



Psychological science and its societal mission during the SARS-CoV-2 pandemic: The Motivation Barometer as an evidence-informed policy instrument in Belgium

Maarten Vansteenkiste¹ | Joachim Waterschoot¹ | Sofie Morbée¹ |
 Pascaline Van Oost^{2,3} | Mathias Schmitz³ | Olivier Klein² |
 Olivier Luminet^{3,4} | Vincent Yzerbyt³ | Omer Van den Bergh⁵

¹Department of Developmental, Personality and Social Psychology, Faculty of Psychology and Educational Sciences, Ghent University, Ghent, Belgium

²Faculty of Psychological Sciences and Education, Maison des Sciences Humaines, Université libre de Bruxelles, Bruxelles, Belgium

³Institute for Research in the Psychological Sciences, Université Catholique de Louvain, Louvain-la-Neuve, Belgium

⁴Fund for Scientific Research (FRS-FNRS), Brussels, Belgium

⁵Health Psychology, Faculty of Psychology and Educational Sciences, University of Leuven, Leuven, Belgium

Correspondence

Maarten Vansteenkiste, Faculty of Psychology, Department of Developmental, Personality, and Social Psychology, Ghent University, Henri Dunantlaan 2, B-9000 Ghent, Belgium.
 Email: Maarten.Vansteenkiste@ugent.be

The last authorship is shared by the last two authors.

Funding information

Belgian Ministry of Public Health; Special Research Fund of Ghent University, Grant/Award Number: BOFCOV2020000701

Abstract

Upon the outbreak of the SARS-CoV-2 virus, it was clear that the pandemic would not only entail physical but also psychological challenges and threats to individuals' sustained motivation, behavioral adherence, and mental health. To encourage the Belgian authorities to take these psychological aspects into account, the Motivation Barometer, a large-scale and dynamic survey, was launched in March 2020. Its purpose was to monitor cognitive, affective, and behavioral aspects of citizens' functioning across the pandemic, with special attention given to motivational and social factors. In the present review, we provide a description of the methodology of the Motivation Barometer, we synthesize the key findings emerging from the Motivation Barometer, we clarify how these findings were used in practice to the benefit of different societal stakeholders (i.e., the broader public, policymakers, intermediate-level organizations, and media), and we highlight its potential contribution for the management of other societal challenges (e.g., climate change, well-being). We conclude that the Motivation Barometer was a critical policy instrument during the SARS-CoV-2 pandemic in Belgium. It helped to bridge the gap between social scientists, policymakers, the media, and the general public, and, as such, allowed to demonstrate the incremental value of psychological sciences for society.

The outbreak of the SARS-CoV-2 virus required a swift, coordinated, large-scale, and efficient reaction of policymakers to contain its spread (World Health Organization, 2020). Policymakers around the world were quickly backed by scientific advisory committees, mainly consisting of a variety of biomedical experts (e.g., virologists, infectious disease experts, biostatisticians, epidemiologists, and the like; for an example in France, see Moatti, 2020). Despite the key role of people's behavior and sustained adherence to health recommendations to contain virus circulation, social scientists in general, and psychologists in particular, were underrepresented when it came to providing policymakers with evidence-informed and evidence-based advice (Kazak, 2020; Van Bavel et al., 2020). Nevertheless, policy decisions were clearly quite intrusive in people's lives (e.g., installing a perimeter that limited people's physical movement outside their house) and often even conflicted with people's basic psychological needs (e.g., limiting social contact is at odds with a psychological need for relatedness; Baumeister & Leary, 1995; Fiske, 2018; Ryan & Deci, 2017). Also, due to the unpredictable evolution of the virus, the lack of efficient vaccines in 2020, and the gradual roll-out of the vaccination program until mid-2021, citizens were required to maintain their adherence efforts over a long period of time.

To contribute to a preventive, evidence-based, and evidence-informed COVID-19 policy and to bring various psychological aspects of people's functioning to the attention of different societal stakeholders (i.e., the broader public, policymakers, intermediate-level organizations, and media), the Motivation Barometer project was developed. Specifically, the Motivation Barometer was a large-scale, dynamic monitoring system that tracked various aspects of individuals' psychological functioning across the pandemic. In total, more than a hundred measurement waves were launched with the first measurement wave taking place on March 19, 2020, one day after the start of the first lockdown in Belgium. The aim of the present narrative review is fourfold. First, we describe the methodology and organic development of the Motivation Barometer, thereby discussing the sociodemographic composition of the sample, and the way we collected, analyzed, and monitored the data. Second, we provide a review of the key findings emerging from this Motivation Barometer, thereby highlighting its theoretical value. Third, we discuss the societal role that the Motivation Barometer played for different stakeholders, thereby paying attention to facilitating factors, challenges, and obstacles in this process. Fourth, we argue that the Motivation Barometer constitutes an example as to how to address other behavioral and mental health-related societal challenges in the future. Although the Motivation Barometer project unfolded in the context of the Belgian situation, we also emphasize the generic aspects with relevance for other countries.

PART 1: DESCRIPTION OF THE MOTIVATION BAROMETER

Characteristics

The Motivation Barometer was a large-scale, online survey study that was regularly launched since the beginning of the pandemic. In line with the barometer metaphor, the instrument *repeatedly* and *dynamically* assessed the "psychological pressure" and "morale" of the population. Specifically, during the first 10 weeks of the pandemic, when Belgium was facing a strict lockdown, we launched daily surveys, with some participants being longitudinally followed up for 10 consecutive weeks (Brenning et al., 2022; Morbée et al., 2023). As the pandemic progressed, the pace of data collection slowed down and we adapted new data collection waves to accommodate emerging themes and concerns related to the particular phase of the pandemic. Each wave contained a combination of topical modules. Some modules were included on every occasion to assess the same set of variables (i.e., motivation, basic needs, and adherence to sanitary measures), while others were added ad hoc to address varying circumstances (e.g., attitude toward mandatory vaccination, mouth masks, conspiracy theories). This flexible and dynamic approach allowed us to provide a data-driven answer to questions about psychological topics that were of high importance to policymakers and the broader public.

The Motivation Barometer had a *broad scope*, both in terms of its content as well as target populations. Through a topical approach, we addressed a large variety of psychological themes, involving behavioral (e.g., adherence to measures), motivational (e.g., vaccination motivation), cognitive (e.g., risk perception), emotional (e.g., boredom), and social (e.g., loneliness, trust in authorities, conspiracy theories) aspects of individuals' functioning. The scope of studied populations was equally diverse, with special attention given to specific (vulnerable) groups, including students (Duprez et al., 2021), parents (Desimpelaere et al., 2023; Schrooyen et al., 2021; Wauters et al., 2022), older adults (Van der Kaap-Deeder et al., 2021), sportsmen (Morbée, Haerens, et al., 2021), and unvaccinated people (Morbée, Vansteenkiste, et al., 2022), next to the regular data collections targeting the broader public.

Further, in terms of *methodology*, the Motivation Barometer relied on a variety of research designs and statistical methods to collect and analyze findings. We used both cross-sectional cohorts (e.g., Van Oost et al., 2022) and longitudinal follow-up surveys (e.g., Waterschoot, Van Oost, Vansteenkiste et al., 2023), but also administered experimental designs in both a vignette format (e.g., Morbée, Waterschoot, et al., 2022) and in real-life intervention studies (e.g., Laporte et al., 2022).

Finally, the Motivation Barometer was strongly *theory-driven*, with various psychological frameworks providing the necessary foundation to gain insight into the psychological mechanisms at play. Although Self-Determination Theory (SDT; Ryan & Deci, 2017; Ryan et al., 2021) served as the guiding framework, a synergy was pursued with the literature on the role of risk perception, health communication, governmental trust, and conspiracy thinking. Due to this theory-driven approach, the Motivation Barometer went beyond a mere *symptom-based* and *descriptive approach* and analyzed which psychological processes could account for variation in important outcome variables. Hence, we aimed to understand *why* there was both between- and within-person variation in adherence to sanitary behaviors, well-being, and vaccination willingness. Through this in-depth investigation of psychological dynamics, we were able to better understand the variation in people's preference for different COVID-related policy options.

Growing societal impact

After an initial period during which we launched results into the national press, often followed by interviews of members of the research team, policy advisory committees started to solicit information obtained through the Motivation Barometer in a more direct manner to guide policy decisions. The fact that we wrote public reports about the psychological state of the population and about people's attitudes regarding "hot" topics at a particular moment contributed to this evolution. Besides providing an executive summary, these reports contained graphs of the findings, psychological contextualization, and various policy recommendations. From the early days of the pandemic, back in 2020, we made these reports available to scientific advisory boards, the national crisis center in charge of nationwide communication, the media, as well as to the different governmental authorities (federal state, regions, provinces). The first report came out on March 30, 2020 and no less than 40 reports followed (for an overview, see Appendix 1). We provided all relevant materials related to the project in three languages (i.e., Dutch, French, and English) on our dedicated website (www.motivationbarometer.com).

Over the course of the initial months, the "Barometer team" expanded in two ways. First, it was gradually joined by psychological experts from all major universities in Belgium located in both linguistic regions. Second, an expert group "Psychology & Corona" was established to gather weekly with both academic participants (including the senior academics involved in the Motivation Barometer project) and key representatives of professional organizations of psychologists. In this way, the psychological profession became an important and coordinated voice in the societal debate in both the French and Dutch language parts of the country, conveying empirical data and consistent interpretations, advice and opinions. In fact, the Motivation Barometer gradually became a nationwide "brand name" that was increasingly known by the population, the press, and policymakers.

Yet, it took until November 2020, that is, 6 months after the outbreak, before a psychologist (the first author of this paper) became a formal member of a key advisory committee of the government (i.e., Group of Experts of Management Strategy, GEMS), besides other members with a biomedical, economic, health promotion, or sociological background. This psychologist remained the sole behavioral expert on board until the advisory committee was no longer formally in charge (i.e., March 2022). However, several other psychologists from the Barometer team were regularly called to join a series of additional governmental groups (communication, well-being, vaccination task force, training of physicians) on an ad hoc basis.

Recruitment and analysis

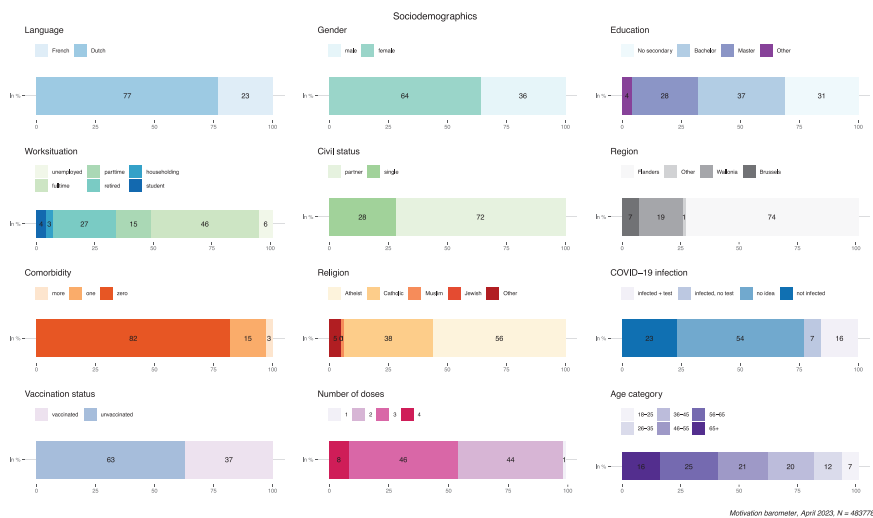
Although the Motivation Barometer was initially launched in Flanders, we quickly made the Dutch language questionnaire also available in French and included participants from the Brussels and Walloon regions. People were not paid to participate. Because of the lockdowns and the recommendation to restrict physical contact, we developed an online recruitment approach throughout the entire period. We placed ads on diverse social media channels (e.g., Facebook, LinkedIn) and collaborated with national newspapers (each targeting a different audience) that shared a call for participation on their websites. Newspapers were keen to collaborate as they were looking to inform their readers about the psychological impact of the pandemic. At the end of the questionnaire, participants could agree to be contacted on future occasions by leaving their e-mail addresses, thus providing the opportunity to chart longitudinal developments. In total, 483,778 surveys were completed (with at least a duration time of 200 s), from which 321,495 unique individuals (66.5%), spread across 110 waves with on average 2949 participants in each wave (range: 746–24,818) and an average length of 7 days between waves. Of this total sample, subsamples participated multiple times, with 32,156 persons having participated between 2 and 5 times, 7109 persons between 6 and 10 times, 2408 persons between 11 and 20 times, 345 persons between 21 and 50 times, and 7 participants even more than 50 times.

Obviously, this ad hoc recruitment resulted in nonrepresentative data. Only those with a computer and access to the Internet and social media or those reading the collaborating newspapers could participate in the study. Further, only motivated individuals participated, with these motives being very diverse (e.g., voicing one's dissatisfaction or signaling one's commitment). The sample was older, more female, more vaccinated, and more highly educated than the average Belgian population. Figure 1 shows a graphical overview of the sociodemographic composition of the entire sample.

In view of the possible bias in the recruitment of respondents, we avoided reporting on the absolute presence of attitudes (e.g., “How many people trust politicians?”) or refrained from directly comparing exact percentages between subpopulations (e.g., “Which proportion of young adults and elderly report symptoms of depression?”). When we did, potential bias was explicitly mentioned. Moreover, we applied a weighting procedure to adjust for age, gender, education level, and regional origin based on available population statistics for Belgium (Statbel, 2020–2022). The weighting procedure also adjusted for differences between collected samples across time. Obviously, these weighting procedures are not a perfect solution to imperfect data and may result in biased parameter estimations, especially when collected datasets are small (Haddad et al., 2022). In addition, other unknown, yet potentially relevant sociodemographic (e.g., income level) or psychological (e.g., motivation) variables may also have driven self-selection.

