THE IMPACT OF TEMPORAL STRUCTURES ON THE TEMPORAL SCHEMATA OF STUDENTS DURING COVID-19

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ABSTRACT

This study uses a mixed method approach to explore the impact of imposed Covid-19 measures on the temporal schemata of students. Surveys and interviews were conducted during the first and second Covid-19 wave in Belgium to explore how behavioral responses change over time. The study is based on the Temporal Cognitive-Affective Processing System developed by Shipp and Richardson (2021). The results indicate that restrictions on social contact have high impact on the daily lives of students and are not sustainable over time.

INTRODUCTION

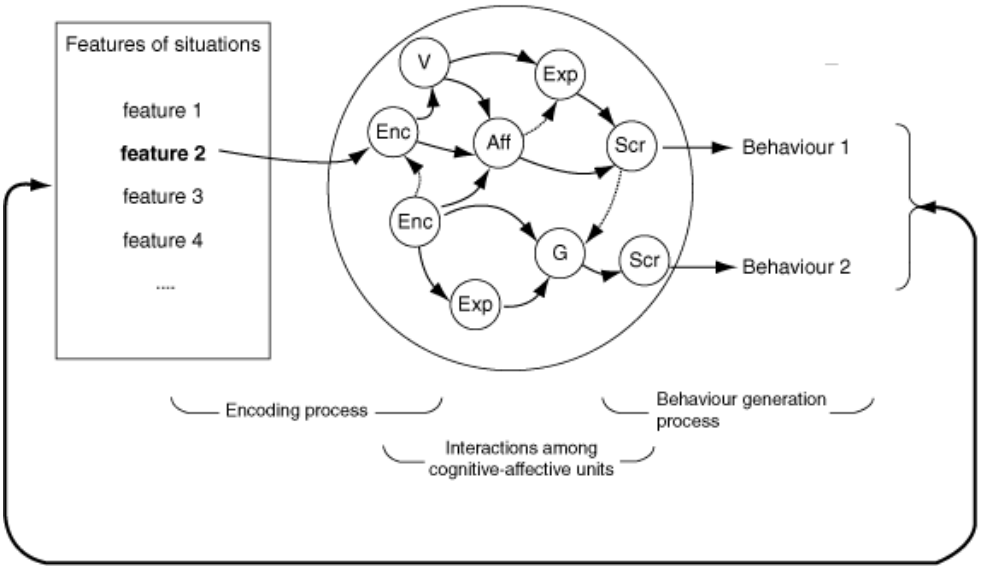
The Covid-19-outbreak has been taken control of our lives for almost two years now. On March 10th 2020, Belgium was confronted with its first death due to Covid-19. Only two days later, the Belgian government was forced to take extreme measures to restrict social interactions and this way control the spread of the virus. These measures implied a closure of schools, bars, restaurants and non-essential shops. Working from home became mandatory if possible and universities switched to complete remote learning. Non-essential displacements were prohibited, as well as outside gatherings with more than two people. Visiting friends and family was also not allowed. Originally these measures were enforced until April 2020. However, it soon became clear that we would not return to a normal situation any time soon. By the end of March 2020, The Flemish universities decided to suspend the on-campus teaching activities until the end of the term. Drastic adjustments to the exams in June 2020 were also necessary. At the peak of this first Covid-19 wave, 1285 Belgian patients were admitted in an intensive care unit and over 400 people died per day (Sciensano, 2020b). The first relaxations could be taken during May 2020, and by the end of June 2020 we had returned to a more or less normal situation.

However, this was short-lived. By the end of July 2020, the number of infections had increased again and some small restrictions were reinforced. Ghent University decided to start the new academic year in a hybrid setting, meaning that small groups of students were welcome on-campus while the remainder followed lectures online. In October 2020, lock-down measures were taken again due to an extreme increase in occupancy rate of intensive care. Again bars, restaurants and sport-clubs were closed. A complete ban on non-essential displacements was not introduced again, but instead a curfew from midnight until five a.m. was installed. Ghent University also completely switched back to remote learning at least until the end of March 2021. Social contact was also greatly reduced. The majority of these measures lasted until May 2021. After all, by then vulnerable people and health care workers were vaccinated. At the peak of this second Covid-19 wave, 1464 patients were admitted in an intensive care unit and around 180 people died per day (Sciensano, 2020a).

