Beyond Flow: Temporality and Participation in Everyday Activities

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KEY WORDS
- activities of daily living
- human activities
- occupations
- time perception

Experience sampling examined how temporality, the lived experience of time, varied related to specific activity qualities and experiences in everyday life. Thirty-five students completed electronic surveys regarding their current activity and feelings and rated the activity’s novelty and complexity, their depth of emotional and intellectual engagement, the direction and depth of attention, and the demands of the activity on their skills. Using configural frequency analysis and an analysis of narrative responses, configurations of factors (types) associated with variations in perceived temporaliies were described. Four composite types identified occurred with any temporality. In most habitual activities, time was perceived as passing the same as clock time. Most faster or timeless temporalities occurred in complex, novel, and skill-requiring activities that engaged participants. Unexpected activity configurations were also associated with accelerated perceptions of time. Occupational therapists may use this knowledge to assist clients to redesign activities that promote positive experiences without high activity demands.


Occupational therapists analyze and alter the qualities of the activities in designing therapeutic interventions and redesigning satisfying lifestyles in collaboration with clients. Occupational therapists work with clients to grade activity demands. Ideally, clients experience sufficient but not excessive challenge during therapeutic intervention promoting positive engagement in activity. Csikszentmihalyi’s (1990) work suggests that activities that are well matched to a person’s abilities can provide a sense of flow. Flow is described as a specific set of activity qualities (challenging activity–high skill use match) and a temporality (timeless) related to this experience. This work resonated with therapists because it articulates the “just-right” challenge of occupation for which occupational therapists strive (Rebeiro & Polgar, 1999). Designing interventions that foster optimal positive experience is a therapeutic ideal.

Research suggests one’s sense of time during activities may be a key indicator of emotional experience during participation. When time passes quickly, activities are often viewed as pleasant (Gupta & Cummings, 1986). Conversely, a sense of time scarcity, or insufficient time for an activity, has been associated with increased stress and poorer physical and mental health (Lehote, 1998; Zuzanek & Mannell, 1998). Exceptions have been noted, however; for example, although flow is accompanied by a loss of time sense, it is not necessarily associated with positive mood (Haworth & Evans, 1995). As social concerns rise regarding time perceptions and health, for instance, how time pressure and scarcity may be eroding quality of life, it is important to better understand temporality related to participation in everyday activities.

There are many other combinations, beyond flow, that are present in clients’ everyday lives. Massimini and Carli (1988) proposed eight different challenge–ability matches or “channels,” which they named with related theorized experiences.
For example, boredom was described as a low challenge–high skill match or relaxation as a low challenge–moderate skill match. Speed of time’s passing was investigated for their eight channels. In addition to flow, in the arousal (high challenge and moderate skill) and anxiety (high challenge and low skill) channels, time was perceived to move quickly. No other alterations in temporality were noted in any of the other challenge–ability matches. Little is known about how temporality is experienced during participation in very common, but less challenging, habitual or otherwise nonflow configuration activities. It is important to understand qualities of the range of daily activities, as well as optimal experience to orchestrate meaningful occupations for clients.

Drawn from theory and a review of research, the Dynamic Occupation in Time model (DoIT; Larson, 2004; Larson & von Eye, 2006) proposes a continuum of activity and skill dimensions related to time’s passing and subjective experiences. The DoIT model suggests dynamics of participation that can assist occupational therapists in selecting therapeutic activities for clients and suggesting strategies to shift participation to more positive experiences (see Figure 1). It suggests that a person’s skill in performing an activity task alters the perception of the task complexity and time in passing. Learning may alter whether attention and action during an activity are automatic or effortful. With the exception of experience sampling research (i.e., Conti, 2001; Csikszentmihalyi & Csikszentmihalyi, 1988), research has not examined how the person’s skills and ability to participate in the activity relates to temporality. As noted earlier, only in high-challenge situations, with any level of skill, was time perceived to move quickly (Massimini & Carli, 1988).