Communicating findings

Because of potential biases in the samples, we paid special attention to the way of analyzing, presenting, and disseminating findings. For example, rather than reporting on the absolute numbers and percentages, we focused on structural relations between measured or manipulated psychological



Motivation barometer, April 2023, N = 48378

FIGURE 1 Overview of the sociodemographic composition of the entire sample.

variables (e.g., communication style and motivation) or between sociodemographic and psychological variables (e.g., age and motivation), as these are less influenced by the potentially unrepresentative nature of the data. Further, we reported mainly relative changes over time to indicate shifts in people’s attitudes (e.g., attitude toward the COVID-19 certificate, which was required to enter specific public spaces). When characteristics were not used in the weighting procedure (e.g., vaccination status), we presented findings in a differentiated manner, thereby highlighting effect sizes of observed mean differences instead of the absolute occurrences of phenomena. Finally, when commenting upon the findings, we used careful wording to prevent readers from drawing inappropriate conclusions and provided narrative, theory-grounded interpretations to help citizens and policymakers make sense of the otherwise abstract findings.

PART 2: SYNTHESIS OF KEY FINDINGS

We developed three lines of research across time, focusing on (a) the role of (lack of) motivation in predicting short-term and long-term outcomes such as adherence to health regulations and vaccination, (b) the processes explaining within- and between-person variation in mental health, and (c) the contextual predictors relating to the explanatory mechanisms. Figure 2 provides an overview of the validated theoretical model that guided the research.

Theme 1: Motivation, risk perception, and behavioral adherence

Quality of motivation

A first key theme concerns the commitment of the population to adhere to the sanitary measures and to accept a vaccine. We studied the predictive validity of individuals’ type and level of motivation for adherence as well as the proximal predictors relating to people’s motivation (i.e., risk perception; see middle part of Figure 2). We adopted a theory-grounded approach rooted in SDT (Ryan et al., 2021), which distinguishes different reasons for adherence that fall along a continuum of increasing self-endorsement or internalization (Vansteenkiste et al., 2018). In the case of *external regulation*,

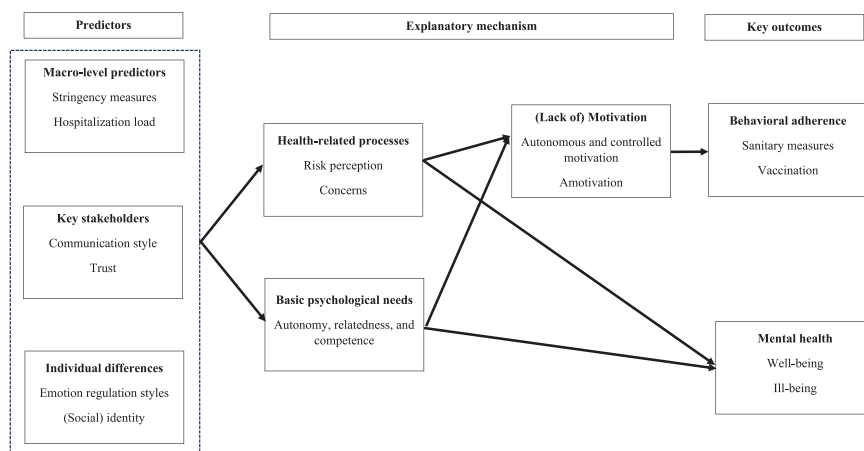


FIGURE 2 Guiding theoretical framework.

the reasons for performing the recommended health behavior is driven by external factors, such as meeting others' expectations, receiving a reward, or the avoidance of threats and punishments. The person merely feels pushed into the activity without having internalized the reasons for it, such as when a person wears a mouth mask to avoid getting a fine. Next on the continuum is *introjected regulation*, reflecting partial internalization. In this case, the behavior is regulated by internal pressures and evaluative contingencies, such as the avoidance of guilt, shame, or anxiety or the boosting of one's ego. A person accepting a vaccine to avoid feeling guilty about not performing a civil duty displays introjected regulation. A more volitional or autonomous form of regulation is achieved when individuals perceive the health behavior as personally meaningful and relevant, such that they identify with its importance. A person who understands that getting vaccinated will allow society to gradually move out of the crisis displays *identified regulation*. In the case of *integrated regulation*, the most internalized form of motivation, the reason for engaging in the health behavior is value-based and experienced as self-endorsed and volitional. A person who sticks to the measures to reduce virus circulation so as to protect vulnerable people from getting infected displays integrated regulation. As identified and integrated regulation often co-occur in daily reality and both denote volitional forms of motivation, they have been studied under the notion of autonomous motivation.

A series of studies focused on the role of these different types of regulation, with the number of examined subtypes somewhat varying between studies. Although these studies initially considered the level of internalization underlying the adherence to sanitary measures (e.g., wearing a mouth mask, keeping physical distance), we studied people's motivation for vaccination once vaccines became available early 2021. A converging set of findings emerged across the type of studied health behavior: People's quality of motivation matters. While autonomous regulation predicted both concurrent and future adherence to sanitary measures, introjected regulation only yielded short-term benefits and external regulation was found to come with negative outcomes in the longer run (Morbée, Vermote, et al., 2021). Importantly, in a cross-cultural investigation involving 89 countries (Legate et al., 2022), autonomous regulation positively predicted the intention to adhere to physical distance measures (see also Guay et al., 2021; Magrin et al., 2023).

Autonomous regulation did not only predict self-reported behavior, but also objectively registered infection rates several weeks later. Specifically, making use of data collected during the first 12 months of the crisis and relying on time series analysis and multilevel structural equation modeling, Waterschoot, Morbée, Yzerbyt, and colleagues (2023) reported that autonomous regulation on a given day predicted lower infection rates 6 weeks later (and vice versa). In turn, infection rates predicted hospitalization rates another 10 days later. An opposite pattern emerged for external regulation, which

predicted increased infection rates 6 weeks later. These findings provide strong support for the role of motivation as a *precursor* of the epidemiological situation and, hence, as a critical target for intervention and communication. That is, if policymakers want to avoid an increase in infection rates, they should maximally support citizens' self-endorsement and autonomous motivation for adherence.

A similar pattern of findings materialized for vaccination. Autonomous regulation for vaccination predicted concurrent vaccination intentions as well as future self-reported behavior, including the subscription to a waiting list, effective vaccine uptake (Schmitz et al., 2022), and the intention to take a booster and annual vaccine after 8 and 13 months (Waterschoot, Van Oost, Vansteenkiste, et al., 2023). Interestingly, although external regulation was slightly positively related to vaccine uptake (Schmitz et al., 2022), the effect became slightly negative when predicting the intention to accept a booster or annual dose, suggesting that the encountered pressure around vaccination backfired over time (Waterschoot, Van Oost, Vansteenkiste, et al., 2023). The differential role of autonomous and external regulation for vaccination also manifested when predicting people's shifts in vaccination intentions across the first year of the vaccination roll-out (Waterschoot, Van Oost, Schmitz, et al., 2023). To the extent that people more fully internalized the value of being vaccinated, their intentions for vaccination evolved in a parallel, positive manner; while an increase in external regulation predicted a concomitant reduction in vaccination intention across time. These benefits of increasing self-endorsement turned up, especially for those who initially had low vaccination intentions.

These findings convincingly show that citizens need to internalize the personal and societal significance of public health regulations to engage in them on the long term. This body of work echoes prior work in the healthcare domain with more selective populations (e.g., obese or diabetic patients; Sénécal et al., 2000; Williams et al., 1996), while extending it to a population level. One interesting observation in this context concerns the role of introjected motives, such as guilt, ego-enhancement, and moral duty. Although introjected regulation typically falls midway between external and identified regulation on the internalization continuum in other life domains (e.g., education; Howard et al., 2021), it was positioned more closely to identified regulation in the case of adherence to sanitary measures (Morbée, Vermote, et al., 2021). Presumably, as the health of (significant) others could be impacted by people's careless behavior, introjected reasons (e.g., guilt, moral duty) became closely intertwined with personal values. When public health is at stake, guilt may carry informational value, enabling one to get closer to one's personal values and to make well-informed and volitional decisions about how to behave in public (see also Vansteenkiste et al., 2014). The positioning of guilt on the internalization continuum may also be partially culturally driven, with introjected regulation further shifting to the more volitional side of the continuum in a culture that values group harmony and loyalty vis-à-vis family members (see Chen et al., 2016; Furukawa et al., 2012).

Lack of motivation

We distinguished two types of amotivation, one being distrust- and the other effort-based, when studying people's vaccination intentions (Schmitz et al., 2022). Distrust-based amotivation reflects people's general doubts to accept a vaccine, which can stem from different sources, including doubts about vaccine safety and efficiency and its potential side effects. Effort-based amotivation is at stake when citizens may not have sufficient resources available (e.g., physical or mental energy) to engage in behaviors required for vaccination. Distrust-based amotivation was negatively related to the intention to accept a vaccine, both concurrently (Schmitz et al., 2022) and several months later when people were probed for their intention to accept a booster or annual dose (Waterschoot, Van Oost, Vansteenkiste, et al., 2023). Also, an increase in distrust-based amotivation over time prevented citizens from moving toward greater vaccination. Instead, it explained their increasing reluctance over time (Waterschoot, Van Oost, Schmitz, et al., 2023).

Further, effort-based amotivation appeared unrelated to people's vaccination intentions (Schmitz et al., 2022; Waterschoot, Van Oost, Vansteenkiste, et al., 2023), presumably because it was relatively

effortless for citizens to get a vaccine in Belgium, as vaccination centers were within close distance and the logistic process ran rather smoothly (see also Morbée, Waterschoot, et al., 2022). The low prevalence of effort-based amotivation may not be observed in other nations, with effort-based amotivation then potentially yielding a different effect. Profiling analyses that aim to identify different groups of individuals, each characterized by a particular combination of reasons for (not) getting vaccinated, slightly nuance these findings. Citizens who score high on effort-based amotivation only express lower intentions to accept a booster or annual dose compared to motivated groups, yet, their intentions are higher than those of groups characterized by the presence of distrust-based amotivation (Waterschoot, Van Oost, Vansteenkiste, et al., 2023). Overall, such profile analyses indicate that unvaccinated individuals are rather heterogeneous.

Risk perception

Given the critical role of internalized motivation, various Motivation Barometer studies addressed the role of risk perception as a major driver. *Risk perception* includes two aspects, namely one denoting the likelihood or probability of becoming infected by the virus and the other denoting the anticipated severity of experienced symptoms and illness after infection. Both aspects can be assessed with respect to one's own health but also regarding the health of the general population (Van Scoy et al., 2022).

Although risk perception is a well-known concept in health behavior theories (Brewer et al., 2007), such as the health belief model (Champion & Skinner, 2008; Rosenstock, 1974) and the health action process approach (Schwarzer & Luszczynska, 2008), its role in fostering internalization of health behaviors received no prior attention. Such a link was established in various studies within the Motivation Barometer project, with risk perception underlying people's autonomous regulation for both sanitary measures (Waterschoot, Vansteenkiste, et al., 2023) and vaccination uptake (Schmitz et al., 2022). Interestingly, when we allowed both aspects of risk perception to compete for unique variance in autonomous regulation, only the severity aspect yielded a facilitating effect. Notably, risk perception was not a stable "entity," but varied across time as a function of changing hospitalizations (Waterschoot, Vansteenkiste, et al., 2023). Given the sensitive nature of risk perception, the internalization of sanitary measures also got strengthened and plummeted as a function of shifting risk levels. Elevated risk provided an appropriate and convincing reason to adhere to the measures. However, whenever the risks waned, sanitary measures were easily experienced as disproportionate and, hence, inappropriate, leading to externally regulated behavior.

Further, the internalization-enhancing role of risk severity appeared robust, as it emerged regardless of the circulating variant (i.e., alpha, delta, omicron) and was observed among both vaccinated and unvaccinated individuals (Waterschoot, Vansteenkiste, et al., 2023). The latter findings should be considered against the background that unvaccinated individuals perceived on average less risk for severe illness, which helps explain their lowered autonomous motivation and greater reluctance for vaccination (Waterschoot, Vansteenkiste, et al., 2023).

Summary

Three conclusions emerge from the research on the role of motivational dynamics. First, the quality of motivation for health behavior is a critical predictor of people's short- and long-term adherence to public health regulations, creating a challenge for policymakers to foster the internalization process as regards the sanitary measures. Second, citizens have different reasons for being unmotivated to accept vaccination, with distrust-based amotivation being the strongest and most predictive barrier to accept the vaccine. Finally, although risk perception, and in particular the severity of perceived risk, serves as a critical antecedent of internalization, it does fluctuate across time, with resulting implications for people's volitional versus more pressured adherence to health regulations.

Theme 2: Mental health

People's mental health was under threat at different moments during the SARS-CoV-2 pandemic (e.g., Hansen et al., 2021), with especially teenagers and young adults reporting greater ill-being throughout the pandemic (Panchal et al., 2023). We monitored people's mental health, using both indicators of well-being (i.e., life satisfaction, vitality) and ill-being (i.e., symptoms of depression, anxiety, and poor sleep quality). Mental health was undermined as a result of chronic health concerns (Trogakos et al., 2020) and because of the frustration of basic psychological needs for autonomy, competence, and relatedness (Vermote et al., 2022). These two explanatory mechanisms in the central part of our model help to understand which subgroups in society were more vulnerable to poor mental health (see Figure 2; Rudert et al., 2021). In an attempt to shed light on the heterogeneity in people's mental health, several studies also looked at the factors playing a buffering role, including the role of emotion regulation.

Concerns

Concerns can be defined as uncomfortable states of insecurity, uncertainty, and apprehension (Ma & Christensen, 2019). In the context of the pandemic, people's concerns with respect to their own and others' health and about the uncertain evolution of the situation itself were most relevant (e.g., Charilaou & Vijaykumar, 2023). Different factors influenced health concerns, including the threat of insufficient hospital capacity to accommodate new patients (Fiorillo & Gorwood, 2020), the daily media reports of infections, hospitalizations, and mortality numbers (Bou-Hamad et al., 2021), and an infection of oneself or close others (Levine et al., 2022). A series of studies focused on the effect of concerns and the factors buffering and amplifying its effect.