These regulations and prohibitions have huge social, emotional and economical implications. Some of the measures change our relationship with time. An example is the curfew. This measure implied that nobody was allowed to leave their house from midnight until five a.m. But also other measures that do not directly include a dimension of time, like working from home or remote learning, drastically change our daily routines and therefor have an impact on our individual temporal schemata. Temporal schemata are generalized cognitive frameworks that give meaning to experiences related to time. They contain an individual's knowledge about clock time. Examples are being a morning person, always arriving late or preferring to work on a tight deadline (Labianca, Moon and Watt, 2005). The temporal schemata of each individual are formed by and confronted with a process of temporal structuring. Temporal structures are imposed by organizations and create a rhythm of organizational activity. They are shared between people. Examples of temporal structures are the concept of weekends, office schedules and deadlines (Orlikowski and Yates, 2002). There are continuous interactions between the individual temporal schemata and temporal structures of organizations. These interactions lead to behavioral responses.

Shipp and Richardson (2021) introduce the Temporal Cognitive-Affective Processing System (T-CAPS) in which they propose that in the context of time, temporal schemata and temporal structures operate within a person-situation interaction. This assumption is based on the Cognitive-Affective Processing System (CAPS) that states that a behavioral response is the result of the interaction between features of the situation and the cognitive-affective units of an individual. These cognitive-affective units include: encodings; expectancies and beliefs; affects; goals and values; competencies and self-regulatory plans. The CAPS explains the variability in behavior between different individuals, and between different situations within the same individual. Figure 1 demonstrates the mechanism captured in the CAPS. An individual will analyze the features of a certain situation in the encoding process. Subsequently the cognitive-affective units will start to operate and will generate a behavioral response (Mischel and Shoda, 1995).

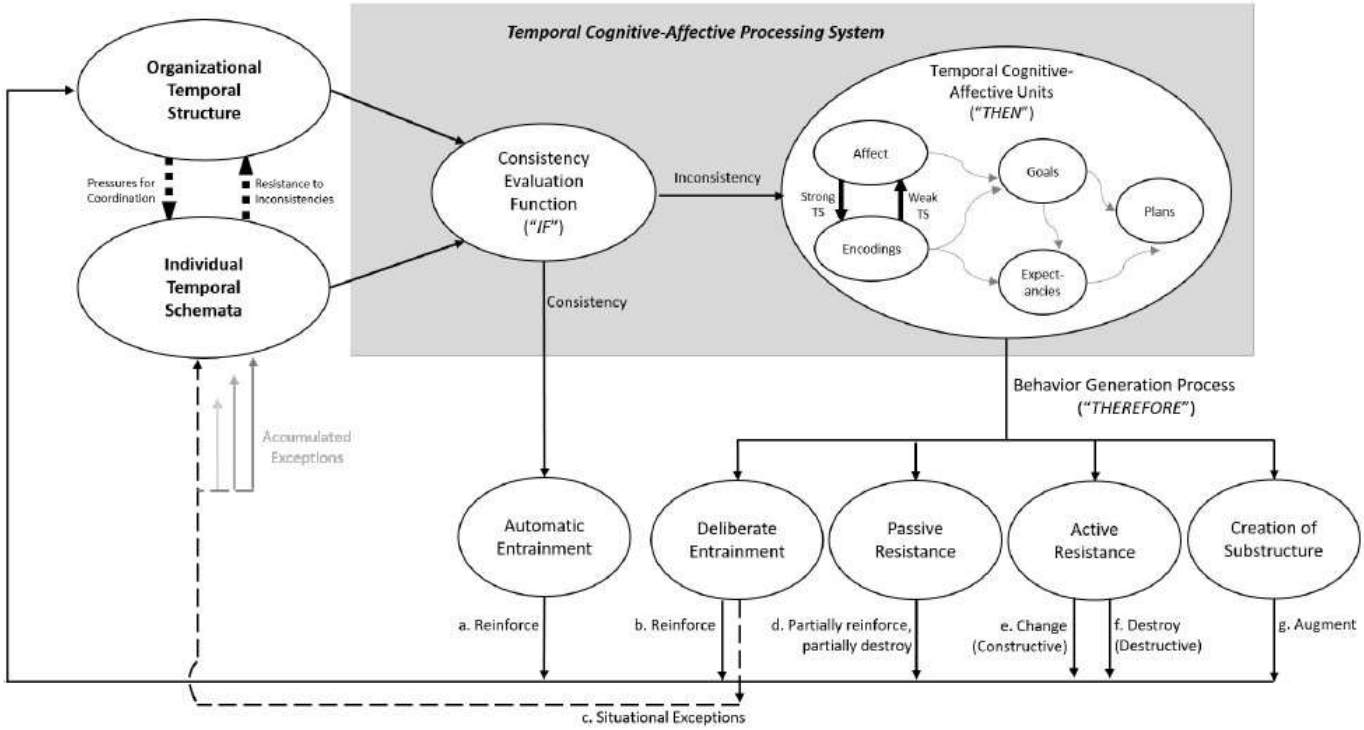
Figure 1: The Cognitive-Affective Processing System (CAPS) (Mischel and Shoda, 1995)