Briefly, DoIT proposes that a person participating in an activity may operate in a routine manner or a highly generative manner depending on the person’s interest and the specific activity features that challenge or fail to challenge their skill in performing the activity (Larson, 2004; Larson & von Eye, 2006). Either intensive emotional or intensive intellectual involvement in the activity is theorized to facilitate deeper attentional focus and thus more engagement in an activity. Thus, strategies like mindfulness could enhance or promote deepening engagement when desired. In addition, sufficient but not excessive challenges to the individual skills are believed to further reinforce engagement. This process, in turn, leads to differing temporal experiences, which may shift as the person lessens or deepens his or her engagement or as the activity becomes more or less challenging. The deeper the engagement in the activity and the greater the demand for skill, within certain ability parameters, the greater the speed of time in passing is proposed to be. However at the highest levels of demand, a performance decrement is believed to occur in tandem with a slowing of time when the challenges of the task exceed the person’s abilities. Finally, the resulting experiences may vary in the subjective experience, sense of achievement, and experience of performance. This last part of the model lacks sufficient detail and needs further research to elucidate the subjective experiences related to variations in activity configurations and temporality.

A previous structural modeling of the data presented in this article supported an interaction of engagement features (e.g., emotional engagement, intellectual engagement, focus on self, focus on activity), activity participation features (e.g., novelty, skill, complexity), and temporality. Specifically, activity features significantly predicted engagement, which in turn predicted temporality. In addition, the greater the engagement was, the faster time was perceived to pass. Thus the progressive deepening of engagement during the activity—being drawn into an activity—increased the speed of time in passing. This prior analysis supports an overall tenet of the dynamic interactions described in the DoIT model. It does not provide the detail about specific activities and experiences that are necessary for this knowledge to be applied to practice.

Understanding the range of common activity configuration features could aid occupational therapists in designing interventions that promote well-being and, by further extension, positive lifestyles. For example, this may be one tack to understanding and promoting occupational balance (Christiansen, 1996). By examining how much of daily experience is spent in activities where time flies, drags, or moves in synchrony with the clock for people with high self-perceived well-being, we may learn more about occupational balance. It is likely that everyone needs some “down time” without activity challenge; some challenging, flow-producing activities; and some time immersed in the perfunctory dailyness of completing simple everyday tasks. Before the overall organization of these daily activity patterns can be examined, research is needed to identify how shifts in temporality are related to variations in sets of activity qualities and engagement, specifically, whether there are common activity configurations and experiences related to certain occupations. The following review examines core issues in studying temporality and each of key features of the DoIT model (e.g., novelty, complexity, attentional focus, skill use).

Complexity of Researching Temporality

Understanding temporality, the relationship of lived experience to clock time (McGrath & Kelly, 1986), is no easy task. This may be why it has not been systematically and persistently studied, as is obvious in the literature on temporality.
Figure 1. Dynamic Occupation in Time Model (DOiT).

Early on, James (1890/1950) described a core and problematic enigma: In general, a time filled with varied and interesting experiences seems short in passing but long as we look back. Conversely, a tract of time empty of experiences seems long in passing but in retrospect short (James 1890/1950, p. 624). To simplify, this study focuses on the experience of time perception during activity, avoiding the prospective versus retrospective debate.

Because of its complexity, temporality research has been conducted in lab settings to control for multiple variables. These studies identified single variables or specific circumstances when time sense appeared to increase or contract. However, their procedures failed to attend to the complex influences on perceptions of temporality in daily life and lack ecological validity (Glicksohn, 1996). However, these studies do supply foundational variables to consider in everyday contexts. Of specific interest here are activity factors such as novelty, complexity, depth of engagement, attentional focus, and skill requirement. These activity features considered in the DoIT model are commonly considered by clinicians when grading therapeutic activity.

Novelty and Complexity

Research provides evidence, albeit contradictory, as to how novelty alters perceived duration. Initially novel or new tasks made equivalent time periods appear longer to participants (Harton, 1938). Yet, the opposite was also noted, in which a novel first activity was estimated to be shorter than succeeding activities (Loehlin, 1959; Postman, 1944). In addition, strategies that enhanced novelty such as irregular presentation of stimuli or addition of a second task, both led to a perception that time passed more quickly (Hawkes & Sherman, 1972; Macar, 1996). Novelty may initially create a different processing load, leading to a perception that time passed quickly; however, in very difficult tasks, this might not be true. In the instance of high challenge, novelty may make time appear to drag when the task overwhelms the person.

