REPORT 27

Saliva testing in schools: impact on mental health, motivation and behavior

The Motivation Barometer

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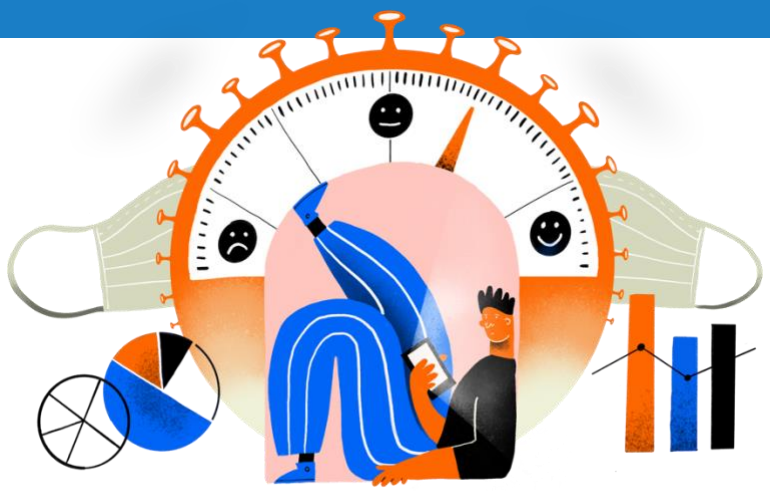


Keeping schools open is one of the priorities of the corona policy. This objective has recently come under pressure because the virus is circulating strongly in schools. Creative scenarios are therefore being sought to control the virus so that schools can remain open. For some time now, a pilot project has been conducted with saliva testing in some schools: the saliva of teachers and staff was analyzed for the coronavirus with a PCR test for three weeks. An accompanying section examined whether participation in this project affects the mental health of school personnel, and whether participation poses a potential threat to sustained adherence. In this report we summarize the results of this last part.

Comparison with a control group shows that the use of saliva testing provides a buffer against increasing worries regarding contamination and against a decline in vitality. School personnel who view saliva testing as an entry point to greater freedom show less loyal longer-term adherence to the measures. Staff who see saliva testing as a means to a collective end - ensuring student learning and well-being and avoiding outbreaks - show permanently better adherence to the measures. The representation that saliva testing allows for more freedom creates an expectation pattern focused on self-interest with potentially negative side effects for our preventive behavior. We formulate a series of recommendations for an optimal psychological framework for a broader roll-out of this project in the educational field.

Take home message

- Participation in the saliva project ...
  - ... provides a limited buffer against worries without being accompanied by a reduced sense of risk.
  - ... protects against a decline in vitality to a limited extent and provides an immediate, but limited and temporary improvement in life satisfaction.
  - ... causes slightly less faithful adherence to the face mask requirement, although other corona measures (hand hygiene, keeping your distance and limiting social contact) are followed to the same degree.

- The degree of long-term adherence to the corona measures is related to motivational aspects for participation in the saliva testing program: if one is more voluntarily motivated, sees participation more as the norm, assesses the risk of infection more highly and is more concerned about it, one will be more likely to continue to adhere to the measures. On the other hand, the expectation that saliva testing leads to increased freedom is negatively associated with adherence.

- There is a lot of enthusiasm for the project, as evidenced by the fact that ...
  - ... participants are highly voluntarily motivated for saliva testing, while extra effort and distrust play only a limited role.
  - ... the project is highly appreciated at the outset and that appreciation continues to increase throughout the project.

- A supportive and motivating role from the project leaders and school board contributes to improved motivation, sustained adherence to the measures and higher appreciation of the project.

RESEARCH RESULTS

Who participated in this study? Description of the sample and method

In this study, 56 schools participated voluntarily. Not only teachers (78%), but also surrounding educational staff (maintenance staff, educators, secretaries, and principals) participated. Both an experimental or test group (N = 1194), which consisted of a mix of Dutch-speaking (71%) and French-speaking participants (29%), and a Dutch-speaking control group (N =241) completed a pre- and post-measurement. There were 3 weeks between the two measurements. Participants in the test group took a weekly saliva test and - in addition to the pre- and post-measurement - also completed two interim, weekly measurements that monitored their mental health and behavior more closely (1 and 2 weeks after the pre-measurement, respectively). Table 1 shows the study design. Because no French-speaking control group was included, only the Flemish participants were included in the analyses of contrasts between the test and control groups. For analyses conducted exclusively on the experimental group, both Dutch-speaking and French-speaking participants were included.