The T-CAPS is an extension of the CAPS. The T-CAPS (see figure 2) suggests that when individual temporal schemata are confronted with organizational temporal structures a consistency evaluation follows. When there is consistency, the individual will comply to the imposed temporal structure without much thought. This is called *automatic entrainment*. For individuals always going to bed at or before midnight, the imposed curfew between midnight and five a.m. is consistent within their temporal schemata and will lead to automatic entrainment (Shipp and Richardson, 2021).

However, when there is inconsistency, the temporal cognitive-affective units will interpret the characteristics of the temporal structure and will generate one of four possible behavioral responses. The first one is *deliberate entrainment*. This implies that the individual will completely comply with the temporal structure, based on a deliberate choice since the individual understands it is important for themselves (*self-interest*) or for society (*social interest*). In the example of the curfew, individuals will not leave their home at night because they understand it is a necessary measure to combat the virus. The next possible behavioral response is *passive resistance*. Passive resistance is shown when an individual entrains partially, but not completely. They resist in a limited way. This could mean that an individual usually follows the curfew, but not on New Year's Eve because on this night it is too inconsistent with his/her individual temporal schemata and this person is therefore willing to take a risk. *Active resistance* is another possible behavioral response. In active resistance, the individual does not comply with the temporal structure at all and does it with explicit verbal or physical actions. This can occur in a constructive way (e.g., voicing suggestions about other options) or a destructive way (e.g., protest and violence). The last possible behavioral response is *creation of substructure*. This usually comes from high information uncertainty about the temporal structure. Individuals need to fill in the gaps themselves and this leads to the creation of temporal substructures. An example of this is leaving your friends' house at six a.m. instead of one a.m. The individual is technically obeying the rules, since they are not on the street during the night, but the purpose of the curfew is defeated (Shipp and Richardson, 2021).

Figure 2: The Temporal Cognitive-Affective Processing System (T-CAPS) (Shipp and Richardson, 2021)



Shipp and Richardson (2021) use the characteristics of interpersonal situations (Reis, 2008) to explain how behavioral responses are generated. They include outcome interdependence (the degree to which the two parties have influence on each other's outcome), mutuality of power (the degree to which the power of the two parties is balanced), anticipation of future interaction (the expectation of interaction over the long term) and information uncertainty (the availability of the needed information). Lastly, the T-CAPS also suggests that behavioral responses, apart from automatic entrainment, may change over time (Shipp and Richardson, 2021).

In this study the Covid-19 measures are taken as temporal structures that impact the temporal schemata of students. Students were faced by both governmental measures and measures taken by the university. This resulted in specific challenges and make them an interesting scope for the study. *We aim to explore how students respond to imposed covid-19 measures, how these responses change in the different Covid-19 waves and by which context characteristics the behavioral responses are influenced.*

METHOD

This study uses a mixed method approach. Web based surveys were distributed among students of Ghent University during the two largest Covid-19 waves in Belgium up to now, respectively in April - May 2020 and December 2020 - February 2021. In the survey, students were confronted with descriptions about current Covid-19 measures and were asked to indicate the type of behavioral response that best matched their response to the measure in real life. The response options were: automatic entrainment, deliberate entrainment – self-interest, deliberate entrainment – social interest, passive resistance, active resistance and creation of substructure. The surveys also included socio-demographic questions, like gender, faculty and year of study and work regime.