To better understand the intricate literature on complexity and temporality, information-processing load created by both task difficulty and stimulus quantity must be considered. Some researchers have tried to separate complexity and difficulty, arguing that one is a perceptual process, whereas the other is cognitive processing (Angrilli, Cherubini, Pavese, & Manfredinini, 1997). This study takes the perspective that activity complexity encompasses and requires perceptual processing of stimuli and therefore cannot be considered separately from it.

Two different theories have been proposed that appear to apply only to the activities in the middle of the complexity spectrum: (1) the greater the number and complexity of stimuli are, the greater the perceived duration is (Zakay, 1992) or (2) more complex tasks demand attention to the task rather than time, so perceived duration is shorter (Thomas & Weaver, 1975). In other words, the more stimuli fill memory, the more time seems to have passed. In the second theory, the more attention is demanded by the activity, the less focus we have on time. Therefore, less time seems to have passed. In a series of studies, increased difficulty led to time estimates less than the actual clock time elapsed or time sped along (Block, 1992; Zakay, Nirzian, & Glicksohn, 1983). Perceived time was shown to be an inverse function of amount of information processed (Curton & Lordahl, 1974; Hicks, Miller, Gaes, & Bierman, 1977; Michon, 1965; Ornstein, 1969; Vroon, 1970). Similarly, intervals where greater numbers of stimuli were processed or deeper processing was required were perceived as shorter (Arlin, 1986; Block, 1974; Ornstein, 1969; Predebon, 1996; Underwood & Swain, 1973). This parallels conditions of flow where a sense of timelessness or foreshortening of time occurs during a just-right level of task difficulty (Csikszentmihalyi & Csikszentmihalyi, 1988). The more extreme ends of the complexity continuum, very difficult—moderately challenging activities or low complexity, do not adhere to the proposed inverse linear relationship between complexity and perceived duration. In several, increasing the number of stimuli led to increased duration estimates closer to objective time or of longer durations (Macar, 1996; McClain, 1983). At some point, task complexity may tax the participant’s ability, leading to a perception that time is longer. At the opposite extreme, passively watching or unfilled intervals also led to overestimates of time (Hicks & Brundidge, 1974; Thomas & Weaver, 1975). This is may be similar to boredom in which when time is unfilled, it seems to drag. A U-shaped relationship between levels of complexity and perception of time has been hypothesized (Flaherty, 1999; Glicksohn, 2001).

Engagement

Complexity is arguably generated only when the person actively participates in an activity. Being passively present for a difficult task rather than actively engaged may lead to longer perceived durations similar to unfilled intervals (McClain, 1983). Flaherty (1993) proposed that certain activities evoke either an emotional response or an intellectual interest, or both, creating what is termed here as engagement. Depth of engagement is highly dependent on the activity, context, and person’s interests and abilities. For example, a novel activity may evoke interest in one person who feels challenged by the task and fear in another who finds the activity beyond his or her ability. Engagement is highly dependent on the person’s life experiences and skill set.
Although emotional or intellectual engagement per se has not been studied, concepts parallel to these such as the influence of emotion, arousal, or interest have been examined. For example, both negative emotional circumstances and positive expectancies have been shown to significantly increase time estimates (Angrilli et al., 1997; Edmonds, Cahoon, & Bridges, 1981; Flaherty, 1987; Lofrus, Schooler, Boone, & Kline, 1987). It has been suggested that alterations in emotion underlie these changes in temporality, potentially by increased physiologic arousal (Curton & Lordhal, 1974; Fox, Bradbury, & Hampton, 1967; Gupta & Cummings, 1986). It does appear that tasks that pass quickly are perceived as more pleasant (Gupta & Cummings, 1986). There may be a reciprocal loop between participation and emotion that influences perceived duration. With regard to interest, cognitively more active people underestimate time (Chebat, Gelinas-Chebat, Vaninski, & Filiatrault, 1995), as do those who are highly intrinsically motivated (Conti, 2001). Absorbed involvement, whether emotional or cognitive, seems to alter perceived duration because of a hypothetical shortening of the subjective time unit or time flying (Glicksohn, 2001).