Table 1 - *Research design with numbers per group and measurement time.*

	Pre-measurement	Intermediate measurement 1 (after 1st saliva test)	Intermediate measurement 2 (after 2nd saliva test)	Post measurement (after 3rd saliva test)
Timing	February 28	March 7	March 14	March 21
Test group	1194	764 (63.9%)	718 (60.0%)	493 (41.2%)
Control group	241	-	-	124 (51.5%)

Note. Percentages refer to proportion of participants in follow-up measurements relative to baseline measurement

The entire sample (pre-measurement) was on average 43 years old with 15 years of work experience (77% women). Dropout was observed within both the test and control group across the different measurement points. The number of participants in the test group decreased across the four measurement moments (see Table 1), but participants at measurement moments 2 through 4, who completed the questionnaires, were not found to be systematically different from non-participants in terms of socio-demographic characteristics or response pattern at the premeasurement. A similar conclusion was made within the control group. This indicates that neither in the experimental nor in the control group, the dropout systematic. Nevertheless, it should be noted that this was a selective sample that participated in the study: schools chose to participate themselves, and within schools, presumably mostly motivated teachers participated in the pre-measurement. These "self-selections" may cause an overestimation of the motivation and appreciation rates. We should therefore be careful when generalizing these results to other target groups.

Question 1: Is the mental health of teaching staff improving?

Do school personnel in the test group exhibit improved well-being? Different sources of worries were measured (i.e., worries about infection of self or relatives, worries about the evolution of the situation), as well as risk perception (i.e., risk of own infection or of relatives), life satisfaction and vitality. An analysis of the different response patterns in the test and control group yielded several significant results, although it should be noted that the effects are small or even very small in terms of effect size.

- Worries about infection of self and relatives and about the evolution of the situation increased in the control group, while it remained stable in the test group (see Figure 1a). Worries within the test group showed a U-shaped pattern: worries decreased in the first week, but then increased again to the initial level. We suspect that this evolution can be partly attributed to increasing corona infection numbers. The effects for worries about the situation were very small, while worries about getting infected was slightly larger. This makes a lot of sense because several other factors act on worries about the evolution of the situation than participation in saliva testing (e.g., (delayed) policy decisions; rising corona infection numbers).

- Risk awareness increased uniformly in both groups. Thus, participants in the saliva project rated the fragility of the current situation (i.e., increasing corona numbers) as high as participants in the control group, but were less concerned about it (see Figure 1b). The different actions that participants are required to perform (preparing saliva, submitting tubes, reviewing test results) may explain this persistent risk awareness.

- While control group participants experienced a decrease in vitality, this was not the case for the test group participants. Similar differences were not observed for mean life satisfaction (see Figure 1c), although test group participants appeared to experience a limited, immediate gain in life satisfaction in the first week that, however, did not persist until the post measurement (inverse U-shaped relationship).