The first survey included three measures taken by the university: the rescheduling of on-campus exams, the replacement of some 'on-campus' exams to online exams and the switch from on-campus lectures to online lectures. It also included two measures taken by the government: the ban on non-essential displacements and the ban on gatherings and visitations. The second survey included one measure taken by the university, namely the switch from on-campus lectures to online lectures. Three measures taken by the government were also included: the curfew, the closure of bars and restaurants and the restriction on gatherings and visitations. Appendix 1 gives detailed descriptions of the measures as they were included in the surveys.

In addition to the two surveys, interviews were also conducted during the two largest Covid-19 waves. In the first set of interviews, ten students of Ghent University were interviewed before the development of the

survey. The interviews focused on exploring which type of measures had the most impact on the daily lives of students and why. The interviews helped with the development of the survey. In the second set of interviews, twenty students of Ghent University were interviewed. This time, interviewees filled in the renewed survey before the interview took place. These interviews focused on exploring the internal process that generated the behavioral responses indicated in the survey.

Convenience sampling was used to recruit the participants of the surveys and the interviews. However, we tried to achieve a good mix of students with different socio-demographic by contacting working students and different years of study.

FINDINGS

The socio-demographics

The first survey was filled in by 442 students. 76 per cent of them were female and 22 per cent lived together with at least one risk patient for Covid-19. A risk patient is defined as a person over 65 years of age, a person with diabetes, heart, lung or kidney disease or a person whose immune system is weakened. Most students were in their linking course (48 per cent) or master year(s) (35 per cent). The most frequent faculties of study were Medicine and Health Sciences (66 per cent) and Economics and Business Administration (26 per cent). 85 respondents were working students, working full- or part-time.

Six of the ten interviewees were female. Most of them (seven) studied at the faculty of Economics and Business Administration. The remainder were students from the faculties of Psychology and Educational Sciences, Political and Social Sciences and Arts and Philosophy. Five interviewees were in their master year(s), four in their second or third bachelor year and for one interviewee it was their first year studying at the university. Information about working regime or whether the interviewees lived together with a risk patient, is not available.

The second survey was filled in by 454 students. 81 per cent of them were female. 23 per cent of the respondents lived together with at least one risk patient for Covid-19 and five per cent were at risk themselves. Most students were in their master year(s) (35 per cent) or linking course (33 per cent). The most frequent faculties of study were Medicine and Health Sciences (55 per cent) and Economics and Business Administration (17 per cent). 84 respondents were working students, working full- or part-time.

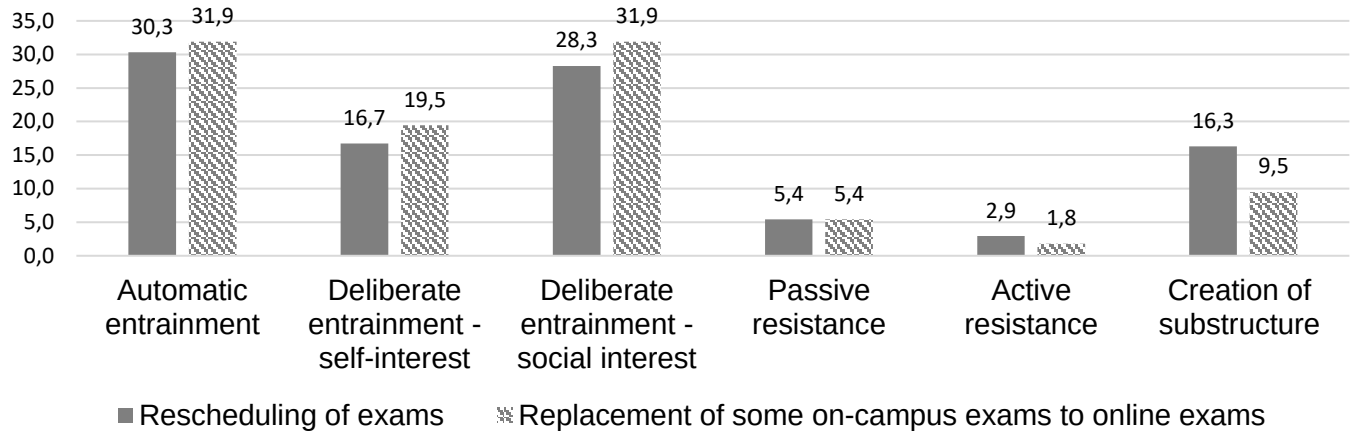
Twelve of the twenty interviewees were female. Thirteen of the interviewees studied at the faculty of Medicine and Health Sciences. The remainder were students from the faculties of Economics and Business Administration, Law and Criminology and Psychology and Educational Sciences. Half of the interviewees were in their master year(s), six in their linking courses and the remainder in their second or third bachelor year. Seven interviewees worked full- or part-time and five lived with a risk patient or were risk patients themselves.

