My time or yours? Enriching service operations with intersubjective time

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Abstract

In operations management the notion of time is frequently approached from an absolute perspective. The relevance of customer experience has raised interest in subjective views on time. In this paper we discuss theory on temporal schemata (of individuals) and temporal structures (of organizations) and how the two interact, i.e. intersubjectivity. Empirically, we address this interplay in the context of oncology patients. We conclude that the design of temporal structures, for instance, appointment systems as frequently used in service operations, should be based on better understanding of the network of intersubjective time relationships in which a customer is embedded.

Keywords: Subjective time, Intersubjective time, Entrainment, Oncology

Introduction

In operations management, we are used to think, speak and write of ‘time’ as something absolute, like clock time. Steps in an operational process, e.g., the check-in, the stay, the check-out of a hotel booking, take time: a minute, a week, an hour. Likewise, performance of operational processes can be measured in terms of speed, duration, timeliness. All this belongs to what has been called the objective side of ‘time’. In addition, there is an increasing interest in the subjective side of time. Subjective time relates to how individuals experience and perceive time. This *subjective* perspective of time has for example been studied in the waiting time literature and is well-known as the psychology of waiting (Sridhar, 2001). However, we note that different studies do not use a uniform definition of subjective time.

In a recent study Shipp and Jansen (2021) have developed a framework for studying subjective time based on a comprehensive literature review covering various disciplines. Subjective time is hereby defined as "the experience of the past, present and future which

occurs as individuals *(intra*subjectively) and collectives (*inter*subjectively) mentally travel through, perceive, and interpret time" (Shipp and Jansen, 2021, p.8). This definition takes into account that not only individuals can perceive and interpret time, but also collectives (such as organizations or societies). In the intersection between organizations (such as a hospital) and individuals (such as a patient), temporal structures play an important role (Pedersen and Roelsgaard, 2020). *Temporal structure* is defined as a patterned organization of time, used by humans to help them manage, comprehend, or coordinate their use of time (Wu, 2009). A clear example is a deadline, but one can also think of work schedules, appointment systems which are amply used in service operations management (Mondschein & Weinstraub, 2003) and in health care operations management (Pan et al., 2021; Devaraj et al., 2013). For instance, Pedersen and Roelsgaard (2020) show how the introduction of a cancer pathway imposes the temporal structures in the treatment plan and work practices in, among others, a hospital. The cancer pathway delivers better synchronization, order and predictability for patients and healthcare professionals. Pedersen and Roelsgaard. (2020) also call for more attention in future research to the patient's experience of the new temporal structure. Notably, multiple temporal structures from within and outside the hospital all have an impact on patient experience (Jowsey, 2016) and patient behavior (Shipp and Richardson, 2019).

This paper contributes to the literature on time in service and healthcare operations by *empirically* showing how *multiple temporal structures* ***inside and outside the hospital*** shape the experience of cancer care patients *in their service delivery process,* using *a coherent conceptual framework of objective and subjective time*. This leads to the insight that the patient experience is not only determined by what the patient individually perceives and interprets in the past, present and future, but also by ***multiple*** collectives (such as a hospital department or the employer of the patient) that impose temporal patterns. This confrontation then ultimately leads to certain behaviors of adaptation or resistance (Shipp and Richardson, 2019).

Background

Given that the organization of healthcare operations is time-driven (Sterponi et al., 2019), the time we spend in, for example, a hospital's waiting room is essential to our judgment of the service interaction and experience. The spent time can be viewed from an objective as well as a subjective perspective. This leads to the well-known higher-level conceptualization of objective time and subjective time (Shipp et al., 2021; Carlson et al., 2019).

Objective time, or clock time, is the common answer to the question "What time is it?". It is, for instance, the number of hours between the moment of arrival at the hospital and the start of the chemotherapy. Objective time is absolute, linear, measurable and predictable. It focuses on time use, i.e. how much time is devoted to work and how that time is allocated over a particular period (Feldman et al., 2020) or the number, duration and the utility of the events during a certain period.