A week-to-week study, conducted in the first 10 weeks of the crisis (Brenning et al., 2022), indicated that people reported higher ill-being and lower well-being in weeks when COVID-19 related concerns were peaking. Further, individuals who tended to make greater use of either emotional dysregulation (i.e., expressing emotions in an impulsive and disorganized way) or emotional suppression (i.e., the avoidance or minimization of negative emotions; Gross, 2015; Roth et al., 2019) as their habitual way of emotion regulation were more vulnerable for symptoms of ill-being across the entire period. Interestingly, between-person differences in emotional dysregulation amplified the strength of the within-person association between weekly concerns and weekly depressive complaints and lowered life satisfaction. A similar amplifying role surfaced for integrative emotion regulation, with a weekly increase in concerns being more strongly associated with a weekly increase in anxiety. Presumably, the emotional receptivity and interest-taking stance characteristic of emotional integration (Roth et al., 2019) helped individuals to attend more fully to their health concerns, which may explain why they temporarily experienced elevated anxiety. Notably, this temporary increase in concerns did not translate into a temporary increase in symptoms of depression (see also Roth et al., 2014). The findings of this week-to-week study are consistent with another cross-sectional study conducted during the first lockdown in March 2020 that identified different profiles of emotional regulation, with a group combining dysregulation and suppression reporting the poorest mental health and sleep quality compared to a group scoring high on integrative regulation and a group scoring low on any emotion regulation style (Waterschoot et al., 2022).

In another study (Van de Castelee et al., 2022), using a quasi-experimental method, we examined whether the weekly analysis of morning saliva to identify SARS-CoV-2 infections would serve as a buffer against the emergence of concerns. The study took place among school personnel at the moment several SARS-CoV-2 clusters broke out in schools, thereby threatening in-person education. Saliva testing attenuated a rise in health concerns among tested school personnel but did not affect

participants' general well-being, with the sharpest decreases in health concerns observed in schools where the school personnel was very supportive of the initiative.

Basic psychological needs

The SARS-CoV-2 crisis did not only affect individuals' concerns, but also threatened the satisfaction of basic psychological needs for autonomy (i.e., experiencing a sense of choice and volition), competence (i.e., experiencing a sense of mastery and effectiveness), and relatedness (i.e., experiencing a sense of connection and mutual care), which are considered essential nutrients for mental health not only within SDT (Ryan et al., 2021; Vansteenkiste et al., 2020) but also more generally (Fiske, 2018). As such, these threats may engender frustration of the basic needs, resulting in experiences of pressure and inner conflict (autonomy need frustration), loneliness (relatedness need frustration), and inadequacy (competence need frustration). To illustrate, when citizens faced the various imposed health regulations (e.g., to self-isolate and work from home), several among them likely experienced less autonomy and relatedness satisfaction than usual. During the lockdown, some people doubted their capacity to harmonize different roles (e.g., parent, teleworker, homeschool teacher), thereby experiencing competence frustration. At the same time, periods with more stringent measures may also have offered opportunities for enhanced need satisfaction, with people having more time to pursue their personal interests (autonomy) or investing in their skills (competence) due to a reduction in social commitments, becoming creative in connecting with others through digital channels or by participating in collective activities that fostered a sense of mutual care and group and social identity (relatedness). Overall, the effects on basic needs were quite heterogeneous, both across people and across time (e.g., Meulenbroeks & van Jaoling, 2022; Samsen-Bronsveld et al., 2023).

The role of concerns and basic needs was examined in a variety of ways in the Motivation Barometer project. First, we examined the role of basic needs and concerns as competing predictors of mental health, thus shedding light on their respective main effects (Vermote et al., 2022). As the effects of basic needs are said to be pervasive (Vansteenkiste et al., 2020), need satisfaction should play an important predictive role in both peaceful and stable conditions, such as during leisure time or vacation (Campbell et al., 2018), as well as in distressing and destabilizing times like the pandemic. After controlling for concerns, basic need satisfaction was uniquely positively associated with people's mental health, suggesting that need satisfaction is not a luxury product reserved only for peaceful times (see Maslow, 1954). The growth-fostering role of basic need satisfaction during the SARS-CoV-2 pandemic was equally observed in other studied populations, including parents (Desimpelaere et al., 2023; Schrooyen et al., 2021), students (Chiu, 2022; Duprez et al., 2021), and the elderly (Van der Kaap-Deeder et al., 2021; Vermote et al., 2023). In the latter group, the salutary effect of need satisfaction emerged regardless of individuals' age, educational level, gender, and perceived income among other factors (i.e., 9 in total), confirming the robust role of need-based experiences.

A longitudinal study, involving 13 measurement moments spanning 2 years of the pandemic, examined whether need satisfaction can serve as a source of resilience when people encounter health-threatening events (Waterschoot, Morbée, Soenens, et al., 2023). Two sets of findings speak to this issue. First, after controlling for exposure to actual health threats, need satisfaction, both at the between- and within-person level, predicted negatively felt health concerns, suggesting that need satisfying experiences allow one to maintain a positive outlook on events despite their distressing nature (i.e., appraisal effect). Second, felt health concerns were less predictive of symptoms of depression and anxiety when people reported higher need satisfaction compared to others (i.e., between-person level) or when they reported periodically more need satisfaction than usual (i.e., within-person level), suggesting that need satisfaction allows one to better cope with adverse circumstances.

Given the growth-fostering and resilient role of basic needs during distressing times, we developed two successful e-health interventions to foster need crafting, need satisfaction, and mental health in

both adults (Laporte et al., 2022) and university students (van den Bogaard et al., 2023; see also Cantarero et al., 2021).

Vulnerable groups

The process of basic psychological needs also helps to explain why some groups in society suffered more strongly from the crisis. The reason why young adults, relative to older generations, reported poorer mental health was due to the stronger frustration of their basic needs for relatedness and autonomy (Waterschoot, Morbée, Soenens, et al., 2023). Also, the increasing polarization observed in society between vaccinated and unvaccinated persons (de Figueiredo & Larson, 2021) and the rebellious attitude of some unvaccinated persons against the COVID-19 policy during the winter of 2021 could be accounted for by the increasing social exclusion and autonomy frustration experienced by these persons (Waterschoot, Yzerbyt, et al., 2023). Indeed, our data revealed that the introduction of the COVID-19 certificate frustrated the needs for autonomy and relatedness of unvaccinated persons relatively more and accounted for reactance (Van Petegem et al., 2015).

Summary

Studies shedding light on individuals' mental health point toward the following two conclusions. First, on top of the damaging impact of concerns, the frustration of the basic needs plays a detrimental role, suggesting their satisfaction is not merely a luxury good fostering mental health in times of prosperity. Second, the effect of concerns on ill-being is amplified among individuals who tend to dysregulate their emotions but can be partially buffered via increased frequency of SARS-CoV-2 testing and elevated need satisfaction.

Theme 3: Contextual predictors

A third line of research focused on the role of contextual factors relating to people's felt concerns, basic needs, and motivation (i.e., left side of Figure 2; Klein & Yzerbyt, 2023). While some of these studies focused on distal, objectively recorded predictors at the societal or macro-level (i.e., hospitalization load and stringency of the measures), other efforts zoomed in on the role of perceived trust in political authorities, scientific experts, and health workers or the perceived communication style of health-care providers, thus shedding light on the impact of more proximal influences. Last but not least, we also investigated the role of social factors that are associated with lower vaccination rates, such as adherence to conspiracy theories (Bruder & Kunert, 2022; Douglas, 2021; Hornsey, 2020; Pummerer et al., 2022) and attitudes toward alternative medicine (Hornsey et al., 2020).

Hospitalization load and stringency

Given the frequent assessment of people's motivation, we could examine the link between hospitalization load and motivation at a population level (Waterschoot, Vansteenkiste, et al., 2023). Building on data spanning from July 2020 till March 2022 ($N = 241,275$), multilevel analyses revealed that on days with higher hospitalization load, people reported higher autonomous motivation to adhere to sanitary measures, with this elevated identification explaining why citizens reported more behavioral adherence on these days. As indicated in Figure 2, risk perception helps to explain why people report higher autonomous motivation on days with higher hospitalization rates. Specifically, the severity aspect of risk perception accounts for the positive association between daily variation in hospitalization load and daily variation in autonomous motivation.

Another long-term investigation, spanning 421 days of the crisis between March 2020 and March 2022, showed that the effect of hospitalization load fully depends on the stringency of the implemented measures (Waterschoot, Morbée, Van den Bergh, Yzerbyt, et al., 2023). What especially appears critical is the *proportionality* between stringency and hospitalization load, with a balance between both required to generate positive or, alternatively, avoid negative effects on motivation, basic needs, and mental health. Specifically, when either strict or lenient measures are disproportionate to the epidemiological situation, people reported lower need satisfaction, lower autonomous motivation, more controlled motivation and amotivation, less adherence to sanitary measures, and higher anxiety and depressive symptoms. Such findings make clear that stringent measures are not *per se* demotivating or compromising of people's well-being, nor are lenient measures as such motivating or enhancing well-being.

Conceptually, these findings point toward the critical difference between *freedom* and *autonomy* (Ryan & Deci, 2006, 2017). Although behavioral restrictions, such as those imposed during the pandemic, limit individuals' freedom, people can still preserve a sense of autonomy or volition in adhering to them as far as they can endorse their value (see Ricoeur, 1966). To the extent that people's perceived risk to become severely ill from a SARS-CoV-2 infection was high, they were willingly following imposed health regulations. Presumably, under these conditions, people perceive it as legitimate that authorities intervene and impose regulations as these are meant to promote (collective) safety (Tyler, 2006; Van Petegem et al., 2021). Thus, while safety goals may at some point conflict with people's freedom, it does not impede autonomy as people can willingly adhere to safety regulations. Which measures exactly are perceived as proportionate relative to prevailing risks in society may be partially culture-bounded. Citizens from more collectivistic oriented societies, which value collective goals and social harmony, may be more likely to accept stringent measures in comparison with citizens from individualistic societies (Cheek et al., 2022). The same rationale may also hold for tight as opposed to loose countries (Gelfand et al., 2021).

Yet, at times, political authorities were afraid to take stringent measures because they anticipated that people would resist. This was the case in November 2020 in Belgium, a moment when it became clear that the Belgian population would not be able to enjoy Christmas and New Year festivities in an extended family context. To guide the government in making an evidence-based decision, we set up a vignette study (Waterschoot, Morbée, Van den Bergh, & Vansteenkiste, 2023) to assess people's attitudes toward various policy options that varied in the number (i.e., one, two, four) of allowed close contacts (i.e., contacts at less than 1,5 physical distance). A "carte blanche" scenario with people being allowed to have an unlimited number of close contacts appeared to be the least preferred option. Yet, younger (relative to older) respondents and those without (relative to those with) a partner preferred meeting a greater number of close contacts during the Christmas and New Year break in 2020, because they expected additional close contacts to increase their sense of relatedness and autonomy. Instead, those with higher autonomous motivation and higher risk perception objected to a greater number of close contacts as they expressed greater health concerns under these circumstances. These findings suggest that the relation between the stringency of measures and motivation and risk perception is reciprocal. When presenting these findings to policymakers, we made clear that the population was not expecting to celebrate Christmas and New Year as they were used to and suggested them to allow individuals, especially those living alone, to have two extra visitors at home, given the anticipated psychological benefits of such a decision.

COVID-19 certificate

One policy instrument that was increasingly introduced in Europe by political authorities in the summer of 2021 was a COVID-19 certificate or green pass. The COVID-19 certificate, referred to as a COVID Safe Ticket (CST) in Belgium, served as an "entrance ticket" to participate in public activities. European countries differed widely in the scope of these activities, with some countries being

rather selective (e.g., traveling purposes, big concerts) and other countries (e.g., Israel; Saban et al., 2021) implementing the pass across different life domains (e.g., as a requirement for entrance to restaurants, pubs). In most countries, citizens could obtain the pass based on vaccination or recovery from a recent SARS-CoV-2 infection. Yet, over time, some countries began to use the COVID-19 certificate more restrictively, with a recovery from a recent infection no longer serving as a valid alternative for vaccination.

In our assessments, we moved beyond merely assessing people's general attitude toward the COVID-19 certificate but adopted a domain-differentiated approach and, more importantly, also assessed the *functional significance* or psychological meaning (Ryan & Deci, 2017) attributed to the pass, which was expected to affect its perceived legitimacy. To the extent that the certificate came across as a safety-preserving tool, it predicted a more positive attitude. In contrast, when individuals perceived the certificate as an autonomy-constraining instrument, they adopted a more negative attitude toward its usage (Waterschoot, Yzerbyt, et al., 2023). Interestingly, the perceived safety-enhancing versus autonomy-constraining meaning of the pass and the associated acceptance or resistance against the pass was not static but it dynamically varied as a function of perceived risk severity. At moments when the risk for illness was more prevalent, the safety-enhancing meaning was more salient and the pass was more readily accepted, at least among vaccinated persons. Unvaccinated persons instead perceived the autonomy-constraining role to be more salient, in large part because they perceived fewer risks for infection and illness overall (Waterschoot, Yzerbyt, et al., 2023).

In January 2022, when a contagious, yet less ill-making variant (i.e., Omicron) started to circulate, Belgian authorities revised their COVID-19 vaccination policy. They considered discontinuing the use of the COVID-19 certificate and instead making vaccination mandatory. To assess the level of support in the population for different policy measures, we set up a vignette study investigating the expected psychological benefits and pitfalls of the COVID-19 certificate and mandatory vaccination as a function of people's vaccination status and risk perception (Brisbois et al., 2023). Specifically, we created different hypothetical scenarios varying in stringency, ranging from the discontinuation of the COVID-19 certificate to making vaccination mandatory for all citizens. Data collected from a large sample of Belgian participants ($N = 12,670$) indicated that the vast majority of participants favored the discontinuation of the COVID-19 certificate over any of the three other restrictive scenarios. One group of participants deviated from this general pattern, namely individuals with high perceived risks who had received three doses of vaccination. They feared the elimination of the COVID-19 certificate the most and indicated that restrictive policies would entail various psychological benefits (e.g., higher relatedness and autonomy, lower concerns). These findings, which were presented in the Belgian parliament to inform legislators' views on mandatory vaccination, shed light on the core role of risk perception and vaccination status in predicting attitudes toward the COVID-19 certificate and vaccination policies and helped policymakers in taking an informed decision whether to (dis)continue the use of the COVID-19 certificate or to mandate vaccination.