A large part of our sample in both surveys and both set of interviews consisted of students from the faculty of Medicine and Health Sciences and the faculty of Economics and Business Administration. This is due to the connections the researchers have to those faculties.

The behavioral responses to the Covid-19 measures

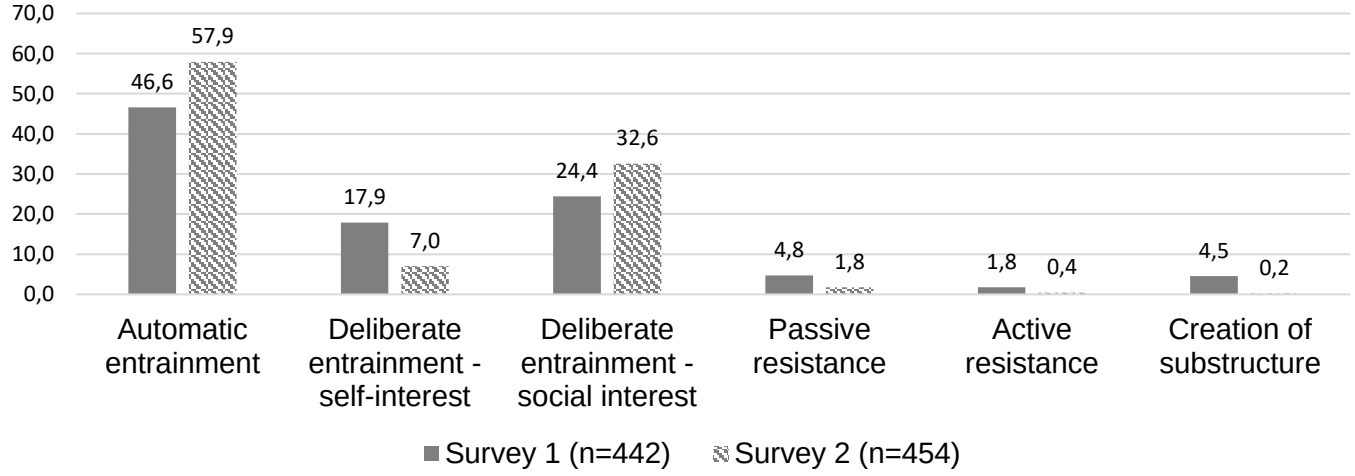
The distribution of the behavioral reactions on measures concerning the exam period of the students in June 2020 are presented in figure 3. A similar pattern in behavioral responses is visible between the rescheduling of exams and the replacement of some on-campus exams with online exams. Automatic entrainment and deliberate entrainment out of social interest are most present, followed by deliberate entrainment out of self-interest and creation of substructure. Only eight per cent of the respondents show passive or active resistance. Seven interviewees experienced feelings of anxiety due to the uncertainties regarding the exams.

Figure 3: The behavioral responses to the rescheduling of exams and the replacement of some on-campus exams to online exams, in per cent (survey 1, n=442)