**Attentional Focus**

Focusing attention to tune in the foreground and tune out the background of stimuli is essential to skilled participation in an activity (Easterbrook, 1959; Michon, 1965). The direction of attention, inward toward the self or outward toward the external environment, may vary depending on emotional or intellectual considerations. For example, the self-conscious beginner may be less likely to feel time flowing quickly when attending to how well he or she is doing. Therefore, the direction of attention outward versus inward may lead to greater absorption in the task and foreshortening of time. Attention to task prolonged perceived durations (Mates & Ulrich, 1998) and led to underestimates of duration (Curton & Lordhal, 1974; Thomas & Weaver, 1975; Zakay, 1992, 1993). These conflicting findings may again be explained by considering the continuum of attention. Very high or very low levels of attention may be required depending on the information-processing load.

**Skill**

People’s subjective interpretation of the demands of their skill use in an activity have been described as key to perceived temporality (Flaherty, 1999; Frankenhauser, 1959; Woodrow, 1951). In this interpretive process, the match of the person’s skills and task demands are considered. Strain experienced or differences in expected complexity within a given time period may be used as indexes of increased demand. People may compare whether the current circumstance matches their typical “density of experience” (Flaherty, 1999, p. 15). Variations from typical demands related to complex activities are experienced as more challenging to one’s skills and thereby alter temporality.

As this review demonstrates, aspects of the subjectivity of temporality have been investigated, but rarely has temporality been studied as a group of interacting factors because they commonly occur in everyday activities. Based on this literature and the proposed theoretical model, this study will explore configurations of activity factors related to time in passing and subjective experience during everyday activities for a group of young adults. Specifically, groupings of features including novelty, complexity, the intensity and direction of attention (toward self or the activity), the intellectual and emotional engagement in the activity, and reliance on current skills or generation of new skills will be examined as they relate to slow, synchronous, fast, and timeless temporalities.

**Method**

This study presents findings from a study of temporality and participation in activity. A previous report described a structural modeling analysis of these data, as noted earlier, providing preliminary support for the overall dynamics of the DOI model (Larson & von Eye, 2006). To recap, temporality was predicted from an activity factor (novelty, skill, and complexity) and a participation factor of depth of engagement (emotional and intellectual engagement, focus on self and focus on activity). Path coefficients suggested that activity features in combination with the person’s skill use significantly predicted the engagement factor, which in turn predicted temporality. A two-way path between temporality and engagement was interpreted as supporting that increased engagement led to perceptions of time increasing in speed, which then increased engagement. The current report analyzes the specific variations in multiple temporalities related to various configurations of activity novelty and complexity, the intensity and direction (toward self or the activity) of the attentional focus, the intellectual or emotional engagement in the activity, and the reliance on current skills or generation of new skills.

**Participants and Procedures**

Participants were volunteers from two occupational therapy programs in the midwest and western U.S. universities, ages 18 to 34 years (mean = 23.8 years). Most students were female ($n = 34$ female; $n = 1$ male) and White ($n = 29$ White; $n = 6$ Asian). Data were collected in 4-day cycles (3 collection
days and 1 rest day). Participants were paged by means of Motorola pagers 10 times daily (randomly within 1.5-hr blocks between 7:00 a.m. and 11:00 p.m.), completing three waves of data for a total of 2,740 surveys. Because occupations were sampled across a typical day, conditions such as fatigue or tiredness may have influenced participants’ responses. Each student was paged 140 times and on average completed 78 surveys (response rate of 55.7%). This is more surveys collected on average per participant than the maximum of 70 total surveys other experience sampling method studies have attempted to collect (Barges-Schaapveld, Nicolson, van der Hoop, & De Vries, 1995; Conti, 2001; Klumb & Bales, 1999). Because the individual activity and its qualities was the unit of analysis, rather than differences between people, this response rate was considered acceptable.

After each page, participants responded to questions with brief statements, rated activity features on Likert scales anchored by extreme adjectives (see Larson & von Eye, 2006), and returned the completed survey by means of e-mail. The two questions used for this analysis were as follows: “Just before you were paged, describe the main thing you were doing” or “How did you feel right before you were paged?” The second question was intended to generate feeling descriptions that combined with activity factors may also alter temporality. Activity rating scales were based on the DOIT model and included the following eight variables: participants’ rating of activity novelty, complexity of the activity, their emotional engagement in the task, their intellectual engagement in the task, the intensity of their focus on the activity, their focus on themselves during the activity, the reliance on current skill or innovative actions, and their rating of how time passed relative to clock time.