While clock time is linear in a sense that the present follows the past and precedes the future, subjective time is contextual because the meaning of a particular experienced event is dependent upon flow of past, present, and future in any direction and the individuals and groups undergoing the experience (Shipp et al., 2009). Patients frequently experience the duration of the time-period between arrival at the hospital and the start of the chemotherapy session as too long. This can be influenced by different contextual factors such as the prior visits to the chemotherapy unit, the interaction with the caregivers

at the unit and the environment in which they have to wait (Dagger et al., 2007; De Pourcq et al, 2019), but also the imagined future of being frequently confronted with these sessions.

In the evolving temporal research, it is also recognized that perception and experience of subjective time can be formed and shared on different levels such as the individual level (micro level), the organizational level (meso level) and the social and cultural level (macro level) (Carlson et al., 2019). There can be conflicts regarding subjective time within and between these different levels, to be referred to as *intersubjective time*. Although cancer patients want to know the results of the CT scan as soon as possible, the policy of the hospital can mandate that results should first be discussed in a multi-disciplinary meeting before communicating them to patients. These meetings are sometimes scheduled only once a week, leading to a longer waiting time for the patient. In this example of intersubjective time, the individual temporal schemata of the patients (micro level) are not in line with the rhythm of organizational activity of the hospital (meso level), i.e. the temporal structure of scheduled multi-disciplinary meetings as prescribed by the hospital.

Temporal schemata are "generalized cognitive frameworks that give form and meaning to experience and contain general knowledge about time" (Labianca et al., 2005) and help individuals to interpret time as being at the right or wrong time, or being urgent or not (Shipp and Richardson, 2019). One of the primary functions of schemata is to help a person identify, interpret and react to incoming stimuli (Labianca et al., 2005), which are created by an event. When these events are repetitive and inevitable such as the CT scanning to check the evolution of the cancer, they can be considered as markers in time, having three distinct phases: an anticipatory period, the marker itself and a recovery phase (Saltzman, 2019). Sterponi et al. (2019) show how the temporal schemata of both physicians and patients mediate temporal structures in medical and other institutional contexts, more particularly during a consultation, "leading to the unfolding of different temporalities in the medical encounter" (Sterponi et al, 2019, p. 2020). Temporal schemata are shared between different actors during an event through a process of social influence and negotiation (Labianca et al., 2005). This is not only the case for the patient-physician relationship, but for all actors such as the informal caregiver or family members who are involved in the patient journey.

Temporal structures can be studied on two levels: either as a patterned organization of time, used by humans to help them manage, comprehend, or coordinate their use of time (Wu, 2009) or on how these patterns of time are enacted, reproduced and experienced by individuals (Pedersen and Roelsgaard, 2019). Think of the opening hours of a chemotherapy unit, which often starts working already at 7:00 AM and stops at 6:00 PM. Such a routine is one type of temporal structure. Individuals such as nurses and patients synchronize their activity and behaviors to these temporal structures (Shipp and Richardson, 2019).

So temporal structures are some sort of unwritten routines that make people entrain to rhythms of organizational activity. *Entrainment* is defined as "the adjustment of the pace or cycle of on activity to match or synchronize with that of another" (Ancona and Chong., 1996, p.251). The adaptation of the rate or cycle of an individual's behavior or activity to the temporal structures is an example of entrainment (Labianca et al. 2015; Shipp & Richardson, 2019). The organization of a hospital is interwoven with multiple temporal

structures such as an appointment system in a chemotherapy unit or in the radiology department, nurse rosters and the surgery schedule (Di Martinelly and Meskens, 2017). The extent to which a patient goes through the process of entrainment depends on how well the imposed temporal structures are compatible with its individual temporal schemata. The individual temporal schemata as cognitive frameworks that give form and meaning to the experience of the patient about time (Labianca et al.,2005) are also shaped by temporal structures from outside the hospital, such as those imposed by the employer of the patient and the informal caregiver. If a person does not adapt to these temporal structures and therefore does not go through an entrainment process, this can have an impact on the experience and even also on the well-being and health of the individual (Söderlund, 2010).