Communication style

A series of studies shed light on the communication of health messages by public health officials and on how health care workers talked with their patients about health-related decisions. These studies took place at different moments during the pandemic, depending on the health issue at stake, with studies focusing on how to communicate to keep physical distance in the early stages of the crisis (Legate et al., 2022), to encourage individuals to take a vaccine at the start of the vaccination campaign (Morbée, Waterschoot, et al., 2022) and to enter into a dialogue with unvaccinated persons when the vaccination campaign was being rolled out (Morbée, Vansteenkiste, et al., 2022).

One large cross-country experiment (Legate et al., 2022), involving 89 countries across the globe, examined the differential role of a written autonomy-supportive message that fosters a sense of choice and agency to adhere to physical distance measures relative to a no-message control group and a

controlling message that used pressuring and shaming language. The study provided partial support for the differential effectiveness of different types of messages in that a controlling message increased controlled motivation relative to no message and an autonomy-supportive message. Yet, messages did not influence behavioral intentions, which were primarily predicted by baseline differences in autonomous motivation. The authors suggested that participants had already been bombarded with hundreds of messages at the time they participated in the study, such that they had already endorsed the value of keeping distance. In favor of this explanation, the authors found that the effects of autonomy-supportive and controlling messaging were somewhat stronger in countries where the study took place within 30 days of their country first enacting policies aimed at promoting physical distancing (see also Bradshaw et al., 2021; Legate & Weinstein, 2022).

To help policymakers frame the Nationwide vaccination campaign, we set up a large vignette-based study in January 2020 ($N = 15,901$), with different facilitating and hindering factors being manipulated (Morbée, Waterschoot, et al., 2022). In terms of communication, highlighting that most citizens are willing to get vaccinated and emphasizing the protective benefits for others yielded a positive effect on participants' vaccination intentions. Because we obtained these findings when the vaccination campaign still needed to start, the question was whether these two communicative aspects would have yielded the same effect later in time. Indeed, among hesitant or refusing individuals, the framing of vaccination as a normative and pro-social deed may potentially come across as guilt-inducing and egoistic, thereby driving them away from vaccination and even eliciting polarization in society.

The importance of communication in relation to unvaccinated persons emerged via another vignette study, that we conducted in June 2021 among unvaccinated persons only ($N = 1918$; Morbée, Vansteenkiste, et al., 2022). The vaccination campaign was then rolled out at full speed and every citizen, except for the younger generations, had been invited for vaccination. Unvaccinated persons needed to imagine themselves in a situation where they would engage in a dialogue with a health care worker about their vaccination intentions, who adopted either an autonomy-supportive (i.e., validating the person's frame of reference, following the rhythm of the unvaccinated person) or a controlling (i.e., using guilt-inducing and pressuring language) communication style. Autonomy-supportive communication fostered greater autonomy satisfaction, came across as more effective, and prompted somewhat greater reflection about vaccination but did not enhance vaccination intentions compared to controlling communication. Apart from communication style, also the use of a voucher as a rewarding strategy was manipulated, but failed to influence any of the outcomes in this group of unvaccinated persons.

The study elicited a lot of interest among health care organizations (e.g., associations of GPs and pharmacists) and served as a basis for training health care providers in communicating with patients. The study also raised conceptual and ethical questions, including the question of what autonomy support really involves and whether unvaccinated individuals should enjoy unlimited freedom to pursue their own goals. Conceptually, autonomy-supportive health care providers do not try to talk an unvaccinated person into vaccination, whether via more subtle (e.g., convincing) or more clear-cut (e.g., guilt-induction) strategies. Rather than trying to be seductive, let alone manipulative, autonomy-supportive health care providers truly validate and carefully listen to the unvaccinated persons' pros and cons for vaccination. Although autonomy-supportive agents transparently provide scientifically supported information regarding the efficacy or side effects of vaccines, they ultimately leave the decision for vaccination to the patient him- or herself. Unvaccinated persons are encouraged to reflect on the matter and to eventually come to a well-informed and self-endorsed decision.

Trust

The communication style of political authorities and health care providers undoubtedly also affected participants' trust in them, a topic central in a large number of investigations (Larson et al., 2018; Klein & Yzerbyt, 2023). In the case of trustful relations, individuals are ready to willingly submit to

the actions of the trusted party without desiring to control or to monitor them (Mayer et al., 1995). A perception of trust arises when citizens have the expectation that authorities are competent (e.g., can deliver safe and efficient vaccines), benevolent (e.g., are careful when communicating potential side effects of a vaccine), and truthful (e.g., convey accurate information about the vaccine). While government trust was a positive predictor of COVID-19 vaccination intention, belief in conspiracy theories was a negative predictor (Van Oost et al., 2022), with respondents' vaccination motivations mediating these relations (see Figure 2). Specifically, when citizens expressed trust toward the political authorities, they experienced greater ownership around their vaccination decision, while conspiracy theories related to people's external regulation and distrust-based amotivation.

Although not empirically corroborated, it is reasonable to expect that perceived government trust also fosters greater internalization of sanitary measures, even rather strict ones. If citizens are more trustworthy toward political authorities, they may perceive sterner measures as more proportionate to the hospitalization rates and the perceived risks. Said differently, there may be interpersonal differences in people's threshold for perceived proportionality that dynamically vary as a function of their trust in governmental bodies. Conversely, one may more easily cling to conspiracy theories if measures are perceived as disproportionate and illegitimate, hence, interfering with the satisfaction of one's basic psychological needs for autonomy and relatedness.

The critical role of trust was established for medical experts (Van Oost et al., 2023). To the extent participants trusted medical institutions, they reported greater intentions to take the vaccine because they had better internalized the value of vaccination. In contrast, those holding to alternative medicine showed lower intentions to accept the vaccine because they scored higher on distrust-based amotivation. This endorsement of alternative medicine was thus found to be rooted in a human nature world view.

As a set, these findings point to the fact that the legitimacy and trustworthiness of a country's political (i.e., the government), moral (i.e., the media), as well as scientific authorities (i.e., the medical sector and the scientific community in general) play a critical role when hardship hits. In all likelihood, maximizing their impact is best served by having these institutions upholding the highest standards even in the absence of a crisis.

Summary

The work on contextual predictors shows that both the “what” (i.e., type) and “how” (i.e., communication style) of the various sanitary measures are critical to understand variation between people and over time in motivation, basic needs, and adherence. First, citizens do not expect authorities to take lenient measures when the medical situation is bad. Actually, what is needed are proportionate measures, that is, measures the strictness of which is in balance with the perceived risks indicated by the hospitalization load. Second, to foster reflection about and actual internalization of vaccination, health care workers would do well to adopt an autonomy-supportive, rather than a controlling communication style. Third, trust, both in political and medical authorities, contributes to greater vaccination intentions because one more readily sees and accepts the value of vaccination.

PART 3: SOCIETAL ROLE OF THE MOTIVATION BAROMETER

The overall aim of the Motivation Barometer was to help develop an evidence-informed and, whenever possible, an evidence-based policy with respect to various psychological challenges that the population was facing during the pandemic. It importantly helped to make clear to different stakeholders that the pandemic was not just a huge medical but also a psychological challenge. To this end, we used different communication pathways and channels to reach different stakeholders. As Figure 3 shows, the Motivation Barometer played a key role in the exchange of information between “Psychology

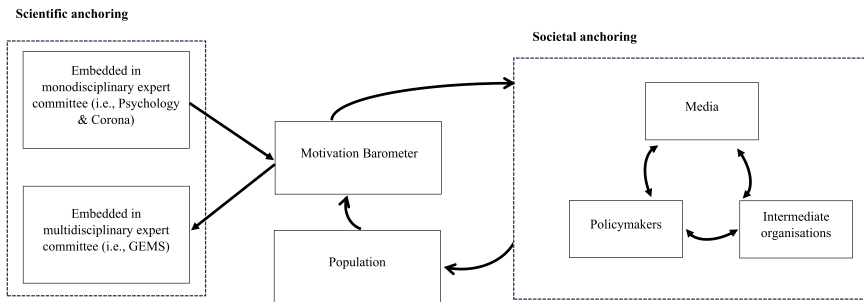


FIGURE 3 Anchoring of the Motivation Barometer within the COVID-19 policy.

TABLE 1 Overview of the key policy recommendations to handle future large-scale crises derived from the Motivation Barometer project.

Communication

1. Use an autonomy-supportive communication style by being empathic, highlighting the relevance and necessity of (stringent) measures, treating citizens as responsible and benevolent agents, and using noncontrolling language so as to preserve the population's volitional commitment to policy-based measures.
2. Build trust by communicating in a transparent way about the risks, both for individuals themselves and the broader population, while also providing an action plan so as to avoid eliciting anxiety-driven concerns.
3. Develop tools (e.g., COVID-19 barometer) to streamline communication at a population level and offer a greater sense of clarity, predictability, and control.
4. Given the heterogeneity in individuals' reasons for not adopting policy-recommended behaviors (e.g., vaccination), it is critical to tailor one's general message to the obstacles faced by specific groups in society (age, gender, level of education, cultural background).

Organization

5. Install a multidisciplinary scientific task force, comprising psychologists and behavioral scientists that provides an expert opinion on various psychological aspects of societal challenges (e.g., climate change) so as to increase the populations' trust in authorities and to foster a greater understanding and acceptance of measures.
6. Invest in the systematic monitoring of various psychological aspects of the population toward societal challenges (e.g., climate change) so as to detect variation in the motivation and level of support for critical societal measures.
7. Invest in the development of effective mental health interventions (including e-health) that can be easily upscaled and distributed, both during distressing and nondistressing times.
8. Invest in the training of key figures at the local, regional, and national levels (e.g., intermediate organizations; spokesmen of political authorities) to adopt an autonomy-supportive style when communicating measures.

and Corona," an informal, monodisciplinary expert group of psychologists, and the GEMS, a formal multidisciplinary expert group appointed by Belgian political authorities that primarily consisted of experts in medical sciences. Further, the Motivation Barometer aimed to bridge the gap between the population and various key players in society (i.e., media, intermediate organizations, policymakers). Table 1 provides a summary of various recommendations that policymakers may take into account when a similar large-scale crisis occurs that are directly informed by the results obtained within the Motivation Barometer project (see also Martela et al., 2021).

Population and intermediate organizations

An important goal was to allow citizens to voice their opinion regarding diverse policy-relevant aspects. Because social gatherings were not possible, the online format of the Motivation

Barometer offered the population a channel to share their opinion and report on their state of mind. The brief reporting of the findings in the media helped the population to contextualize their concerns, motivations, and behavior. Also, through opinion pieces and media interventions, we informed the population that the pursuit of need-satisfying activities is a proactive pathway to preserve one's well-being and to experience a sense of meaning in distressing times (Laporte et al., 2021, 2022). Other opinion pieces addressed the role of motivation and how policymakers could develop a narrative and communication style that supports the long-term commitment of the population (Pope et al., 2018).

We also reached out to the population through a variety of intermediate-level organizations that incorporated data- and theory-based insights from the Motivation Barometer. For instance, the National Crisis Center, which was responsible for the (daily) communication of the COVID-19 numbers, was eager to implement guidelines for motivating communication (Martela et al., 2021) and to disseminate these communication principles to local authorities. Similarly, we informed spokespersons of important politicians through webinars on how to communicate in motivating and respectful ways. Various healthcare organizations organized online lectures and workshops for physicians, pharmacists, and healthcare workers to set up a constructive dialogue about people's vaccination intentions or the lack thereof, grounded in empirical work (Morbée, Vansteenkiste, et al., 2022). The collected findings also helped to set priorities by indicating the subgroups that were suffering most (e.g., young adults and in particular students in early 2021) and prompted actions of institutions for higher education to support the well-being of students (see also Dekeyser et al., 2023; Schmits et al., 2021).

Policymakers

We managed to include key findings and conclusions from the Motivation Barometer within the expert advice provided by the multidisciplinary advisory committee (i.e., GEMS) and integrated into the final advice offered to political bodies responsible for decision-making by the coordinating COVID-19 office (commissariat). As such, the Motivation Barometer helped politicians navigate the crisis using evidence-informed/based recommendations rather than anecdotic and intuition-driven arguments. The advice given to policymakers both dealt with the way of framing and explaining decisions (Pope et al., 2018) as well as with the type of decisions being made, as both can impact people's health concerns/risks and need satisfactions positioned in the middle of Figure 2 (Waterschoot, Morbée, Van den Bergh, Yzerbyt, et al., 2023). Illustrative examples are: allowing two close contacts for singles during Christmas gatherings in 2020 (Waterschoot, Morbée, Van den Bergh & Vansteenkiste, 2023) and rescheduling leisure time activities of youth such that both primary and secondary school students can participate in one single leisure time activity during an extended school lockdown instead of primary school students participate in an unlimited number and secondary school students being prohibited to engage in any leisure time activity. We also discouraged other decisions, such as the use of vouchers in the hope to influence unvaccinated persons to take a vaccine as it was likely to backfire over time when a booster dose would be needed (Morbée, Vansteenkiste, et al., 2022; Waterschoot, Van Oost, Vansteenkiste et al., 2023).

At other times, our data helped policymakers to understand unanticipated responses by the Belgian public. To illustrate, the re-opening of hairdressing salons after 3 months of closure during the second lockdown was intended to increase well-being and support the motivation to keep adhering to the restrictions. In fact, this decision led to a reduction in risk perception making other restrictive measures come across as inappropriate and even illegitimate, eventually causing a general motivational decline. Such motivational decline then reduced adherence to sanitary measures (Waterschoot, Morbée, Yzerbyt et al., 2022), thereby increasing the risk for infections and hospitalizations through enhanced virus circulation. In the following, we discuss in greater detail three illustrative examples of recommendations that were implemented with variable success.