Methods of Analysis

The eight variables were subjected to a configural frequency analysis (CFA; Lienert & Krauth, 1975; von Eye, 2002; von Eye, Spiel, & Wood, 1996). The CFA identified significant clusters or groupings of the activity variables. We termed these groupings of factors as occupational types. CFA was used to identify occupational types by examining the patterns of the eight variables that co-occurred more often than expected based on chance. In addition, to further understand occupational configurations, this analysis used the narrative descriptions of the kinds of occupations and feelings described during these types of behaviors (see Larson, 2006, for a description of the recoding and collapsing of narrative data). This allowed for the explication of the resulting subjective experiences associated with these occupational configuration types.

The activity variables were used in dichotomous form, with 1 indicating low and 2 indicating high. Temporality was scaled at the nominal scale level (1 = slower than clock time, 2 = same as clock time, 3 = faster than clock time, and 4 = lost track of time). Crossed, the eight variables form a $2 \times 2 \times 2 \times 2 \times 2$ contingency table with 512 cells. The CFA model used for analysis was a first-order global model, that is, a model that proposes that the variables under study have only main effects but are not related to each other. Types can occur only if variable associations exist. The comparisons of the observed with the expected cell frequencies were performed using the Anscombe z approximation (see Upton, 1978; von Eye, 2002). The experiment-wise $\alpha$ was protected using Bonferroni’s procedure, which resulted in the adjusted significance threshold $\alpha^* = 0.0000977$. Configurations, patterns of the eight variables under study, constitute types if the null hypothesis of no difference between observed and expected cell frequencies can be rejected at the adjusted level $\alpha^*$. Types reported here were significant at $\alpha^* = 0.0000977$. Table 1 illustrates the participants’ ratings (high = 2 or low = 1) of the eight variable configurations and a frequency of the configuration. Numbers in the first row indicate the types.

Results

As suggested by the DOIT model, of the faster-than-the-clock or “lost track of time” occupational types (15), a total of 10 occurred in high-complexity, high-novelty, and high-skill demanding activities. This was expected given the structural modeling of these data. However, perception of time in passing in some cases ranged from slow to fast across a spectrum of activities or the same configuration of factors. For example, some activities low in complexity and novelty that required little engagement, attention, or skill also produced accelerations in time.

Thirty-one types emerged from the CFA describing 1,034 of the 2,740 surveys. Of these 31 types, four composite occupational types were noted (von Eye, Lienert, & Wertheimer, 1991). Composite occupational types are a set of occupational types that are rated similarly on all variables except for one variable, in this case temporality. The composite occupational types that emerged here are interesting because despite the similar activity ratings, time-in-passing ratings varied. In these instances, time “shifted” from slow to timeless despite similar skill, engagement, and activity demands. The additional narrative data (feelings and occupation categories) assisted in understanding what underlies these shifts. The following describes the composite and single types as they range from the low- to the high-rated configurations.

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1This table can be requested from Elizabeth Larson (blarson@education.wisc.edu) or Alexander von Eye (voneye@msu.edu).
### Table 1. Configurations of Novelty, Emotional Engagement, Intellectual Engagement, Focus on Activity, Focus on Self, Complexity, Skill, and Temporality in Occupational Types

| TYPE   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
|--------|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| CONFIGURATION |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| NOVELTY | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| EMOTION | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| INTELLECT | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| FOCUS | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| SELF | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| COMPLEXITY | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| SKILL-USE | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L | L |
| TEMPORALITY | SLOW | SAME | FASTER | SLOW | SAME | SLOW | SAME | FASTER | SLOW | SAME | FASTER | SLOW | SAME | FASTER | SLOW | SAME | FASTER | SLOW | SAME | FASTER | SLOW | SAME | FASTER | SLOW | SAME | FASTER | SLOW | SAME | FASTER |
| FREQUENCY | 31 | 80 | 38 | 27 | 13 | 29 | 26 | 62 | 39 | 13 | 45 | 24 | 12 | 27 | 16 | 25 | 14 | 29 | 17 | 26 | 19 | 14 | 20 | 50 | 44 | 38 | 31 | 22 | 41 | 80 | 82 |
| COMPOSITE TYPES | Comp Type 1 | Comp Type 2 | Comp Type 3 | Comp Type 4 |