According to Shipp and Richardson. (2019), individual actors may have reasons to object against temporal structures they are confronted with whenever the individual time schemata and the temporal structures are not well-synchronized or even in conflict with each other. This new temporal structure is interpreted by the patient within a context, "generating cognitive, affective, and behavioral responses that potentially reinforce or change organizational temporal structures (as well as modify one's own temporal schemata)" (Shipp and Richardson, 2019, p.4), leading to entrainment or resistance.

Based on the previous considerations it becomes clear that an oncology patient has to share its individual temporal schemata with different other participants in the patient journey and each of these other participants can be embedded in multiple temporal structures such as scheduling systems imposed by collectives. This interplay between different individual temporal schemata of actors and multiple temporal structures imposed by collectives are not only perceived and interpreted in the present, but also from the past and future.

Methodology

Design

How patients perceive the complex interplay of temporal schemata and structures is a topic hardly been investigated. We were seeking to study this by exploring it from the perspective of those who have experienced it. Therefore, we decided to use a qualitative explorative phenomenological research design. The goal of phenomenology is to describe the meaning of experience, in terms of what was experienced as well as how it was experienced (Teharani et al, 2015). We chose the context of cancer patients who are regularly confronted with the temporal structures of their hospital, but also of their employer. Moreover, many of these patients have informal caregivers that each have individual temporal schemata while also being engaged in the temporal structures of hospital and employer. Our choice for a phenomenological approach offers a way to understand the range of factors that can affect time, from the perspective and experience of cancer patients when they are confronted with multiple temporal structures such as appointment systems.

Procedure

A purposive sample of 19 patients and 3 informal caregivers were included in the study. Participants were recruited with the help of 'Melanoompunt vzw' (an interest group of melanoma patients) and oncologists. Data collection was conducted between February

2019 and March 2020. The study employed one-on-one, semi-structured in-depth interviews using open-ended questions. The researcher encouraged in-depth exploration of issues raised by the interviewee. Additionally, diaries were collected from six patients. Using this method, participants had the opportunity to share their experiences of the events without being orientated to specific events in the patient journey.

Data analysis

One author read entirely through the transcripts to get an overall impression of the participants' views and experiences. Then she coded each interview inductively, using line by line open coding. Every transcript was analyzed in its entirety, only starting with the next when the previous was fully analyzed. Following, the coded parts of the interviews were simultaneously read by the two co-authors. They compared the inductive codes with existing theoretical time concepts. The authors had regular meetings in which they discussed the coding and to identify patterns within the data. In every discussion, the authors searched for interpretations grounded within participants' individual accounts, albeit looking for interactional patterns to get a better theoretical understanding. This helped the authors to understand the construction of the interrelationships.

Ethical considerations

The study was approved by the ethics committee of the Ghent University hospital. All participants were informed orally and in writing via informed consent. Anonymity and confidentiality were assured throughout the research process.

Results

The interviews with and the diaries of the patients teach that multiple temporal structures from within but also outside the hospital do have an impact on the experience of patients. This also depends on the individual temporal schemata of the participants which are different in terms of cancer diagnosis, number of years in therapy and employment status (see an overview of the demographics of the participants in table 1).

Table 1: Demographics of participants

Participant	Diagnosis	Gender	Age	Diagnosis time	Employment status
1	Melanoma	Female	*50+*	>4 year	Work
2	Melanoma	Female	*60+*		At home unable to work
3	Melanoma	Female	*40+*	3 year	At home unable to work
4	Melanoma	Male	*50+*	14 year	At home unable to work
5	Melanoma	Female	*50+*	2 year	Work
6	Melanoma	Female	20+	5 year	Work
7	Melanoma	Make	40+	5.5 year	Work
8	Melanoma	Female	60+	4 year	retired
9	Melanoma	Female	40+	3 year	Work/ self employed
10	Melanoma	Male	20+	A few years	Work/ self employed
11[1]	Melanoma	Female	60+	4 year	