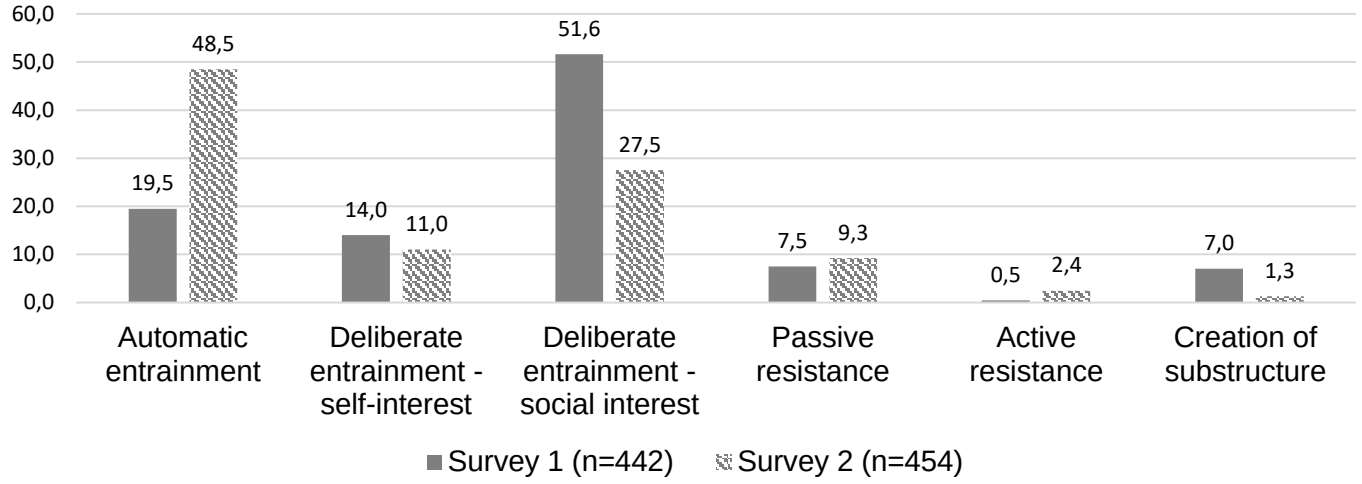
Both surveys included a measure about the switch from on-campus lectures to online lectures. There is a similar pattern between the results in the first and second survey (i.e. first and second Covid-19 wave) (see figure 4). Most students show automatic and deliberate entrainment. However, there is a small shift visible from deliberate entrainment out of self-interest and resistance in the first survey to automatic entrainment and deliberate entrainment out of social interest in the second survey. According to the interviewees, automatic entrainment is shown because they see little room for resistance, remote learning fits better within their schedule or they do not usually physically attend lectures anyway. In the first set of interviews, an interviewee complained about a lack of uniformity between online courses, while in the second set of interviews it was mentioned that it was clear that professors had gained experience in remote learning.

Figure 4: Comparison between the first and second survey of the behavioral responses to the switch from on-campus lectures to online lectures, in per cent



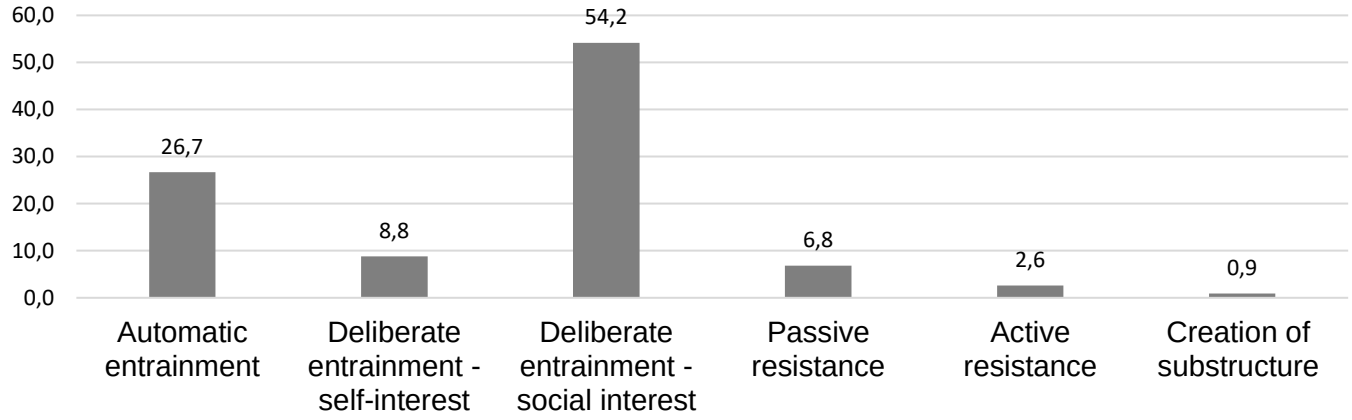
The governmental measure of the ban on non-essential displacements from the first survey, is similar to the measure of the curfew in the second survey. After all, they both entail a restriction in mobility. The former was however way more extreme than the latter. Figure 5 represents the behavioral responses to the ban on non-essential displacements and the curfew. The pattern of behavioral responses is fairly different between the two measurements. The complete ban of non-essential displacements is mostly followed out of deliberate entrainment, while there is more automatic entrainment visible in the measure of the curfew. Even though students understand that the ban on non-essential displacements is a necessary measure, the results show that the measure is not consistent within their temporal schemata. In the second set of interviews, six interviewees mention that the measure of the curfew was not hard to follow because they usually do not go out at night anyway, especially not when bars and restaurants are closed. In both time periods, deliberate entrainment out of self-interest is shown because of the fear to get fined.