Configuration Key
Activity descriptors: H = rated high (= 2 in configurations); L = rated low (= 1 in configurations)

### Table 2. Common Occupations and Experiences in Composite Occupational Types

<table>
<thead>
<tr>
<th>Composite Type</th>
<th>Activity Configuration*</th>
<th>Most Frequent Occupations</th>
<th>Common Experiential Qualities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 novelty</td>
<td>Slow: watching TV, walking, eating, attending class, doing chores, driving</td>
<td>Slow: bored/tired, rushed, stressed, uncomfortable</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Same as clock: driving, eating, watching TV, sleeping, doing self-care, doing chores, walking</td>
<td>Same as clock: bored, relaxed and content, neutral</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Faster than clock: sleeping, eating</td>
<td>Faster than clock: relaxed, sleepy, happy, uncomfortable, bored</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lost track: sleeping, walking</td>
<td>Lost track: sleepy, content, happy, rushed</td>
<td></td>
</tr>
<tr>
<td>2 novelty</td>
<td>Slow: attending class, working, riding in a vehicle, doing self-care, other</td>
<td>Slow: bored, bodily discomfort</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Same as clock: self-care (45%), eating, walking, doing chores, waiting</td>
<td>Same as clock: tired/sleepy, okay, calm, good, bored, rushed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Faster than clock: doing self-care (mainly showering), eating, doing chores, sleeping, walking, watching TV</td>
<td>Faster than clock: tired, hungry, anxious, rushed, relaxed, good</td>
<td></td>
</tr>
<tr>
<td>3 novelty</td>
<td>Slow: attending class, studying, writing</td>
<td>Slow: thinking, frustrated, anxious</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Same as clock: working, attending class, studying, talking</td>
<td>Same as clock: happy, interested, worried</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Faster than clock: working, studying, attending class, driving/riding, writing, watching TV, talking, reading</td>
<td>Faster than clock: interested, excited</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lost track: talking, working, writing, attending class, studying, cooking, taking exam, playing</td>
<td>Lost track: happy, anxious</td>
<td></td>
</tr>
<tr>
<td>4 novelty</td>
<td>Slow: working, studying, talking, attending meeting</td>
<td>Slow: anxious, overwhelmed, stressed, frustrated</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Same as clock: talking, working, attending class, studying, watching sports/video</td>
<td>Same as clock: happy, stressed, calm, frustrated, productive, confused</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Faster than clock: talking, working, studying, reading, writing, attending class</td>
<td>Faster than clock: good/okay, happy, engaged, excited, relaxed, rushed</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lost track: talking, writing, working, studying, teaching, playing, attending performance/meeting</td>
<td>Lost track: happy, focused, excited, productive, stressed, anxious</td>
<td></td>
</tr>
</tbody>
</table>

*Bold text indicates items that were rated high.*
Table 2 provides the reader with a description of each of the composite occupational types including its activity configuration, the most frequent occupations occurring in the composite occupational type and its common experiential qualities.

Habitual Occupations

In this first composite occupational type of habitual or familiar activities (Types 1–4; calculated using Stouffer z test; \( z = 28.61, p < .01 \)), time typically passed the same as the clock. However, when students’ experiences were aligned with the activity, that is, feeling tired or relaxed during sleep, time was perceived as passing quickly. These activities were rated low in novelty, complexity, emotional or intellectual engagement, focus on self or the activity, and skill. Students were typically driving, performing self-care or chores, watching TV, or eating.

Although this occupational pattern included all categories of temporality, experiential differences were revealed in narrative answers. When time passed slowly in the first type (Type 1) of this composite occupational type, students most often appeared bored or tired (58%) or rushed, stressed, or uncomfortable (29%) engaging in these activities (attending class, chores, driving, eating, sleeping, waiting, walking, and watching TV; 6%–13% each). In Type 2, the most frequent, students were doing similar activities yet felt more neutral (bored, 29%; relaxed and content, 22%; neutral, 18%). A shift to time passing quickly in the third type was likely related to the most common activity, sleeping (45%), where time flying was desirable and student experience matched activity demands (relaxed, 34%; sleepy, 26%; happy, 13%; uncomfortable, 13%; bored, 3%). Similarly, in the last type (Type 4), losing track of time, there was a match of the activity and the desired experience. The major activities in this type were sleeping (55.5%), walking (11.1%), doing self-care, and doing chores (7.4% each), and the majority of students felt sleepy (48.1%), content (22.2%), or happy (14.8%), with a few feeling rushed (11.1%). Experiential–occupational matching in the last two types of this composite occupational type was associated with perceptions of increased speed.