COVID-19 Barometer

The most important policy recommendation involved the implementation of a COVID-19 Barometer, a color-coded schema specifying risk levels and associated proportionate, sanitary measures (e.g., wearing mouth masks in public transport; see New Zealand for an example). In our view, the COVID-19 Barometer would serve as a logic and narrative in anticipating, taking, and communicating decisions and would therefore yield multiple psychological advantages. Specifically, it would help instill a greater sense of clarity, predictability, and controllability in the population, which was much needed as participants reported throughout the entire pandemic feeling very uncertain about how the overall situation would evolve. These situational concerns were even more salient than health-related concerns. Because the COVID-19 Barometer would allow people to better anticipate upcoming policy decisions, they could take greater responsibility for their behavior and, hence, experience a greater sense of choice and ownership in their actions. Such increased autonomous motivation was also expected because the COVID-19 Barometer would allow for a better alignment between the stringency of measures and the perceived risk, leading people to perceive measures as more proportionate and, hence, legitimate (eliciting autonomous motivation) instead of disproportionate and, hence, unnecessarily constraining (eliciting external regulation; Waterschoot, Morbée, Van den Bergh, Yzerbyt, et al., 2023).

We also considered that a COVID-19 Barometer would help policymakers to make decisions more internally coherent and would streamline (visual) communication, thereby potentially also yielding clear benefits in terms of social mobilization. That is, shared (intermediate) goals (e.g., 100 hospitalizations a day) could be announced to mobilize a collective effort in coping with the situation, thereby contributing to a sense of collective efficacy upon attainment of the goal (Elcheroth & Drury, 2020; Taberner et al., 2020).

Although we recommended the introduction of the COVID-19 Barometer early on in the crisis (i.e., June 2020), and in spite of the fact that this advice was repeatedly integrated into the reports of the multidisciplinary advice committee, the complexities of political decision-making in Belgium resulted in a slow acceptance of this idea. Admittedly, one reason why political authorities were hesitant to implement a COVID-19 Barometer is that they feared losing power to make decisions. Although the COVID-19 Barometer was never meant to be a rigid and automatized decision system, this perception dominated the discussion in the media for a prolonged period of time. Also, there was considerable political discussion on the precise indicators and thresholds to shift toward more stringent measures or introduce relaxations. In the end, the COVID-19 Barometer got introduced in February 2022, at a time when Omicron was dominant and the situation was already improving.

Risk communication

In the absence of a COVID-19 Barometer as a means to develop a coherent narrative, we recommended that policymakers engage in risk communication through the use of an if-then logic and counterfactual thinking (Petersen et al., 2022). Specifically, based on projections of biostatisticians, the population could be informed on how COVID-19 numbers (i.e., infections, hospitalizations) would evolve when stringent measures would be introduced too late or when relaxations would be introduced too early. Similarly, by telling the population about different patterns of virus circulation as a function of varying levels of adherence to measures, people could better appreciate whether their efforts really paid off. That is, a decline in people's positive outcome expectations (Beeckman et al., 2020; Schwarzer & Luszczynska, 2008) could be avoided or buffered by informing them how reduced adherence may worsen the situation. This was especially critical during the decreasing and stabilizing phases in virus circulation and hospitalizations as people tended to question the effectiveness of measures and the impact of their efforts. Such scientifically grounded *if-then communication* was also meant to serve

as an antidote to emerging conspiracy thinking (Bruder & Kunert, 2022) and to foster hope and a realistic estimation of (remaining) risks (Petersen et al., 2022), which fosters a greater acceptance and volitional endorsement of measures.

Further, we suggested that such risk-based communication was best accompanied by the simultaneous promotion of a sense of connection (Pavey et al., 2011) and an empathic stance toward vulnerable individuals (Pfattheicher et al., 2020, 2022). To the extent that citizens' compassion and concern for vulnerable populations is activated, they are more likely to adhere to the recommended health measures. Presumably, the personal meaning and significance of their efforts get more readily internalized or endorsed, which helps to explain why empathy predicts greater behavioral adherence (Pavey et al., 2012). We suggested that empathy-oriented messages should be personalized such that individuals have a specific person (e.g., a friend or family member) in mind when adhering to sanitary measures or deciding to get vaccinated (Vansteenkiste et al., 2018).

Based on our recommendation, the national crisis center adopted such if-then communication on several occasions. This was the case, for instance, in the weeks prior to Christmas and New Year celebrations in 2020, a moment during which people were hoping or pleading for more relaxed measures. On another occasion, in February 2021, a biostatistician presented different potential scenarios of virus circulation as a function of varying adherence and different relaxation plans during a press conference with the prime minister, thereby emphasizing the added value of measures for vulnerable individuals. For such communication to be effective and not merely elicit anxiety-based worrying, we had emphasized that the population should not be solely informed on a potential (exponential) increase in COVID-19 cases but also on how effective measures and sustained adherence to them are essential to keep the situation and, hence, fear under control. This advice was based on the empirical observation that not anxiety-based worrying but risk perception plays a key role in sustaining individuals' motivation and behavioral adherence (Schmitz et al., 2022).

These insights into motivating risk communication also led us to encourage policymakers to highlight the safety-enhancing role of the COVID-19 certificate in their communication. Alas, in many cases, the COVID-19 certificate was used as a motivational strategy to seduce or even bluntly force individuals into vaccination as people were promised and granted freedom when they accepted vaccination. Although vaccination was portrayed as the royal route to the "realm of freedom," we feared that the focus on freedom would elicit perceptions of unfairness and discrimination, while causing reactance among resisting nonvaccinated individuals (see Kamin-Friedman & Peled Raz, 2021). Consistent with this concern, unvaccinated persons reported higher frustration of their basic needs for autonomy and relatedness compared to vaccinated persons, with the gap between both groups widening at a moment when a large-scale use of the COVID-19 certificate was introduced in Belgium and disappearing again when the certificate was abandoned (Waterschoot, Yzerbyt, et al., 2023). Notably, the focus on freedom created false expectations and associated disappointment at a moment when vaccinated citizens received an invitation for a booster dose. By highlighting the issue of freedom, people's motivation became more conditional and externally oriented, with a backfiring effect when asking for an additional commitment (i.e., a booster dose; Waterschoot, Van Oost, Vansteenkiste, et al., 2023).

Vaccination

In an attempt to balance the physical and mental health of the population, we deemed it critical to think "out of the box" about the vaccination order. It was clear that vulnerable people, personnel in the health care sector, and older adults deserved priority in light of their medical condition or work requirements, but we considered that decreasing age was not necessarily the best criterion to determine vaccination order for the remainder of the population. When age groups faced fairly similar risks for severe illness, such as individuals below 40 years old, citizens below that age could be invited randomly instead of in age-related order. As especially young adults and teenagers reported more elevated ill-being (de

Abreu et al., 2021; Schmits et al., 2021), the mental cost of the additional waiting time before getting vaccinated could potentially be reduced. This mental toll was especially expected to increase with the start of vacation, as vacations are typically periods during which higher well-being is experienced due to enhanced autonomy, relatedness, and meaning (Campbell et al., 2018; de Bloom et al., 2009; Verma et al., 2017).

Also, invited individuals could be asked to postpone their vaccination on a voluntary basis at a later moment in time, thereby allowing other citizens who were in greater need of vaccination to come first. This recommendation was intended to capitalize on people's pro-social tendencies for empathy, mutual caring, and solidarity (Pfattheicher et al., 2020). The idea itself was deemed to have strong psychological significance to the younger populations, who had been primarily adhering to sanitary measures for the sake of the health of older generations. In return for this altruistic stance, individuals postponing their shot would display a strong empathizing signal to the younger generations. The whole idea was also meant to better balance medical and psychological arguments in deciding on the vaccination order as the linear age-based order rested solely on medical arguments. Although we launched this line of argument through an opinion piece in the media and put it on the table of various scientific committees, no real discussion was initiated, neither in the media nor among the experts, and the recommendation was not implemented.

PART 4: EXPLOITING THE SOCIETAL POTENTIAL OF THE MOTIVATION BAROMETER: LESSONS AND PITFALLS

Our experience convinced us that the Motivation Barometer project may be a source of inspiration to address other large societal challenges. As we are facing worldwide climate change (Klenert et al., 2020), we discuss a number of motivation-behavioral parallels but also notable differences with the SARS-CoV-2 pandemic. We then move on to draw several lessons from the Motivation Barometer that may prove relevant for the climate crisis and other socially relevant challenges. At the same time, we highlight the obstacles and difficulties we encountered during our journey when trying to get recommendations translated and implemented at a societal level.

Climate change

In terms of parallels, a clear similarity is that countering climate change involves a motivational and well-being component. Because the climate crisis is bound to affect people's daily routines and limit their behavioral freedom, policymakers are required to make decisions with a large-scale impact that need the autonomously motivated support of the population if one wants citizens to adhere to the measures in a durable way (Lavergne et al., 2010). Further, because climate change is associated with a higher probability of various natural disasters affecting the lives of millions of people, it may induce a sense of unpredictability and uncontrollability, thereby inducing climate anxiety (Clayton, 2020), increasing chronic stress and worries (e.g., financial concerns), and undermining citizens' well-being. A combined static (e.g., yearly basis) and dynamic (i.e., flexibly launching new waves as a function of climate-related events) monitoring approach may help policymakers in taking more timely decisions. This should then foster greater psychological resilience in the community to handle the psychological challenges that the climate crisis may cause. Finally, as climate change may affect different groups in society differently, the current methodology allows for the identification of vulnerable groups (e.g., low socioeconomic status groups, farmers, etc.) that need special care, attention, and motivational support.

Apart from these parallels between the SARS-CoV-2 pandemic and climate change, there are also clear differences in motivational-behavioral repercussions. For instance, the urgency to intervene was very clear in the case of the pandemic as the situation worsened quickly and had a rather intrusive

impact on people's lives. In such vital moments, political authorities had the legitimacy to take drastic decisions, which were largely endorsed by citizens. Although action is urgently needed to reverse global warming from a factual and *objective* perspective, political authorities and citizens may *subjectively* perceive the situation differently, thereby underestimating the short- and long-term risks associated with climate change. A “psychological wake-up call” would—similar to the SARS-CoV-2 pandemic—emerge only when citizens are sufficiently personally affected by global warming (e.g., during the European energy crisis). Also, while adhering to sanitary behaviors yielded an immediate positive impact on oneself and others, citizens may be more prone to amotivation and climate fatigue (Pelletier et al., 1999) when climate change is involved, questioning the benefits of their personal efforts (e.g., reducing the heating) and instead asking for more structural and collective action. As some of these decisions need to be taken at a global instead of national and regional level, climate change may elicit even greater perceptions of concern and worry.

This analysis suggests that the systematic monitoring of individuals' climate-related behavior (e.g., buying energy-friendly products), feelings (e.g., climate anxiety), and cognitions (e.g., estimated risks) deserves scientific attention and political priority. A climate monitor would serve as leverage to develop a more resolute and coherent policy, with political authorities having the audacity to take hard but very much-needed decisions. To achieve this important goal, we elaborate on the factors that contributed to the success of the Motivation Barometer project, while also discussing some of the struggles we faced.

Structural anchoring of psychological expertise

Rather than just collecting data on behavioral adherence and well-being, it is also important to assess variables that come earlier in the sequence and that predict these outcomes. These precursors of behavior and well-being are preferentially modifiable by changing the social environment. To illustrate, the motivational variables at the center of the theoretical model in Figure 2 can be dynamically influenced by varying the social context (e.g., risk perception, motivating communication, debunking fake news, changing levels of trust, social identities, etc.). Through the systematic study of such predictors, a preventive policy can be developed, with action plans influencing the desired “distal” outcomes through the sequence of proposed intervening variables.

To move beyond a symptomatic approach, it might be good to involve experts in psychology in large-scale theory-based monitoring studies. Such psychological expertise is often lacking in communication consulting firms, who in many cases present rather descriptive and symptom-specific findings (e.g., “Are older individuals more likely to accept the vaccine?”; “Do female participants report more anxiety?”). Although informative, such descriptive findings do not suffice because they do not provide an in-depth understanding of why certain phenomena occur (e.g., “Why is it that older individuals are more likely to accept the vaccine?”). To move beyond speculative and intuition-driven explanations for observed differences in outcomes, coherent theoretical models are needed to shed light on the structural relations between variables.

The challenges of the pandemic created a unique ad hoc collaborative team of senior and junior researchers from different universities of all parts of Belgium, in a later stage glued together by ad hoc funding of the Ministry of Public Health. The initiative laid the ground for the ambition of continued collaboration on other societally relevant issues. In the ideal case, the acquired knowledge and expertise get anchored within existing scientific institutions that have sufficient behavioral and psychological expertise on board. Such institutions will of course reduce the pace of waves such that the psychological pressure in society becomes assessed via a predetermined schedule (i.e., a more static barometer). Yet, when required by the situation, a more flexible and dynamic approach could again be activated to provide more on-the-spot evidence-based advice to policymakers.

The structural anchoring of psychological expertise within scientific institutions may also contribute to a quicker implementation of recommendations. Policymakers were rather hesitant to launch

preventive, large-scale psychological initiatives (e.g., building a platform with testimonials of social models on how to preserve one's mental health during lockdown periods; providing financial support to organizations and schools that invest in mental health initiatives). Various factors may explain this hesitancy, including the complex federalized political system (i.e., there are nine ministers of health across different governmental levels in Belgium), the underrepresentation of psychological and behavioral experts in key advisory committees, and the lack of convincing data in the eyes of policymakers. Although the number of hospitalizations is a visible and impactful medical indicator, a psychological equivalent was missing. Although an increase in the number of individuals seeking psychological treatment and the number of patients on the waiting list for treatment signaled that the population's mental health was under threat (see reports of Superior Health Council, 2021), these really represented distal outcomes. In the ideal case, one should develop a preventive policy to avoid these negative outcomes, with people's basic need satisfaction and concerns thus serving as an early *warning signal* to take political action (see also Martela & Ryan, 2021). Rather paradoxically, policymakers were often tempted to wait until the situation was worsening at the psychological level before taking any action at all (e.g., hiring of additional psychologists at higher education institutions to provide counseling to students).