Figure 5: Comparison between the behavioral responses to the ban on non-essential displacements in the first survey and the curfew in the second survey, in per cent



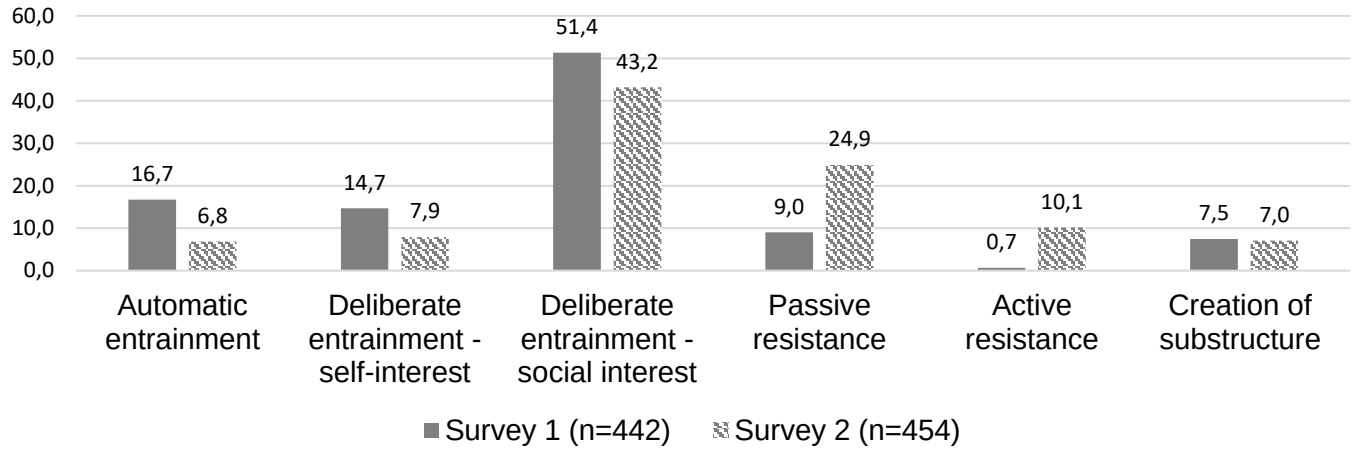
During the second Covid-19 wave in Belgium, bars and restaurants were closed again. This measure was included in the second survey. The distribution of the behavioral responses on this measure is represented in figure 6. Students mostly show deliberate entrainment out of social interest. Ten interviewees state that the reintroduction to this measure was hard. They, however, understand that it was a necessary measure to take.

Figure 6: The behavioral responses to the closure of bars and restaurants, in per cent (survey 2, n=454)



Lastly, both surveys included a measure regarding the restriction of social contact. In the first Covid-19 wave this restriction was more extreme than in the second Covid-19 wave. The results (see figure 7) however show a clear increase in passive and active resistance in the second survey compared to the first. After all, the interviews indicate that these measures started to weigh on the mental health of students. Some interviewees also mention that the regulations are unclear. Deliberate entrainment out of social interest remains the most shown response in both questionnaires. This demonstrates that most students understand the severity of the situation. Especially students who lived together with a risk patient or who worked in health care, were motivated to follow the restrictions.

Figure 7: Comparison between the first and second survey of the behavioral responses to the restriction in social contact, in per cent



DISCUSSION

This study aimed to explore how students respond to imposed Covid-19 measures and how these responses change over time by using a mixed-method approach including surveys and interviews. The descriptive analysis of the survey show that most students entrain towards the measures taken by the university in both covid-19 waves. The interviews indicate that the students mostly follow the university measures because there is little room for resistance. This can be explained in terms of an asymmetric power dynamic (Reis, 2008) between the student and the university and a lack of the students' competency to show resistance (Mischel and Shoda, 1995). A slight increase of automatic entrainment is visible with respect to the measure of remote learning in the first Covid-19 wave compared to the second. This could mean that students are getting used to this form of education. It is also possible that the experience of the universities and professors with online teaching has increased.