Figure 1a. Evolution in various concerns between groups over time

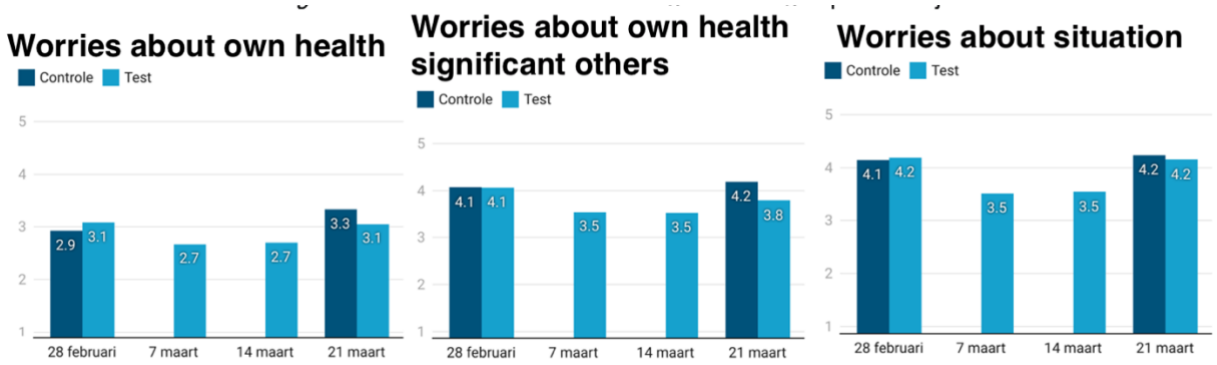
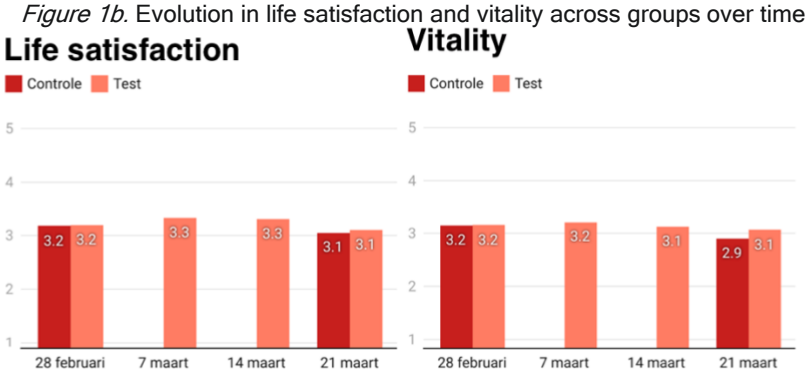


Figure 1b. Evolution in life satisfaction and vitality across groups over time



Finding 1: Participation in the saliva project provides a limited buffer against a rise in worries without being accompanied by a reduced sense of risk. It protects to some extent against a decline in vitality and provides an immediate, but limited and temporary improvement in life satisfaction.

Question 2: Do test group participants adhere less faithfully to the measures?

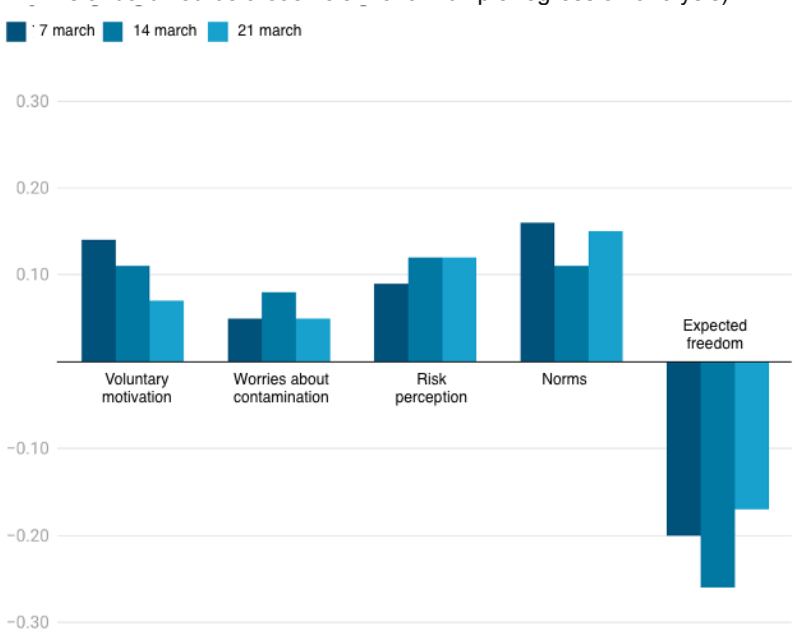
Participation in the testing program could induce a false sense of security and/or lead to risk compensation (see Trogen & Kaplan, 2021). This could have an undesirable effect on adherence to the corona measures. Figure 2 shows that participants follow measures very faithfully (cfr. high mean scores) and their participation in the saliva project was not associated with an average decrease in following measures overall, although a slight decrease was noticeable for wearing face masks. In a second step, we examined whether participants' motivational profile at the start of the program mattered for adherence to the measures at the three follow-up measurements (see Figure 3). Participants who viewed the testing program at its start as an entry point to more freedom for themselves, were less