Organization

In terms of organization, aggregating various subfields of academic and professional psychology (i.e., Psychology and Corona expert group) to discuss new findings and (political and societal) implications from the Motivation Barometer allowed us to develop a streamlined and shared viewpoint regarding different psychological matters. This contributed to building a coherent and consistent message that could be launched by the psychological discipline to all stakeholders. Because individual experts served as representative spokespersons of a commonly held viewpoint, the net result was increased credibility of psychological sciences.

Although online platforms allowed us to meet in an efficient way on a weekly basis, it was a challenge to maintain the frequency of meetings over time. Moreover, depending on changing circumstances, scholars (e.g., organizational psychologists) were invited on a more ad hoc basis. Although neither the Psychology and Corona expert group as an entity was formally founded nor their members officially elected, the deans of psychology departments of all Belgian universities were informed of the initiative. Although the informal status of this group together with its organic growth constituted clear strengths of this initiative, it seems critical to establish more formal multi- and monodisciplinary expert groups that deal with other topics (e.g., climate change). In this way, the communication with interested academic scholars and key stakeholders in society could be optimized and streamlined.

Brief reports and working mode

Another factor pertains to the widespread availability of short, clear, and punctual reports of the survey data (see Appendix 1 for an overview). These reports¹ relied on nontechnical jargon and included a series of recommendations for practice. In addition, automatized routines allowed to release them soon after data collection, capitalizing on the "societal urgency" of our findings. Hence, the dynamic nature of the Motivation Barometer in conjunction with the quick turnover in the reporting of findings was a key factor explaining its success. As findings had high societal relevance, the Motivation Barometer served as leverage to influence political decisions. A similar dynamic approach seems very much needed for climate-related topics (e.g., the psychological impact of flooding and heat waves)

¹ Available here: <https://motivationbarometer.com/en/rapporten-2/>

as the momentum for making critical decisions that are sufficiently supported by the population may otherwise quickly fade away.

We were required to adapt our traditional mode of working rather drastically. Although the normal way of doing science tends to be fairly slow, sophisticated, and technical, we needed to act swiftly, were required to rely on fairly “simple” statistics to convey key findings, and needed to communicate in an engaging manner. At the same time, we needed to keep a high level of scientific rigor and nuance in conveying findings (e.g., being clear about the correlational nature of findings). Also, we want to note that these reports served as the basis for more fully developed scientific contributions that were refined through the scientific publication process.

Apart from being quickly and rigorously produced, these reports also needed to touch upon psychological topics that were salient at a given moment in time. To make sure that chosen themes and guiding research questions were pertinent, we were in constant contact with the multidisciplinary advisory team (i.e., GEMS), the coordinating COVID-19 office (commissariat), and the spokesperson of key ministers. At the same time, we were determined to keep our scientific independence intact. Based on our findings, we were sometimes supportive and at other times critical of the decisions or the communication style adopted by politicians. Although ad hoc funding came via the Federal Ministry of Health and the National Social Security services, no constraints were imposed on us, and we were able to remain fully independent as academics.

Connection with media

Along the road, we built collaborative relations with critical media (e.g., the main public television channels, major newspapers, etc.). This involved temporary embargos to make sure that reports would be picked up and covered in parallel in both language groups of the country. Extensive coverage by the media was an additional argument for politicians to take the findings and recommendations into account when weighing the pros and cons of decisions for individuals’ motivation, mental health, and political trust. These collaborative relationships with the media also provided the ground for senior researchers of the Motivation Barometer to weigh on the public debate through opinion pieces in newspapers and magazines and through participation in several debates on TV or appearances on the TV news. All of this helped establish the reputation of the research team and the added value of psychological sciences in such difficult times.

Although the presence in the media and the funding by the ministry contributed positively to the pursuit of the project, it also had pitfalls. For instance, because newspapers were involved in the recruitment of participants, they were eager to be the first to publish new findings. We handled this media pressure by keeping strict control over the moment and way of launching new reports.

Also, our great visibility meant that for segments of the population who were distrusting authorities, the COVID-19 barometer was increasingly approached with suspicion. For example, some conspiracy-oriented groups portrayed the team as seeking to “manipulate” the population into vaccination and adherence to sanitary measures. In the later stages of the pandemic, these groups of anti-vaxxers invited their supporters to respond to the surveys to impact the findings. Other critical voices suggested that psychologists had been instrumentalized by medical-oriented disciplines to motivate citizens *into* compliance. We dealt with these challenges by transparently presenting responses of vaccinated and nonvaccinated individuals separately and being clear about the psychological pitfall of the introduction and communication on the COVID-19 certificate (Waterschoot, Yzerbyt, et al., 2023). Also, we favored a differentiated approach whereby both the supporters and the opponents of vaccination were treated as much as possible as groups comprising a diverse set of profiles. Although this posture was sometimes difficult to maintain in our communication with the media, it minimized the possibility of a phenomenon of group homogeneity whereby our own findings would contribute to the polarization of society. In fact, to support the full endorsement of sanitary measures and vaccination, individuals’ sense of choice and autonomy needs to be maximally preserved and supported to foster long-term commitment (Morbée, Vansteenkiste, et al., 2022; Waterschoot, Van Oost, Vansteenkiste, et al., 2023). The

autonomy-supportive approach which we argued for is completely at odds with the idea of seducing, forcing, let alone, manipulating the population into certain behaviors (Vansteenkiste & Sheldon, 2006).

CONCLUSION

The pandemic offered a unique opportunity for social and behavioral scientists to bring their expertise and knowledge to the forefront and to play a complementary role in providing evidence-based recommendations to policymakers next to medical-oriented experts. In the Belgian context, the Motivation Barometer was a critical tool to help psychological scholars in achieving their mission to “give back to society”. The journey of developing the Motivation Barometer and persisting in its actual use was exciting and hopefully inspiring for addressing other societal challenges nowadays and in the future.

ACKNOWLEDGMENT

The work was supported by the Belgian Ministry of Public Health and the Special Research Fund of Ghent University [BOFCOV2020000701].

REFERENCES

- *These contributions emerged from the Motivation Barometer project.
- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, *117*(3), 497–529. <https://doi.org/10.1037/0033-2909.117.3.497>
- Beeckman, M., De Paepe, A., Van Alboom, M., Maes, S., Wauters, A., Baert, F., Kissi, A., Veirman, E., Van Ryckeghem, D. M. L., & Poppe, L. (2020). Adherence to the physical distancing measures during the covid-19 pandemic: A hapa-based perspective. *Applied Psychology: Health and Well-Being*, *12*(4), 1224–1243.
- Bou-Hamad, I., Hoteit, R., & Harajli, D. (2021). Health worries, life satisfaction, and social well-being concerns during the COVID-19 pandemic: Insights from Lebanon. *PLoS One*, *16*(7), e0254989.
- Bradshaw, E. L., Ryan, R. M., Noetel, M., Saeri, A. K., Slattery, P., Grundy, E., & Calvo, R. (2021). Information safety assurances increase intentions to use COVID-19 contact tracing applications, regardless of autonomy-supportive or controlling message framing. *Frontiers in Psychology*, *11*, 591638.
- *Brenning, K., Waterschoot, J., Dieleman, L., Morbée, S., Vermote, B., Soenens, B., van der Kaap-Deeder, J., van den Bogaard, D., & Vansteenkiste, M. (2022). The role of emotion regulation in mental health during the COVID-19 outbreak: A 10-wave longitudinal study. *Stress and Health*, *39*(3), 562–575.
- Brewer, N. T., Chapman, G. B., Gibbons, F. X., Gerrard, M., McCaul, K. D., & Weinstein, N. D. (2007). Meta-analysis of the relationship between risk perception and health behavior: The example of vaccination. *Health Psychology*, *26*(2), 136–145.
- *Brisbois, M., Schmitz, M., Raemdonck, E., Yzerbyt, V., Klein, O., Luminet, O., Morbée, S., Van den Bergh, O., Van Oost, P., Waterschoot, J., & Vansteenkiste, M. (2023). Support and anticipated psychological outcomes of different vaccination policy options during the pandemic: A Belgian study. *Manuscript in progress*.
- Bruder, M., & Kunert, L. (2022). The conspiracy hoax? Testing key hypotheses about the correlates of generic beliefs in conspiracy theories during the COVID-19 pandemic. *International Journal of Psychology*, *57*(1), 43–48.
- Campbell, R., Soenens, B., Beyers, W., & Vansteenkiste, M. (2018). University students' sleep during an exam period: The role of basic psychological needs and stress. *Motivation and Emotion*, *42*, 671–681.
- Cantarero, K., van Tilburg, W. A. P., & Smoktunowicz, E. (2021). Affirming basic psychological needs promotes mental well-being during the COVID-19 outbreak. *Social Psychological and Personality Science*, *12*(5), 821–828.
- Champion, V. L., & Skinner, C. S. (2008). The health belief model. *Health Behavior and Health Education: Theory, Research, and Practice*, *4*, 45–65.
- Charilaou, L., & Vijaykumar, S. (2023). Influences of news and social media on food insecurity and hoarding behavior during the COVID-19 pandemic. *Disaster Medicine and Public Health Preparedness*, *17*, e58.
- Chiu, T. K. F. (2022). Applying the self-determination theory to explain student engagement in online learning during the COVID-19 pandemic. *Journal of Research on Technology in Education*, *54*, S14–S30.
- Clayton, S. (2020). Climate anxiety: Psychological responses to climate change. *Journal of Anxiety Disorders*, *74*, 102263.
- Cheek, N. N., Reutskaja, E., & Schwartz, B. (2022). Balancing the freedom-security trade off during crisis and disasters. *Perspectives on Psychological Science*, *17*(4), 1024–1049.
- Chen, B., Soenens, B., Vansteenkiste, M., Van Petegem, S., & Beyers, W. (2016). Where do the cultural differences in dynamics of controlling parenting lie? Adolescents as active agents in the perception of and coping with parental behavior. *Psychologica Belgica*, *56*(3), 169.
- de Abreu, P. M. J. E., Neumann, S., Wealer, C., Abreu, N., Macedo, E. C., & Kirsch, C. (2021). Subjective well-being of adolescents in Luxembourg, Germany and Brazil during the COVID-19 pandemic. *Journal of Adolescent Health*, *69*(2), 211–218.

- De Bloom, J., Kompier, M., Geurts, S., De Weerth, C., Taris, T., & Sonnentag, S. (2009). Do we recover from vacation? Meta-analysis of vacation effects on health and well-being. *Journal of Occupational Health, 51*(1), 13–25.
- de Figueiredo, A., & Larson, H. J. (2021). Exploratory study of the global intent to accept COVID-19 vaccinations. *Communications Medicine, 1*(1), 1–10.
- Dekeyser, S., Schmits, E., Glowacz, F., Klein, O., Schmitz, M., Wollast, R., Yzerbyt, V., & Luminet, O. (2023). Predicting compliance with sanitary behaviors among students in higher education during the second COVID-19 wave: The role of health anxiety and risk perception. *Psychologica Belgica, 63*(1), 1–15.
- *Desimpelaere, E., Soenens, B., Prinzie, P., Waterschoot, J., Vansteenkiste, M., Morbée, S., Schrooyen, C., & De Pauw, S. (2023). Parenting stress, Parental burnout, and parenting behaviors during the COVID-19 pandemic: Comparing parents of children with and without complex care needs. *Journal of Child and Family Studies, Early access*.
- Douglas, K. M. (2021). COVID-19 conspiracy theories. *Group Processes & Intergroup Relations, 24*(2), 270–275.
- *Duprez, V., Vermote, B., Van Hecke, A., Verhaeghe, R., Vansteenkiste, M., & Malfait, S. (2021). Are internship experiences during a pandemic related to students' commitment to nursing education? A cross-sectional study. *Nurse Education Today, 107*, 105124.
- Elcherroth, G., & Drury, J. (2020). Collective resilience in times of crisis: Lessons from the literature for socially effective responses to the pandemic. *British Journal of Social Psychology, 59*(3), 703–713.
- Fiorillo, A., & Gorwood, P. (2020). The consequences of the COVID-19 pandemic on mental health and implications for clinical practice. *European Psychiatry, 63*(1), e32.
- Fiske, S. T. (2018). *Social beings: Core motives in social psychology*. John Wiley & Sons.
- Furukawa, E., Tangney, J., & Higashibara, F. (2012). Cross-cultural continuities and discontinuities in shame, guilt, and pride: A study of children residing in Japan, Korea, and the USA. *Self and Identity, 11*, 90–113.
- Gelfand, M. J., Jackson, J. C., Pan, X., Nau, D., Pieper, D., Denison, E., Dagher, M., Van Lange, P. A. M., Chiu, C.-Y., & Wang, M. (2021). The relationship between cultural tightness-looseness and Covid-19 cases and deaths: A global analysis. *Lancet Planet Health, 5*(3), e135–e144.
- Guay, F., Bureau, J. S., Boulet, J., & Bradet, R. (2021). COVID-19 illegal social gatherings: Predicting rule compliance from autonomous and controlled forms of motivation. *Motivation Science, 7*(3), 356–362.
- Gross, J. J. (2015). Emotion regulation: Current status and future prospects. *Psychological Inquiry, 26*(1), 1–26.
- Haddad, C., Sacre, H., Zeenny, R. M., Hajj, A., Akel, M., Iskandar, K., & Salameh, P. (2022). Should samples be weighted to decrease selection bias in online surveys during the COVID-19 pandemic? Data from seven datasets. *BMC Medical Research Methodology, 22*(1), 1–11.
- Hansen, T., Nilsen, T. S., Yu, B., Knapstad, M., Skogen, J. C., Vedaa, Ø., & Nes, R. B. (2021). Locked and lonely? A longitudinal assessment of loneliness before and during the COVID-19 pandemic in Norway. *Scandinavian Journal of Public Health, 49*(7), 766–773.
- Hornsey, M. J. (2020). Conspiracy theories. *Together apart: The psychology of COVID-19*, (pp. 41–46). SAGE Publishing.
- Hornsey, M. J., Lobera, J., & Díaz-Catalán, C. (2020). Vaccine hesitancy is strongly associated with distrust of conventional medicine, and only weakly associated with trust in alternative medicine. *Social Science & Medicine, 255*, 113019.
- Howard, J. L., Bureau, J. S., Guay, F., Chong, J. X., & Ryan, R. M. (2021). Student motivation and associated outcomes: A meta-analysis from self-determination theory. *Perspectives on Psychological Science, 16*(6), 1300–1323.
- Kamin-Friedman, S., & Peled Raz, M. (2021). Lessons from Israel's COVID-19 Green Pass program. *Israel Journal of Health Policy Research, 10*(1), 1–6.
- Kazak, A. E. (2020). Psychology is an essential science: American psychologist highlights the role of psychology in understanding and addressing COVID-19. *American Psychologist, 75*(5), 605–606.
- Klein, O., & Yzerbyt, V. (2023). *The psychology of vaccination*. Routledge.
- Klenert, D., Funke, F., Mattauch, L., & O'Callaghan, B. (2020). Five lessons from COVID-19 for advancing climate change mitigation. *Environmental and Resource Economics, 76*(4), 751–778.
- Laporte, N., Soenens, B., Brenning, K., & Vansteenkiste, M. (2021). Adolescents as active managers of their own psychological needs: The role of psychological need crafting in adolescents' mental health. *Journal of Adolescence, 88*, 67–83.
- *Laporte, N., Van den Bogaard, D., Brenning, K., Soenens, B., & Vansteenkiste, M. (2022). Testing an online program to foster need crafting during the COVID-19 pandemic. *Current Psychology, Early access*.
- Larson, H. J., Clarke, R. M., Jarrett, C., Eckersberger, E., Levine, Z., Schulz, W. S., & Paterson, P. (2018). Measuring trust in vaccination: A systematic review. *Human Vaccines & Immunotherapeutics, 14*(7), 1599–1609.
- Laverge, K. J., Sharp, E. C., Pelletier, L. G., & Holtby, A. (2010). The role of perceived government style in the facilitation of self-determined and non-self-determined motivation for pro-environmental behavior. *Journal of Environmental Psychology, 30*, 169–177.
- Legate, N., & Weinstein, N. (2022). Can we communicate autonomy support and a mandate? How motivating messages relate to motivation for staying at home across time during the COVID-19 pandemic. *Health Communication, 37*(14), 1842–1849.
- *Legate, N., Ngyuen, T. V., Weinstein, N., Moller, A., Legault, L., Vally, Z., Tajchman, Z., Zsido, A. N., Zrimsek, M., Chen, Z., Ziano, I., Gialitaki, Z., Ceary, C. D., Jang, Y., Lin, Y., Kunisato, Y., Yamada, Y., Xiao, Q., ... Ogbonnaya, C. E. (2022). A global experiment on motivating social distancing during the COVID-19 pandemic. *Proceedings of the National Academy of Sciences, 119*(22), e2111091119.
- Levine, L., Kay, A., & Shapiro, E. (2022). The anxiety of not knowing: Diagnosis uncertainty about COVID-19. *Current Psychology, 1–8*.