[1] + Informal caregiver, husband, age 60+, retired

12[2]	Melanoma	Female	40+	1 year	
13[3]	Melanoma	Female	30+	8 years	At home, unable to work
14	Breastcancer	Female	70+	<1 year	Retired
15	Breastcancer	Female	70+	<1 year	Retired
16	Breastcancer	Female	40+	<1 year	Work
17	Breastcancer	Female	60+	<1 year	Retired
18	Breastcancer	Female	50+	<1 year	Work/ self-employed
19	Breastcancer	Female	80+	<1 year	Retired

Objective versus subjective time

As a start, it is relevant to mention that our analyses discerned objective time and subjective time perspectives from the patients:

"the surgery was planned at 12 o'clock, but then suddenly it was postponed by 30 minutes" (patient – diary) – objective

"The day we get the scan results is always very stressful and the waiting times can then quickly feel miserably long" (patient - interview) – subjective

The empirical results further show how time plays an important role in the experience of oncology patient during their patient journey. It all starts with the diagnosis of cancer which is a traumatic marker in time and which changes the temporal schemata of the patients.

"I used to work a lot, I liked going out, I loved shopping, now it's: 'Why do I need that?, A beautiful blouse for lying here in my bed? Before, I didn't think about it, I just did it. You also learn to enjoy very small silly things, things you used to have no time to enjoy" (patient – interview).

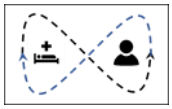
During their journey, patients are confronted with various events with a repetitive and inevitable character, such as the periodical visits to the oncology daycare unit for a therapy and the radiology department for a CT-scan. Many of these events are time-driven. This implies that duration, pace and timeliness are important elements in the experience of the patient.

"I was very happy that I finally know the what & how [referring to diagnosis and treatment]*: the only thing they can't do to me is to make me wait a long time for the result after the scan...I hope I will know something on Friday, I will insist!"* (patient – diary)

"And, that scan meeting [referring to appointment where physician discusses results of scans]*…, that's always hell* [referring to waiting time] *before you go to your oncologist."* (patient – interview).

Interplay between individual temporal schemata and temporal structures

We find evidence that the interplay of the individual time schemata of a patient and an informal caregiver, and of the temporal structures of multiple organizations in which they are involved encompasses a complex network of intersubjective time relationships. Figure 1 illustrates this interplay between the individual schemata of patients, their informal caregivers and the temporal structures of the hospitals and/or employer.



*Interplay of the patients' and informal caregivers' individual schemata and the **hospital** temporal structures*

Patients collide against the hospitals' temporal structures whenever these conflict with their individual temporal schemata. The study shows that some patients adapt, entrain to the prevailing temporal structure (e.g., accept the appointment although it does not fit in

[2] + Informal caregiver, husband, age 50+, works

[3] + Informal caregiver, mother, age 60+, retired

the agenda of the informal caregivers), whereas others resist. According to patients, the physicians' availability is leading in scheduling appointments.
"This is arranged [make new appointment] *at the reception desk and depends on the agenda of those services* [availability CT scans, agenda physician, …]*."* (patient – interview)
"That also took me 10 minutes [negotiating new appointment]*, because I wanted to come on other dates than originally planned."* (patient – interview)