Skill-REquiring Habitual Occupations

In the next two single types of skill-requiring but otherwise low-demand activities, Types 5 and 6, the feelings of fatigue or anxiety differentiated whether time dragged or was the same as the clock. There were low scores on every variable except skill. Activities for the first type included the following: chores (23.4%), doing child care, reading, riding in a car (15.4% each), or doing self-care, waiting, class, or driving (7.7% each). For the second type, they included the following: eating (21.7%), walking or doing miscellaneous activities (17.2%), e-mailing, watching TV, doing chores (13.8% each), or doing self-care (3.4%). In the slow type, nearly half felt tired, and another quarter felt either relaxed or anxious. In the synchronous type, only 20% felt tired, whereas others felt good (31%); cold or hungry (13.8% each); indifferent (10.3%); or busy, rushed, or relaxed (6.9% each).

Self-Focused Habitual Occupation

In the second composite occupational type (Types 7–9), when the nature of the activity required paying attention to oneself, for example, when performing a self-care task, time moved faster than when attention to self was caused by boredom. Self-care activities were the most frequently mentioned in the faster and timeless temporaries (36%–45%) within this configuration. Additional activities included sleeping, eating, doing chores, walking, watching TV, and doing other tasks. The primary feeling was tiredness (20.6%) or feelings of discomfort (hunger, 10%; anxious, 10%; being rushed, 7%), although others felt relaxed (15.3%) and good (12.8%). Many of these activities were transitional ones from sleep getting ready for the day, which is reflected in the experiences students related. However, when attention to self was caused by disengagement, time moved slowly. Activities when time dragged were also experienced as boring (33%) or associated with bodily discomfort; these activities included the following: participating in class, working, riding in a vehicle, doing self-care, and doing other activities. When temporality was experienced as the same as clock time, the dominant activity was doing self-care (45%), and a range of other activities including eating, walking, doing chores, or waiting. For the most part, participants felt tired or sleepy (27%), whereas others described their experience as okay, calm, or good (29.1% combined) or alternatively bored (9.6%), rushed (12.9%), alert (3.2%), or hungry (3.2%). In this case, it is not a self-consciousness caused by difficulty but necessity that directs the focus to self and still with flow-like temporality, whereas in boredom or disengagement time drags. For the most part, activities low in novelty, emotional and intellectual engagement, focus, complexity, and skill but high on self-focus were self-care activities or those that allowed rejuvenation (sleep, walking, eating).

Emotionally Engaged Habitual Occupations

In the next single type (Type 10), time dragged in under-demand occupations where participation was deterred because of boredom or fatigue. Sample activities included participating in class, driving, parking, waiting, working, and exercise. Not surprisingly, being sleepy or tired occurred most frequently (38.5%), followed by being bored (30.8%), or cold and hungry. In this case, the high emotional engagement was negative.
Self-Focused and Emotionally Engaged Habitual Occupations

The next two types (Types 11 and 12) demonstrated that positive or “matching” experiences in simple activities that were emotionally engaging and required a focus on oneself led to time being experienced either the same as or faster than the clock. When time was perceived as passing the same as the clock, the principal activities were eating (33.4%), doing self-care (15.6%), watching TV (11%), talking (11%), trying to sleep (9%), riding in a vehicle (6.7%), or doing other tasks. Unlike previous types, participants felt happy, satisfied, content, okay, or eager (totaling 66.6%) during these activities, with fewer feeling tired (15.5%) or stressed (11%). However, when time passed quickly, participants were most likely sleeping or trying to sleep, performing self-care activities, eating, or watching TV. One-third of the time in these activities, they felt happy or, as expected when sleep was the major activity—tired (20%), relaxed (16%), or stressed (20%) as they tried to sleep.