- Ma, L., & Christensen, T. (2019). Government trust, social trust, and citizens' risk concerns: Evidence from crisis management in China. *Public Performance & Management Review*, 42(2), 383–404.
- Magrin, M. E., Guarischi, M., Liga, F., Nicolotti, M., & Pielich, I. (2023). Adherence to social distancing during the Covid-19 pandemic in Italy: The role of autonomous motivation and defiance. *Journal of Health Psychology*, 28(3), 230–240.
- Martela, F., Hankonen, N., Ryan, R. M., & Vansteenkiste, M. (2021). Motivating voluntary compliance to behavioural restrictions: Self-Determination Theory-based checklist of principles for COVID-19 and other emergency communications. *European Review of Social Psychology*, 32(2), 305–347.
- Martela, F., & Ryan, R. M. (2021). In selecting measures for a comprehensive assessment of well-being, it is essential to include indicators of psychological need satisfaction. *Preventive Medicine Reports*, 23, 101474.
- Maslow, A. H. (1954). *Motivation and personality*. Harper and Row.
- Mayer, R. C., Davis, J. H., & Schoorman, F. D. (1995). An integrative model of organizational trust. *Academy of Management Review*, 20(3), 709–734.
- Meulenbroeks, R., & van Joolingen, W. R. (2022). Students' self-reported well-being under corona measures, lessons for the future. *Heliyon*, 8(1), e08733.
- Moatti, J. P. (2020). The French response to COVID-19: Intrinsic difficulties at the interface of science, public health, and policy. *The Lancet. Public Health*, 5(5), e255.
- *Morbée, S., Haerens, L., Waterschoot, J., & Vansteenkiste, M. (2021). Which cyclists manage to cope with the corona crisis in a resilient way? The role of motivational profiles. *International Journal of Sport & Exercise Psychology*, 20(4), 1049–1067.
- Morbée, S., Beeckman, M., Loeys, T., Waterschoot, J., Cardon, G., Haerens, L., & Vansteenkiste, M. (2023). An examination of the reciprocal associations between physical activity and anxiety, depressive symptoms, and sleep quality during the first 9 weeks of the COVID-19 pandemic in Belgium. *Mental Health and Physical Activity*, 24, 100500.
- *Morbée, S., Vansteenkiste, M., Waterschoot, J., Klein, O., Luminet, O., Schmitz, M., Van den Bergh, O., Van Oost, P., & Yzerbyt, V. (2022). The role of communication style and external strategies in predicting vaccination experiences and intentions: An experimental vignette study. *Health Communication*, 38(13), 2894–2903.
- *Morbée, S., Vermote, B., Waterschoot, J., Dieleman, L., Soenens, B., Van den Bergh, O., Ryan, R. M., Vanhalst, J., De Muynck, G.-J., & Vansteenkiste, M. (2021). Adherence to COVID-19 measures: The critical role of autonomous motivation on a short- and long-term basis. *Motivation Science*, 7(4), 487–496.
- *Morbée, S., Waterschoot, J., Yzerbyt, V., Klein, O., Luminet, O., Schmitz, M., Van Den Bergh, O., Van Oost, P., De Craene, S., & Vansteenkiste, M. (2022). Personal and contextual determinants of COVID-19 vaccination intention: A vignette study. *Expert Review of Vaccines*, 21(10), 1475–1485.
- Panchal, U., Salazar de Pablo, G., Franco, M., Moreno, C., Parellada, M., Arango, C., & Fusar-Poli, P. (2023). The impact of COVID-19 lockdown on child and adolescent mental health: Systematic review. *European Child & Adolescent Psychiatry*, 32(7), 1151–1177.
- Pavey, L., Grietemeyer, T., & Sparks, P. (2011). Highlighting relatedness promotes prosocial motives and behavior. *Personality and Social Psychology Bulletin*, 37(7), 905–917.
- Pavey, L., Grietemeyer, T., & Sparks, P. (2012). 'I help because I want to, not because you tell me to': Empathy increases autonomously motivated helping. *Personality and Social Psychology Bulletin*, 38(5), 681–689.
- Pelletier, L., Tuson, K., & Green-Demers, I. (1999). Why do people fail to adopt environmental protective behaviors? Toward a taxonomy of environmental amotivation. *Journal of Applied Social Psychology*, 29(12), 2481–2504.
- Petersen, M. B., Christiansen, L. E., Bor, A., Lindholt, M. F., Jorgensen, F., Adler-Nissen, R., Roepstorff, A., & Lehmann, S. (2022). Communicate hope to motivate the public during the COVID-19 pandemic. *Scientific Reports*, 12(1), 2502.
- Pfattheicher, S., Nockur, L., Böhm, R., Sassenrath, C., & Petersen, M. B. (2020). The emotional path to action: Empathy promotes physical distancing and wearing of face masks during the COVID-19 pandemic. *Psychological Science*, 31(11), 1363–1373.
- Pfattheicher, S., Petersen, M. B., & Bohm, R. (2022). Information about herd immunity through vaccination and empathy promote COVID-19 vaccination intentions. *Health Psychology*, 41(2), 85–93.
- Pope, J. P., Pelletier, L., & Guertin, C. (2018). Starting off on the best foot: A review of message framing and message tailoring, and recommendations for the comprehensive messaging strategy for sustained behavior change. *Health Communication*, 33(9), 1068–1077.
- Pummerer, L., Böhm, R., Lilleholt, L., Winter, K., Zettler, I., & Sassenberg, K. (2022). Conspiracy theories and their societal effects during the COVID-19 pandemic. *Social Psychological and Personality Science*, 13(1), 49–59.
- Ricoeur, P. (1966). *Freedom and nature: The voluntary and the involuntary*. Northwestern University Press.
- Rosenstock, I. M. (1974). Historical origins of the health belief model. *Health Education Monographs*, 2(4), 328–335.
- Roth, G., Benita, M., Amrani, C., Shachar, B. H., Asoulin, H., Moed, A., Bibi, U., & Kanat-Maymon, Y. (2014). Integration of negative emotional experience versus suppression: Addressing the question of adaptive functioning. *Emotion*, 14(5), 908–919.
- Roth, G., Vansteenkiste, M., & Ryan, R. M. (2019). Integrative emotion regulation: Process and development from a self-determination theory perspective. *Development and Psychopathology*, 31(3), 945–956.
- Rudert, S. C., Gleibs, I. H., Gollwitzer, M., Hafner, M., Hajes, K. V., Harth, N. S., Hausser, J. A., Imhoff, R., & Schneider, D. (2021). Us and the virus understanding the covid-19 pandemic through a social psychological lens. *European Psychologist*, 26(4), 259–271.

- Ryan, R. M., & Deci, E. L. (2006). Self-regulation and the problem of human autonomy: Does psychology need choice, self-determination, and will? *Journal of Personality, 74*(6), 1557–1586.
- Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. Guilford Publications.
- Ryan, R. M., Deci, E. L., Vansteenkiste, M., & Soenens, B. (2021). Building a science of motivated persons: Self-determination theory's empirical approach to human experience and the regulation of behavior. *Motivation Science, 7*(2), 97–110.
- Saban, M., Myers, V., Shetrit, S. B., & Wilf-Miron, R. (2021). Issues surrounding incentives and penalties for COVID-19 vaccination: The Israeli experience. *Preventive Medicine, 153*, 106763.
- Samsen-Bronsveld, H. E., Van der Ven, S. H. G., Speetjens, P. P. A. M., & Bakx, A. W. E. A. (2023). Impact of the COVID-19 lockdown on gifted and non-gifted primary school students' well-being and motivation from a self-determination perspective. *Journal of Research in Special Education Needs, 23*(2), 100–115.
- Schmits, E., Dekeyser, S., Klein, O., Luminet, O., Yzerbyt, V., & Glowacz, F. (2021). Psychological distress among students in higher education: One year after the beginning of the COVID-19 pandemic. *International Journal of Environmental Health Research and Public Health, 18*, 7445.
- *Schmitz, M., Luminet, O., Klein, O., Morbée, S., Van den Bergh, O., Van Oost, P., Waterschoot, J., Yzerbyt, V., & Vansteenkiste, M. (2022). Predicting vaccine uptake during COVID-19 crisis: A motivational approach. *Vaccine, 40*(2), 288–297.
- *Schrooyen, C., Soenens, B., Waterschoot, J., Vermote, B., Morbée, S., Beyers, W., Brenning, K., Dieleman, L., Van der Kaap-Deeder, J., & Vansteenkiste, M. (2021). Parental identity as a resource for parental adaptation during the COVID-19 lockdown. *Journal of Family Psychology, 35*(8), 1053–1064.
- Schwarzer, R., & Luszczynska, A. (2008). How to overcome health-compromising behaviors: The health action process approach. *European Psychologist, 13*(2), 141–151.
- Senécal, C., Nouwen, A., & White, D. (2000). Motivation and dietary self-care in adults with diabetes: Are self-efficacy and autonomous self-regulation complementary or competing constructs? *Health Psychology, 19*(5), 452–457.
- Statbel. (2020–2022). Structure of the Belgian population. <https://statbel.fgov.be/nl/themas/bevolking/structuur-van-de-bevolking#panel-14>
- Superior Health Council. (2021). Report 9610, 9662, and 9676. <https://www.health.belgium.be/en/superior-health-council>
- Tabernerero, C., Castillo-Mayén, R., Luque, B., & Cuadrado, E. (2020). Social values, self-and collective efficacy explaining behaviours in coping with Covid-19: Self-interested consumption and physical distancing in the first 10 days of confinement in Spain. *PLoS One, 15*(9), e0238682.
- Trougakos, J. P., Chawla, N., & McCarthy, J. M. (2020). Working in a pandemic: Exploring the impact of COVID-19 health anxiety on work, family, and health outcomes. *Journal of Applied Psychology, 105*(1), 1234–1245.
- Tyler, T. R. (2006). Psychological perspectives on legitimacy and legitimation. *Annual Review of Psychology, 57*, 375–400.
- Van Bavel, J. J., Baicker, K., Boggio, P. S., Capraro, V., Cichocka, A., Cikara, M., Crockett, M. J., Crum, A. J., Douglas, K. M., Druckman, J. N., Drury, J., Dube, O., Ellemers, N., Finkel, E. J., Fowler, J. H., Gelfand, M., Han, S., Haslam, S. A., Jetten, J., ... Willer, R. (2020). Using social and behavioural science to support COVID-19 pandemic response. *Nature Human Behaviour, 4*(5), 460–471.
- *Van de Castele, M., Waterschoot, J., Anthierens, S., DeSmet, A., Galand, B., Goossens, H., Morbée, S., & Vansteenkiste, M. (2022). Saliva testing among teachers during the COVID-19 pandemic: Effects on health concerns, well-being, and precautionary behavior. *Social Science & Medicine, 311*, 115295.
- *van den Bogaard, D., Brenning, K., van Hees, V., Soenens, B., & Vansteenkiste, M. (2023). Training need crafting skills among students during the COVID-19 pandemic: Testing the effectiveness of LifeCraft, an online prevention program. *Manuscript submitted*.
- *Van der Kaap-Deeder, J., Vermote, B., Waterschoot, J., Soenens, B., Morbee, S., & Vansteenkiste, M. (2021). The role of ego integrity and despair in older adults' well-being during the COVID-19 crisis: The mediating role of need-based experiences. *European Journal of Aging, 19*(1), 117–129.
- *Van Oost, P., Schmitz, M., Klein, O., Brisbois, M., Luminet, O., Morbée, S., Raemdonck, E., Van den Bergh, O., Vansteenkiste, M., Waterschoot, K., & Yzerbyt, V. (2023). When views about alternative medicine, nature, and God come in the way of people's vaccination intentions. *Manuscript in revision*.
- *Van Oost, P., Yzerbyt, V., Schmitz, M., Vansteenkiste, M., Luminet, O., Morbée, S., Van den Bergh, O., Waterschoot, J., & Klein, O. (2022). The relation between conspiracism, government trust, and COVID-19 vaccination intentions: The key role of motivation. *Social Science and Medicine, 301*, 114926.
- Van Petegem, S., Soenens, B., Vansteenkiste, M., & Beyers, W. (2015). Rebels with a cause? Adolescent defiance from the perspective of reactance theory and self-determination theory. *Child Development, 86*(3), 903–918.
- Van Petegem, S., Trinkner, R., van der Kaap-Deeder, J., Antonietti, J. P., & Vansteenkiste, M. (2021). Police procedural justice and adolescents' internalization of the law: Integrating self-determination theory into legal socialization research. *Journal of Social Issues, 77*(2), 336–366.
- Van Scoy, L. J., Snyder, B., Miller, E. L., Toyobo, O., Grewal, A., Ha, G., Gillespie, S., Patel, M., Zgierska, A. E., & Lennon, R. P. (2022). 'Us-Versus-Them': Othering in COVID-19 public health behavior compliance. *PLoS One, 17*(1), e0261726.
- Vansteenkiste, M., & Sheldon, K. M. (2006). 'There's nothing more practical than a good theory': Integrating motivational interviewing and Self-Determination Theory. *British Journal of Clinical Psychology, 45*, 63–82.