likely to follow the measures during the following three weeks[1]. In contrast, those who saw the saliva testing as protecting themselves and others and as a means of keeping schools open, remained more adherent to the measures over the longer term. The more participation in the saliva project was experienced as a norm at school, and the more risk awareness and worries test group participants reported, the more faithfully they continued to adhere to the measures over the following three weeks. The effects observed are limited, but this is somewhat understandable because it was not motivation for adhering to the measures, but motivation for participating in the saliva tests that was surveyed. There may be a spill-over effect from motivation for saliva testing to motivation for the measures, which in turn then show a stronger relationship with behavior.

Figure 2. Evolution in following different corona measures between groups across measurement occasions

[1] This negative correlation for the expected benefits of the saliva project was not found for the expectation of increased relatedness and safety. Thus, freedom aspirations appear to be primarily a pitfall for sustained adherence.

Figure 3. Unique contribution of various motivational aspects in adherence to the measures (expressed using a standardized beta coefficient of a multiple regression analysis)



Motivational aspects

- **Voluntary or autonomous motivation:** expresses the degree to which one is fully convinced of the added value and necessity of saliva testing, for example, because it provides protection for oneself, loved ones, or the population and helps keep schools open.
- **Norms:** expresses the degree to which one perceives that others think participation in these saliva tests is important.
- **Outcome Expectations:** expresses the expected positive effects of participating in saliva tests, including expectation of increased freedom, relatedness with others, and safety.
- **Effort** expresses the degree to which getting tested requires a great deal of effort.
- **Distrust** expresses the degree to which one distrusts the effectiveness of saliva testing or the person recommending saliva testing.

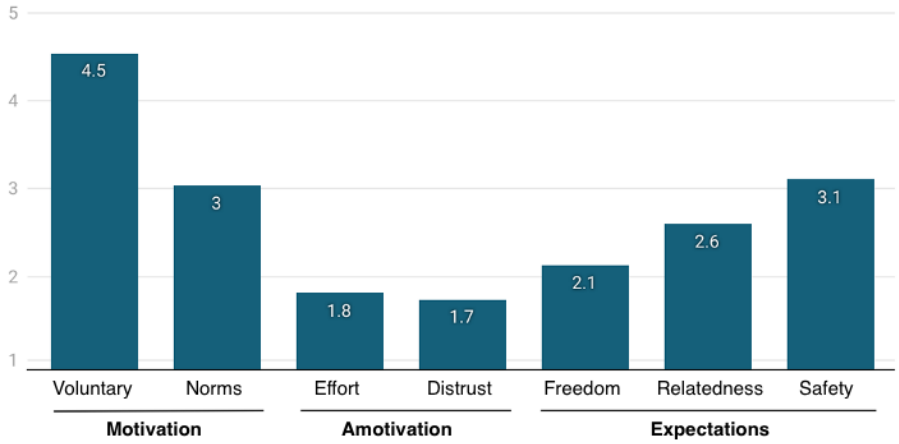
Finding 2: Test group participants are slightly less faithful in adhering to the face mask requirement, but do not differ from the control group for the other corona measures (hand hygiene, keeping a distance, and limiting social contact). The perception that saliva testing leads to increased freedom is negatively associated with adherence, whereas the belief in the collective importance of testing and the perception that participation is the norm are positively associated with adherence.

Question 3: To what extent is the project valued?

Several results show that the saliva testing project is well appreciated.

