
        - Searching by aspects (Hansen, 2019)
        - Question trees (Hansen, 2019)
    - Adapt to heuristics: Mirroring the public's intuition (Hansen, 2019)

- Memory
    - Reminders: Drawing attention to particular information or task (Hansen, 2019; World Bank, 2015)
    - Prompts: Signal to evoke a particular response or behavior (Hansen, 2019)

    - Checklists: Structured list of tasks used as a cognitive tool to systematically organize, monitor, and manage complex processes (Thaler & Sunstein, 2021)

- Emotionality
    - Consider motives: Examining the underlying motivations that drive behaviors and decision-making (Hansen, 2019)
    - Create perspective: Offering alternative viewpoints or frames of reference (Hansen, 2019)
    - Trigger emotions: Evoking specific feelings or emotional responses through stimuli presentation (Hansen, 2019)

- Consequence reinforcing
    - Make short-term benefits evident for long-term commitment: Highlighting immediate rewards of engaging in the desired behavior (World Bank, 2015)
    - Small wins: Achieving incremental, modest, and most likely immediate successes or accomplishments (World Bank, 2015; Weick, 1984)
    - Gains segregation: Profit division into distinct categories to optimizing the use of resources (Thaler & Sunstein, 2021)
    - Frame prospects: Framing the loss not in absolute terms but attaching it to a reference point the target audience can relate to (Hansen, 2019)
    - Commitment devices: Tools used to public or privately pre-commit, helping the target audience follow their action plan (Hanse, 2019; World Bank, 2015; BI Team, 2014)

        - Implementation intentions (Thaler & Sunstein, 2021)
    - Financial incentives: Rewards offered to individuals as motivation or encouragement to display the desired behavior (BI Team, 2014)
        - Gifts (World Bank, 2015)
        - Making products convenient (World Bank, 2015)
        - Timing of cash transfers (World Bank, 2015)
        - Lowering/zero action cost (World Bank, 2015)
        - Conditional cash transfers (World Bank, 2015)
        - Employ capitalized payments (Powell et al. 2012)
        - Impose penalties (Powell et al. 2012)
    - Lotteries: Reward system where the target audience has the chance to win prizes if displaying the desired behavior (Thaler & Sunstein, 2021; BI Team, 2014)
    - Reward programs: Structured systems that offer incentives, to the target audience based on their behavior (Thaler & Sunstein, 2021)
    - Accentuate the shortage or scarcity of the consequence of the conduct: Emphasizing the limited availability of the potential outcomes associated with a behavior (BI Team, 2014)
    - Relate the behavior to self-images: Connecting the target audience's behaviors or choices to their perception of themselves (BI Team, 2014)
    - Gamify activities: Incorporating elements of game design, such as competition, challenges, and rewards into non-game contexts or activities (Thaler & Sunstein, 2021, p.130; BI Team, 2014)

- Education
    - Performance-based techniques: Interventions that focus on improving specific skills, abilities, or behaviors (Biscoe & Aboud, 2012)
        - Inform and model the behavior (World Bank, 2015; Biscoe & Aboud, 2012)
        - Give feedback (World Bank, 2015; Biscoe & Aboud, 2012)
        - Modelling/demonstrations (Biscoe & Aboud, 2012)
        - Rehearsals of the behavior (Biscoe & Aboud, 2012)
        - Identification of cues to action (Biscoe & Aboud, 2012)
    - Increase of perceived self-efficacy to perform the action: Strategies or aimed at boosting the target audience' belief in their ability to successfully execute a specific behavior (World Bank, 2015)
    - Reinforce: Providing positive stimuli following a behavior to increase the likelihood of that behavior recurring in the future (World Bank, 2015)
    - Understand the decision context: Examining the circumstances, factors, and influences that shape an individual's decision-making process (World Bank, 2015)
        - Village immersion (World Bank, 2015)
        - Dogfooding (World Bank, 2015)
    - Assess effectivity: Evaluating the extent to which an intervention, strategy, or program achieves its intended objectives (World Bank, 2015)
    - Reframe beliefs: Restructuring the target’s audience's existing beliefs, attitudes, or perceptions (World Bank, 2015)

- Simplicity
    - Default option: Pre-set choices that are automatically applied unless the target audience actively selects an alternative – it should be reversible (Hansen, 2019; World Bank, 2015; BI Team, 2014)
    - Default rules/Automatization: Predefined guidelines that automatically apply in the absence of explicit instructions or choices (World Bank, 2015)
    - Prefilled-in formats: Templates that already contain some information or options provided (Thaler & Sunstein, 2021)
    - Reduce barriers/ Reduce the hassle-factor: Minimizing difficulties that impede the target audience from engaging in the desired behavior. Related with reducing Thaler and Sunstein (2021) concept sludge (Hansen, 2019; World Bank, 2015; BI Team, 2014)
    - Make it intuitive: Present the information in a way that resembles the content of the information or the layout, so it resembles the beliefs that constitutes the audience's mental models (Hansen, 2019)
    - Provide plans: Offering the target audience specific, detailed strategies or action steps to follow (Hansen, 2019)
    - Anticipate to the responses: Foreseeing the target audience's reactions and adjusting the interventions based on those possibilities (BI Team, 2014)
        - Deconstruct complex actions into simpler ones (BI Team, 2014)
        - Write an action plan (BI Team, 2014)
        - Structure "default" action plans (BI Team, 2014)

    - Takeaway massage early on the interaction: Presenting key information or insights at the beginning of the communication to capture attention and set expectations (BI Team, 2014)
    - Simple and adequate language: Use language that is aligned with the target audience (BI Team, 2014)
    - Reference point to reach out: Presenting clear information and pathways on where to obtain information (BI Team, 2014)
    - Relevant information: Reducing cognitive noise and confusion by presenting critical information only for the decision-making (BI Team, 2014)
    - Automatic escalation: Increasing gradually the complexity of a task (Thaler & Sunstein, 2021)

- Problem solving
    - Identification of facilitators: Recognizing factors that support or enable the desired behavior (Biscoe & Aboud, 2012)
    - Identification of internal or external barriers: Identifying obstacles that hinder the target audience from engaging in the desired behavior (Biscoe & Aboud, 2012)
    - Recognizing solutions to overcoming the barriers: Identifying strategies, that can effectively the obstacles to display the desired behavior (BI Team, 2014; Biscoe & Aboud, 2012)

- Timing

- Prompt people during major life events: Presenting cues to coincide with significant life transitions or events, capitalizing on increased receptivity (BI Team, 2014)
- Contemplate immediate costs and benefits: Considering the immediate advantages and disadvantages associated with the desired behavior (BI Team, 201)
    - Draw attention to immediate benefits (BI Team, 2014)
    - Avoid immediate costs (BI Team, 2014)

- Health BT
    - Adhering to the protocols: Consistently following established guidelines, procedures, or treatment plans in patient care (World Bank, 2015)
    - Bias education: Creating awareness in the healthcare sector to recognize, understand, and mitigate biases that may influence clinical decision-making (World Bank, 2015)
    - Trust-enforcement: Fostering and maintaining trust between healthcare providers and patients through transparent communication, empathetic care, and consistent delivery of evidence-based practices (World Bank, 2015)
    - Psychoeducation: Providing information, resources, and support to enhance their understanding of the health conditions, the treatment options, and the coping strategies (Dumesnil & Verger, 2009)
        - Mental Health Literature (Jorm et al., 1997)
        - Mental Health First Aid (Hadlaczky et al., 2014)