In the measures taken by the government there is more difference visible between the two measurements. The resistance to the measures grows over time, especially when they interfere with students' social contact. The results show that the complete ban of non-essential displacements from the first Covid-19 wave is less consistent with the temporal schemata of students than the curfew from the second Covid-19 wave. Even though they both entail a restriction in mobility, the impact of them is fairly different. Most students show deliberate entrainment towards the closure of bars and restaurants. They understand that this is a necessary measure, but it is a hard pill to swallow. It is not consistent with their individual temporal schemata.

Deliberate entrainment is also the most shown response in the two measures restricting social contact. The students that show entrainment behave this way because they understand it is vital to combat the pandemic. The high outcome interdependence (Reis, 2008) in this situation makes the students act more cooperative to obtain the desirable outcome. When comparing the two measurements, the active and passive resistance towards this measure increases over time. Students that show resistance, do so because the rules are either too unclear or too hard to comply with. The ambiguity in the measures points to a high information uncertainty (Reis, 2008). Students who show resistance because the measure is too hard to follow, may have a lower level of competence in dealing with less social contact (Mischel and Shoda, 1995).

A general finding is that students who combine their studies with work in healthcare or students who have a family member that is a risk patient for Covid-19, find it easier to follow the regulations. Their encodings, affects and values are different (Mischel and Shoda, 1995).

In a next study we want to obtain more insight into why the behavioral responses change over time. We hypothesize that the duration of the measures plays an important role.

VALUE

This is the first study to apply the T-CAPS in the context of customers. It will contribute to the understanding of the behavior of customers when confronted with temporal phenomena in service research. By using data collected during two different time periods, the study also provides insight into how these behavioral

responses change over time. Comparing temporal structures imposed by different institutions adds value as well. It demonstrates that amongst others power balance is an important factor in generating behavioral responses. Lastly, by including students with diverse socio-demographics, the impact of living environment is also studied.

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APPENDICES

Table 1: The description of the measures included in the surveys

Imposer	*Measure*	*Description*
Survey 1 (April – May 2020)		
University	Rescheduling of on-campus exams	On March 26th 2020 Ghent University decided to reschedule the on-campus exams in June in order to comply to the guidelines regarding social distancing. The exam period will start a week later than initially planned. By consequence, your initial exam schedule may have been adapted. If the 1st of June is unachievable, the exams will start somewhere between the 1st and the 15th of June. If the 15th of June is still unachievable, the start will be postponed to the 10th of August.
	Replacement of some on-campus exams to online exams	On March 26th 2020 Ghent University decided that the evaluation for some courses will be changed to online evaluation, instead of written, on-campus exams.
	Switch from on-campus lectures to online lectures	On March 13th 2020 Ghent University decided to switch to remote learning. On March 20th it was communicated that all on-campus teaching activities will be suspended until the end of the term.
Government	Ban on non-essential displacements	On March 18th a ban on non-essential displacements was installed. This entails that you are only allowed to leave the house for the following actions: work, grocery shopping, going to the doctor or a pharmacy, offering assistance to an acquaintance that is less self-reliant and outdoor physical activity.
	Ban on gatherings and visitations	As of March 18th gatherings with more than two people are prohibited. Only people that live under the same roof are allowed to go outside with more. Visits to friends and family that do not live under the same roof are forbidden, unless the visit is aimed at offering help to someone who is less self-reliant.
Survey 2 (December 2020 – February 2021)		
University	Switch from on-campus lectures to online lectures	On the 26th of October 2020 Ghent University decided to switch all on-campus lectures to only online lectures again. Before that, small groups of students were allowed on campus.
Government	Curfew	Since October 19th 2020 a curfew is set in Flanders. Specifically this means that you cannot go outside between midnight and five a.m. without a valid reason. A valid reason means an 'essential, non-delayable displacement'. This is for example a displacement for work or urgent medical reasons.
	Closure of bars and restaurants	Since October 19th 2020 bars and restaurants are closed again. However, they can offer take-out until ten p.m. The sale of alcohol is forbidden after eight p.m.
	Restriction on gatherings and visitations	Since October 19th the number of visitors in a house is scaled down to one at a time. Outside gatherings are limited to four people. A physical distance of 1,5 meter is required.