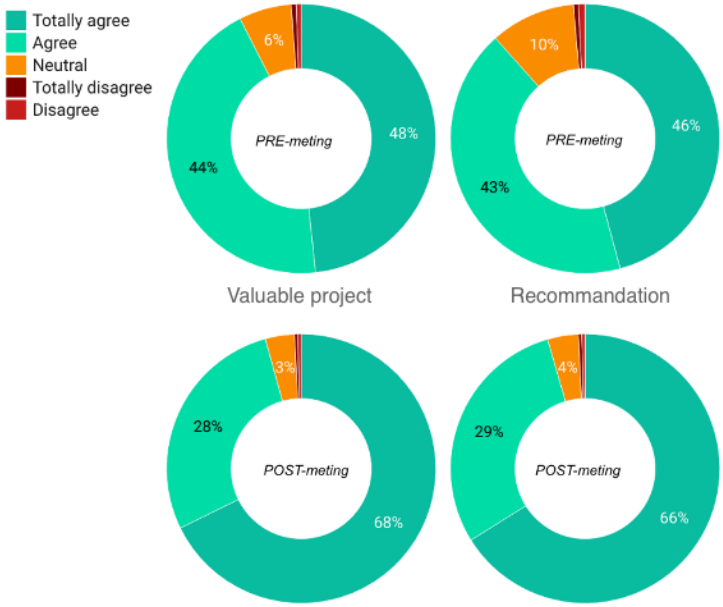
- On average, participants are strongly convinced of the importance of saliva testing at the start of the project. Demotivating factors weigh much less heavily (see Figure 4). Furthermore, it appears that participants have varying expectations about the potential benefits of this project.

Figure 4. Motivation for participation in the saliva project



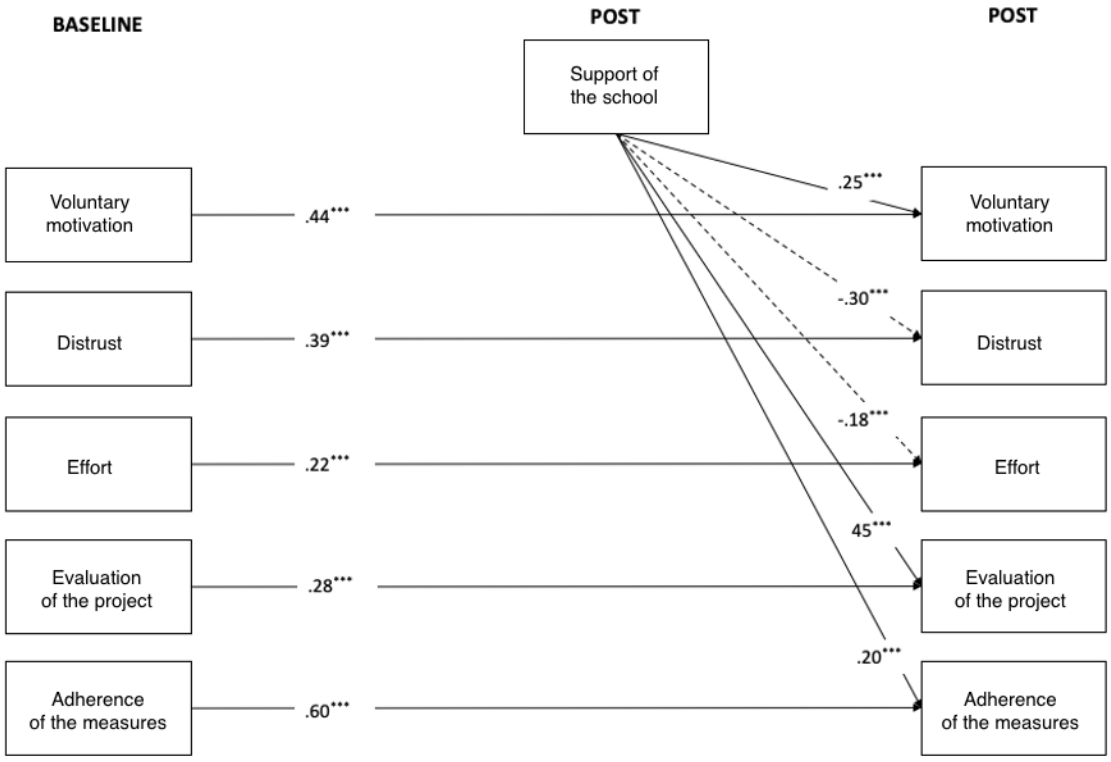
- The project is positively evaluated at the start and this appreciation continues to rise in the post measurement. 96% finds this a (very) valuable project and 89% would (very) strongly recommend it to other schools (see Figure 5). One caveat: participants who received unclear test results (7%) did not show increasing appreciation across the measurement occasions and developed slightly more distrust in the saliva tests.

Figure 5. Rating of the project during pre- and post-measurement.