- Vansteenkiste, M., Aelterman, A., De Muynck, G-J., Haerens, L., Patall, E., & Reeve, J. (2018). Fostering personal meaning and self-relevance: A self-determination theory perspective on internalization. *Journal of Experimental Education*, 86, 30–49.
- Vansteenkiste, M., Soenens, B., Van Petegem, S., & Duriez, B. (2014). Longitudinal associations between adolescent perceived degree and style of parental prohibition and internalization and defiance. *Developmental Psychology*, 50, 229–236.
- Vansteenkiste, M., Ryan, R. M., & Soenens, B. (2020). Basic psychological need theory: Advancements, critical themes, and future directions. *Motivation and Emotion*, 44, 1–31.
- Verma, S., Allen, N. B., Trinder, J., & Bei, B. (2017). Highs and lows: Naturalistic changes in mood and everyday hassles over school and vacation periods in adolescents. *Journal of Adolescence*, 61, 17–21.
- *Vermote, B., Waterschoot, J., Morbée, S., der Kaap-Deeder, V., Schrooyen, C., Soenens, B., Ryan, R., & Vansteenkiste, M. (2022). Do psychological needs play a role in times of uncertainty? Associations with well-being during the COVID-19 crisis. *Journal of Happiness Studies*, 23(1), 257–283.
- *Vermote, B., Morbée, S., Soenens, B., Vansteenkiste, M., Waterschoot, J., Beyers, W., & Van der Kaap-Deeder, J. (2023). How do late adults experience meaning during the COVID-19 lockdown? The role of intrinsic goals. *Journal of Happiness Studies*, 24(5), 1759–1780.
- *Waterschoot, J., Morbée, S., Soenens, B., Van den Bergh, O., Raemdonck, E., Brisbois, M., Schmitz, M., Klein, O., Luminet, O., Van Oost, P., Yzerbyt, V., & Vansteenkiste, M. (2023). Psychological need fulfillment as a source of resilience: Its protective role in concerns and symptoms of anxiety and depression during the COVID-19 pandemic. *Applied Psychology: Health and Well-Being*. In press.
- *Waterschoot, J., Morbée, S., Van den Bergh, O., & Vansteenkiste, M. (2023). Merry Christmas and a 'healthy' New Year: Assessing people's expectations regarding Christmas gathering in pandemic times. *European Journal of Health Psychology*, 30(1), 17–28.
- *Waterschoot, J., Morbée, S., Van den Bergh, O., Yzerbyt, V., Raemdonck, E., Brisbois, M., Schmitz, M., Klein, O., Luminet, O., Van Oost, P., & Vansteenkiste, M. (2023). How the stringency of the COVID-19 restrictions influences motivation for adherence and well-being: The critical role of proportionality. *International Journal of Health Policy and Management*, 12, 8021.
- *Waterschoot, J., Morbée, S., Vermote, B., Brenning, K., Flamant, N., Vansteenkiste, M., & Soenens, B. (2022). Emotion regulation in times of COVID-19: A person-centered approach based on Self-Determination Theory. *Current Psychology*, 42, 20211–20225.
- *Waterschoot, J., Morbée, S., Yzerbyt, V., Van Oost, P., Klein, O., Luminet, O., Schmitz, M., Van den Bergh, O., & Vansteenkiste, M. (2023). 'Dances with viruses': The association between motivation and epidemiology of COVID-19. *Manuscript submitted*.
- *Waterschoot, J., Van Oost, P., Schmitz, M., Luminet, O., Klein, O., Morbée, S., Soenens, B., Van den Berg, O., Yzerbyt, V., & Vansteenkiste, M. (2023). How do vaccination intentions change over time? The role of motivational growth. *Health Psychology*, 42(2), 113–123.
- *Waterschoot, J., Van Oost, P., Vansteenkiste, M., Schmitz, M., Morbée, S., Klein, O., Luminet, O., Van den Bergh, O., & Yzerbyt, V. (2023). Who is motivated to accept a booster an annual dose? A dimensional and person-centered approach. *Applied Psychology: Health and Well-being*, 15, 1293–1318.
- *Waterschoot, J., Vansteenkiste, M., Brisbois, M., Klein, O., Luminet, O., Morbée, S., Raemdonck, E., Schmitz, M., Van Oost, P., Yzerbyt, V., & Van den Bergh, O. (2023). The role of risk perception in the prediction of autonomous motivation, behavioral adherence and vaccination intentions during the COVID-19 Pandemic. *Manuscript in revision*.
- *Waterschoot, J., Yzerbyt, V., Luminet, O., Van den Bergh, O., Morbée, S., Schmitz, M., Van Oost, P., Klein, O., Soenens, B., & Vansteenkiste, M. (2023). Autonomy-constraining or safety-enhancing? Acceptance and vaccination intentions rates as a function of the meanings attributed to the COVID-pass. *Manuscript in progress*.
- *Wauters, A., Vervoort, T., Dhondt, K., Soenens, B., Vansteenkiste, M., Morbée, S., Waterschoot, J., Haerynck, F., Vandekerckhove, K., Verhelst, H., Van Aken, S., Raes, A., Schelstraete, P., Walle, J. V., & Van Hoecke, E. (2022). Mental health outcomes among parents of children with a chronic disease during the COVID-19 pandemic: The role of parental burn-out. *Journal of Pediatric Psychology*, 47(4), 420–431.
- Williams, G. C., Grow, V. M., Freedman, Z. R., Ryan, R. M., & Deci, E. L. (1996). Motivational predictors of weight loss and weight-loss maintenance. *Journal of Personality and Social Psychology*, 70(1), 115–126.
- World Health Organization. (2020, May 6). Coronavirus disease pandemic. <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>

How to cite this article: Vansteenkiste, M., Waterschoot, J., Morbée, S., Van Oost, P., Schmitz, M., Klein, O., Luminet, O., Yzerbyt, V., & Van den Bergh, O. (2023). Psychological science and its societal mission during the SARS-CoV-2 pandemic: The Motivation Barometer as an evidence-informed policy instrument in Belgium. *Social Issues and Policy Review*, 1–30. <https://doi.org/10.1111/sipr.12101>

APPENDIX 1

OVERVIEW OF BRIEF REPORTS

1. Motivation Barometer (March 30, 2020). How long will we hold on to these measures? Our motivation is strong at the moment! (Report No. 1). Ghent, Belgium.
2. Motivation Barometer (April 8, 2020). Is our motivation to adhere to the measures flattening? The importance of clear and logical communication (Report No. 2). Ghent, Belgium.
3. Motivation Barometer (April 14, 2020). Psychological vitamins in times of corona fatigue (Report No. 3). Ghent, Belgium.
4. Motivation Barometer (April 21, 2020). Motivational willingness for the public marathon is dwindling: the leadership compass as a guide to motivational communication (Report No. 4). Ghent, Belgium.
5. Motivation Barometer (April 26, 2020). Fatigue during the collective marathon strikes. Evolutions in motivation, mental health, and (de)motivating government communication (Report No. 5). Ghent, Belgium.
6. Motivation Barometer (May 5, 2020). Motivation rises slightly. The government continues the positive momentum of motivational communication! (Report No. 6). Ghent, Belgium.
7. Motivation Barometer (May 12, 2020). Does “bubbling” on Mother’s Day boost our connectedness and motivation? (Report No. 7). Ghent, Belgium.
8. Motivation Barometer (May 14, 2020). Student years are the time of your life! Even during corona? (Report No. 8). Ghent, Belgium.
9. Motivation Barometer (May 19, 2020). Discomforts of face masks: how we wear them with a smile by encouraging voluntary responsibility (Report No. 9). Ghent, Belgium.
10. Motivation Barometer (July 1, 2020). What makes for an invigorating and rewarding summer vacation in corona times? (Report No. 10). Ghent, Belgium.
11. Motivation Barometer (July 16, 2020). How to maintain high motivation for tracking during this summertime? The role of risk perception, fear, and obligation (Report No. 11). Ghent, Belgium.
12. Motivation Barometer (August 19, 2020). The population is no longer motivated. How can we create a motivational framework (Report No. 12). Ghent, Belgium.
13. Motivation Barometer (September 17, 2020). What do people think are meaningful alternatives to the current bubble concept? The psychological effects of flex bubbles and a social carte blanche compared (Report No. 13). Ghent, Belgium.
14. Motivation Barometer (September 30, 2020). What do citizens think of coronabadges and the -barometer? A closer look at some motivational tools (Report No. 14). Ghent, Belgium.
15. Motivation Barometer (October 14, 2020). Even hard nuts can be cracked in a motivational way! (Report No. 15). Ghent, Belgium.
16. Motivation Barometer (October 27, 2020). Taking a closer look at some assumptions about behavior and motivation (Report No. 16). Ghent, Belgium.
17. Motivation Barometer (November 23, 2020). What makes for a happy Christmas in 2020? (Report No. 17). Ghent, Belgium.
18. Motivation Barometer (December 14, 2020). Vaccination willingness and motivation (Report No. 18). Ghent, Belgium.
19. Motivation Barometer (December 23, 2020). Christmas 2020 (Report No. 19). Ghent, Belgium.
20. Motivation Barometer (January 15, 2021). What are the psychological conditions of vaccination? (Report No. 20). Ghent, Belgium.
21. Motivation Barometer (January 29, 2021). At the end of our limits and yet persevering (Report No. 21). Ghent, Belgium.
22. Motivation Barometer (February 5, 2021). Movement as a source of well-being (Report No. 22). Ghent, Belgium.
23. Motivation Barometer (February 11, 2021). (Re)building trust: vaccination and the actors of the pandemic (Report No. 23). Ghent, Belgium.
24. Motivation Barometer (February 14, 2021). How can we reinvigorate motivation? (Report No. 24). Ghent, Belgium.

25. Motivation Barometer (March 2, 2021). The corona numbers: motivation matters! (Report No. 25). Ghent & Louvain, Belgium.
 26. Motivation Barometer (March 24, 2021). Is there motivational willingness for stricter measures? (Report No. 26). Ghent & Louvain, Belgium.
 27. Motivation Barometer (April 1, 2021). Saliva testing in schools: impact on mental health, motivation and behavior (Report No. 27). Ghent & Louvain, Belgium.
 28. Motivation Barometer (April 6, 2021). Vaccination: preferences become clear! (Report No. 28). Ghent & Louvain, Belgium.
 29. Motivation Barometer (April 20, 2021). Does the prospect of feedback motivate the population? (Report No. 29). Ghent & Louvain, Belgium.
 30. Motivation Barometer (May 10, 2021). Update on vaccination, motivation, and mental health during a transitional phase (Report No. 30). Ghent & Louvain, Belgium.
 31. Motivation Barometer (June 23, 2021). Seduce, persuade and/or inform? How to deal with vaccine doubters? (Report No. 31). Ghent & Louvain, Belgium.
 32. Motivation Barometer (July 14, 2021). Obliging health professionals to be vaccinated: a good idea? (Report No. 32). Ghent & Louvain, Belgium.
 33. Motivation Barometer (August 17, 2021). Update on vaccination, motivation, and mental health during a transition phase. (Report No. 33). Ghent & Louvain, Belgium.
 34. Motivation Barometer (September 9, 2021). Is there still motivational support for the measures in various regions? (Report No. 34). Ghent & Louvain, Belgium.
 35. Motivation Barometer (November 12, 2021). How risk-aware and motivated is the population anymore and what is the role of the corona pass in this? (Report No. 35). Ghent & Louvain, Belgium.
 36. Motivation Barometer (November 16, 2021). On the eve of stricter measures: Attitudes toward the new measures and the vaccine pass (Report No. 36). Ghent & Louvain, Belgium.
 37. Motivation Barometer (December 8, 2021). There is still support for the measures, but no longer for the corona policy (Report No. 37). Ghent & Louvain, Belgium.
 38. Motivation Barometer (December 21, 2021). Omicron, childhood vaccination and end-of-year celebrations: what do we think? (Report No. 38). Ghent, Leuven, Louvain, Bruxelles, Belgium.
 39. Motivation Barometer (January 19, 2022). Motivation, well-being and vaccination attitudes in Omicron times (Report No. 39). Ghent, Leuven, Louvain, Bruxelles, Belgium.
 40. Motivation Barometer (February 1, 2022). The CST, vaccination obligation, 1G policy, or everything on the rocks? (Report No. 40). Ghent, Leuven, Louvain, Bruxelles, Belgium.
-