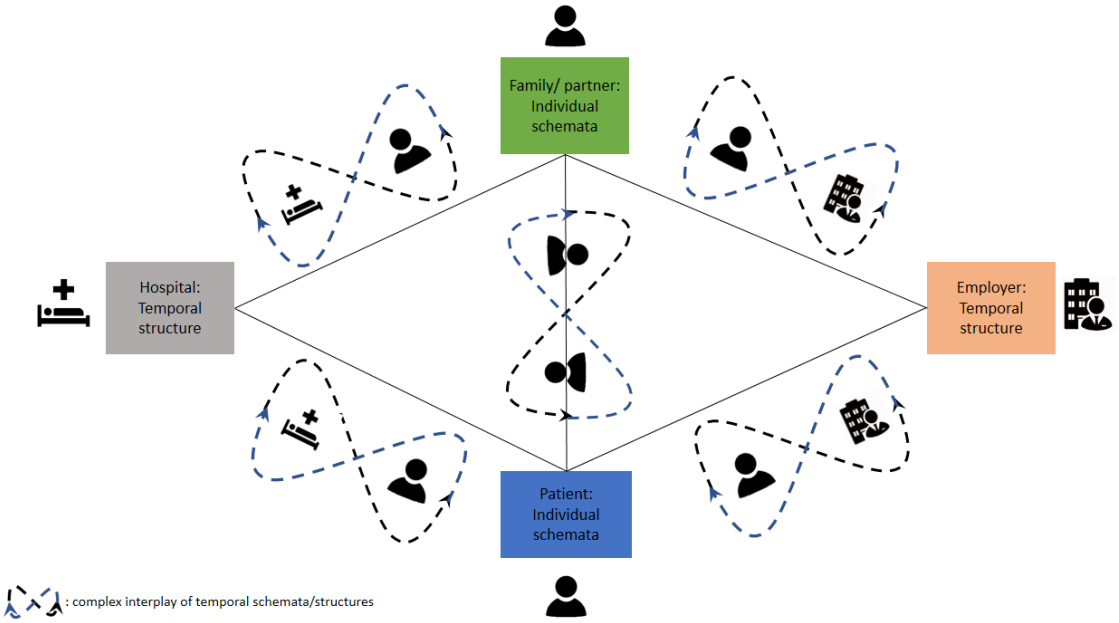
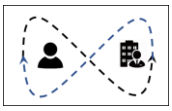


Figure 1: Network of intersubjective time relationships

Also the way in which follow-up appointments are scheduled is criticized.
"In my opinion, it would be better if the medical secretary would wait until the patient has returned from the physician's appointment, and then discussed with you [the patient] *when the new appointments should be scheduled. Now these appointments are usually already made when you arrive at the secretariat and you have to agree to them".* (patient – interview)
As a result, consultations may well take place at inconvenient or unpractical moments in time.
"Early appointment, getting up early, I am not a morning person". [patient - interview]
"I would like to arrive a bit earlier, maybe I should ask to postpone my consultation to a later hour, after the morning rush hour. Because I lose time with this [morning traffic] *or I should look for a way to leave before the rush hour."* (patient – interview)

The informal caregivers also run into the temporal structures of the hospital
"My husband took me to the hospital and then drove to his work. I always went to the hospital on my own" (patient - interview)
"In the morning I brought her [wife] *to the hospital, which was close to my work. I could easily go up and down from work and make sure that I was back in the hospital in the afternoon to pick her up"* (husband - interview).

The different individual schemata of patient and their informal caregiver or family can also evoke resistance against the hospital's temporal structures.
"Then I could go the day after [new appointment CT -scan]*, but I had to go to my father, then I only got an appointment after 3 weeks or so...."* (patient – interview)
"I really had something to do that day, a family day.... If you [patient] *don't accept that* [the appointment] *, it will be 2 weeks later."* (patient – interview)



*Interplay of the patients' and informal caregivers' individual schemata and the **employer** temporal structures*

The individual temporal schemata of patient and informal caregiver are determined by multiple temporal structures from within but also outside the hospital. In addition to the hospital's temporal structures, patients (or informal caregivers, respectively) are also confronted with the temporal structures of their job. Sometimes appointments in the hospital are planned at time slots that are difficult to align with job obligations of patient or informal caregiver. The medical secretary schedules without being aware of some patient's working days.

"Appointments are usually made when you arrive at the secretariat, and then you just have to agree to it. While in my case it is interesting that I can come on the days I am not working" (patient – interview).

Patients feel urged to object against the proposed date and time.

"I moved it [appointment] *anyway because I really wanted to work"* (patient – interview).

Other patients comply with the hospital appointment by taking a day-off.