- Support from the project managers and management that was perceived as helpful and motivating contributed to an increase in voluntary motivation, higher appreciation of the project, better adherence, and a decrease in demotivating factors (distrust, difficulty) compared to the premeasurement (see Figure 6).

Figure 6. Role of support from the school on motivational factors over time



Finding 3: The project is highly appreciated at the start and this appreciation increases towards the end. Participants are highly motivated to participate in the saliva tests. A supportive and motivating attitude among the project leaders and the school board stimulates motivation and increases appreciation of the project.

POLICY RECOMMENDATIONS

Motivational interventions for executives and project managers

Several interventions are possible to encourage favorable types of motivation for the project and to remove barriers to participation:

Type of (lack of) motivation	Motivational action
Voluntary motivation	• Elicit the "**why**" and cultivate a **prosocial purpose**: ✓ Safety: avoiding outbreaks and protecting each other ✓ Safeguard wellbeing & learning by keeping schools open ✓ Strengthen connection and motivation to stay on top of measures • Have school personnel **testify** about their motivation; develop a video clip with a motivational testimonial to share with interested schools • Follow the **rhythm of the school staff** to decide to participate (this is: avoid external pressure). Engage with teaching staff and offer choice about whether or not to participate. Provide time for reflection, while maintaining connection. • Establish the commitments made with the school in **consultation with** all stakeholders (staff, students, parents...).
Realistic expectations	• Point out the **importance of solidarity and collective interest** • **Discourage self-interest as a motive** by explicitly stating that tests are not a gateway to individual freedom

Realistic risk awareness	• Create **realistic risk awareness** by transparently communicating the ongoing risks after negative testing: ✓ Develop a **video clip** that demonstrates the abstract risk of permanent infection ✓ Continue to emphasize that following preventive measures is and will continue to be essential • Show **infographics** that clarify what a false negative test means
Effort	• Provide a clear, **visualized step-by-step plan** so people have a good understanding of what is expected • Have teaching staff testify about the procedure and efforts • Concretize commitment through the formulation of **implementation intentions, which** specify "who does what when what happens". E.g. "If a student needs to be quarantined, X takes care of French's notes and Y takes care of chemistry's notes. We deliver these by mail on that specific day" • Do not formulate commitment only in a negative way (e.g. children are not allowed to go to school), but provide a **positive, supportive alternative** (e.g. what is expected from parents if their child has to stay at home? What tools are there to combine work and family at that time? How can they communicate this to their employer?)
Distrust	• Provide sufficient information about saliva collection. ✓ Refer to **Prof. Goossens' explanations** on the use of the saliva tests ✓ Compile a rubric of **"Frequently Asked Questions"** or record a video clip with answers to questions
Normative character	• **Share your commitments** with students, CLB staff, teachers and parents = make public ✓ Newsletter ✓ Website ✓ Posters ✓ Keychains etc. • Provide feedback on how many people were quickly detected thanks to the project = **make the gains explicit**

Pitfalls and areas of concern

For the implementation of this project, the following points of interest should be taken into account to optimize its reception.

- **Appropriate framing:** The launch of this action must be well explained so that actors in the educational field (teachers, schools, CLB staff) do not perceive the project as an additional burden, a show of mistrust or a sign of lack of appreciation for the efforts they have been making for many months. It is best framed as an action to improve the physical safety of all involved and that adds value to the well-being of students and school staff.

- **Involvement of the work field:** The entire work field must be involved in order to arrive at a supported and feasible approach. The motivational factors identified in this report should be given concrete form in consultation with the field. It is best that a 'road-book' is drawn up with the various crucial steps and methodologies. Ideally, the roadmap should be evaluated on a regular basis and adjusted if necessary.

- **Public component:** publicizing the commitment statement can motivate the staff to participate in the project, but it can also motivate other schools to adopt a similar approach. A pitfall of widely publicizing a commitment statement, however, is that it brings a pressure with it to achieve results and may lead to culpabilization if there is a local outbreak ("Your commitment was not strong enough, now look!"). The commitment is therefore best shared only between the actors involved in a school and registered anonymously on a public website. In the latter case, it becomes clear how many schools make a commitment.

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