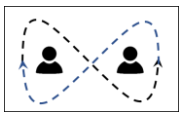
"The only thing that worries me sometimes are my days off at work…They [secretary at the hospital] *plan it* [new appointments] *exactly as if it always fits me… like it doesn't matter to you* [patient referring to herself] *when you go under the scan or something. You have to go under the scan every two or three months and if that is always at times when you want to work… You always have to say to your boss: 'I'm not coming again'. And actually I do want to go to work, I already can go so little.* (patient – interview).

As most of the informal caregivers are in employment during the patient journey they are also confronted with the temporal structure imposed by their employer. So synchronization of the temporal structures of hospital and employer is sometimes a challenge not only for the patient but also for the informal caregiver.

"For example, I stopped working and so on, and well, um, I sort of took over [housekeeping] *so that she* [patient] *could rest more. A lot of people came to see her, so she could rest a bit and then I took over the household tasks. So I took time off* [at work] *to take care of my wife."*(patient – interview).

"Of course, you always had to take time off [at work] *to come with me* [relating to spouse]*"* (patient - interview).

"...multi-million dollar construction project underway [at work]. *She* [referring to patient] *expected me to be unconditional and always available, and I couldn't do that"* (family/ husband - interview).



Interplay of the patients' and informal caregivers' individual schemata

Most oncology patients are accompanied by an informal caregiver or family member. These actors have their own individual temporal schemata. Patients and informal caregivers or family members share their temporal schemata through a process of social influence and negotiation.

"I felt like everyone was pulling at me" (husband - interview).

"all of a sudden I get a phone call and she [daughter-patient] *asks me to come over. If she'd told me before, I'd agree. But, my father is in a residential care center and on Saturday afternoon I visit him"* (family-mother).

Discussion

According to Shipp and Richardson (2019), individual actors may have reasons to object against temporal structures they are confronted with whenever the individual time schemata and the temporal structures are not well-synchronized or even in conflict with each other. For instance, when an informal caregiver who is still employed accompanies the patient to the hospital, the working hours can be in conflict with the opening hours of the chemotherapy unit. Due to this conflict, the informal caregiver cannot further accompany the patient after drop-off at the hospital entrance. This can negatively affect patient experience if (s)he appreciates the presence of the informal caregiver during the hospital visit. Some patients will still adapt to the temporal structure (entrainment), while other patients will ask for a change in the appointment time (resist). This depends on personal characteristics as well as contextual elements (traffic jams during rush hour). It would be interesting to gain better insight into these factors since they influence people's behaviors in certain situations when confronted with temporal structures.

For hospitals, an important managerial implication is that designing temporal structures such as appointment systems goes beyond the optimization of the internal processes in hospitals. One must also consider the fact that patients and informal caregivers are embedded in a complex network of temporal structures inside and outside the hospital, which could also have an impact on their experience. This is even more important in the context of experience-based design, which is increasingly emphasized in the context of a patient journey and how this should be operationally organized (Lillrank, 2012). Further research should clarify how this affects cancer patients in their social network, or how other categories of chronically ill patients confronted with multiple temporal structures have similar experiences. Besides, other service settings such as, public services that typically exhibit a substantial quantity of temporal structures (e. g. Mondschein and Weintraub, 2003) might also face similar issues.

We contend that how a customer interprets individual time cues is not only dependent on temporal structures of the organizations in which (s)he is involved, but also on the interaction of the temporal schemata of the customer with schemata of other individuals in their network. The design of temporal structures, such as appointment systems which are frequently used in service operations, should be based on better understanding of the network of intersubjective time relationships in which a customer is embedded.

Conclusion

We find evidence that the interplay of the individual time schemata of a patient and an informal caregiver, and of the temporal structures of multiple organizations in which they are involved encompasses a complex network of intersubjective time relationships. Figure 1 illustrates how patients and informal caregivers experience the temporal cues in this network. The study also shows that some patients adapt or entrain to the temporal structure (e.g., accept the appointment although it does not fit in the agenda of the informal caregivers), whereas others resist.

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