Engaging Habitual Occupations

In Type 13, positive and often social experiences in simple yet highly engaging (high intellect, self, emotional engagement, and focus on self and the activity) activities led to losing track of time. This occurred when talking with others, eating a meal, sleeping, e-mailing, or singing. Participants mostly described highly positive experiences feeling happy (66.8%) or tired (33.3%). This appears to be a type of social “flow” where timelessness emerges because of a highly focused social participation.

Novel Habitual Occupations

By contrast, in the next type (Type 14), novelty (low rating on all other dimensions) paired with generally positive experiences during mostly solitary activities was not sufficient to speed time along. In this instance, time was perceived as synchronous with the clock during activities such as chores, eating, watching TV, talking, or riding in a car or other transportation. Participants often felt happy (26%), content (14.8%), busy (14.8%), hurried (14.8%), or tired and thirsty (7.4% each).

Unengaging Challenging Occupations

Types 15 and 16 also reinforce that activity demands alone do not lead to time accelerations, especially if the person’s capacity to engage is impeded by fatigue or other factors. Novel, complex, and skill-demanding activities that did not engage the person’s emotions or intellect or focus on the activity or self led to time being perceived as moving slowly or the same as the clock. Sample activities included doing chores, studying, attending class, copying, driving, writing, working, or talking. When time was experienced as slower than the clock, feelings included boredom (31.3%), impatience (18.8%), tiredness (18.8%), indifference (18.8%), and relaxation (6.3%). When time was synchronous, participants described feeling less negative; instead, they described feeling okay (28%), tired (24%), relaxed (16%), and alert or hungry (8% each).

Low-Skill Intellectual Occupations

By contrast, time was perceived as flying when an activity was perceived as novel, intellectually challenging, drawing the participant’s focus without involving emotions, focusing on the self, or requiring skill (Type 17). Except for the level of skill required, this is similar to a typical flow configuration. In this type, participants lost track of time during typical student activities such as studying, writing, participating in class, reading, or writing letters. The qualities of the activity led mainly to feelings of being alert, busy, intent, and content, as well as a few feeling frustrated or hurried.

Intellectually Engaging Challenging Occupations

In Types 18 and 19, the participants were intensely immersed in the activity (not emotionally engaged or focused on themselves), performing complex, novel, highly focused, and skill-demanding activities, most often studying. Other examples included attending class, doing research, paying bills, reading for pleasure, exercising, and doing taxes. In the first configuration, the dominant feeling was described as good or involved, and in the second configuration most felt focused, pleased, or productive. Time was perceived as faster or timeless in speed in this type.

Emotionally Engaging Challenging Occupations

By contrast to the intellectually engaging activities, in Type 20, time also flowed in a speedy way during novel complex skill-requiring activities that engaged students emotionally and drew their focus and self but not intellectual engagement. Again, this appeared to be a social flow type. Students were often talking with others, doing chores, exercising, attending class, or driving when they rated the activity this way. Emotions ranged from relaxed, good, and excited to anxious and tired. Predominantly positive emotions (happy, calm, creative, or engrossed) were described by 85% of the participants in this type.

Engaging Challenging Occupations

Types 22 through 25 made up the third composite occupational type. Although participants did not focus on themselves, they became both emotionally and intellectually engaged in the activity at hand. This configuration is most
like flow because in flow there is a self-transcendence caused by an absorption in the activity. Activities across all four temporalities were productive complex activities such as working, attending class, studying, and writing. In order of increasing speed, the predominant feelings reported were thinking or frustration (21%) each in the slow temporality; happy, interested, or worried (20%, 20%, and 15%, respectively) in the same as clock time; anxious or excited (28% and 26%) in faster than the clock time; or happy (42%) and anxious (20%) in the lost track of time category. It appeared that it was three times as likely for time to be perceived as faster than the clock in this composite occupational type. Students’ descriptions of their feelings during activities suggested that this increased speed of time in passing appeared to be accompanied by students more often feeling happy or excited.

Self-Focused Engaging Challenging Occupations (High and Low Skill)

The set of Types 26 and 27 and fourth composite occupational types (Types 28–31) included highly novel, complex, attention-demanding, and engaging features that varied in the level of skill demanded. The experiential shift from the slow to the faster temporalities appeared to co-occur with a shift in feelings from highly stressed (85%) in the slow temporality to feeling more positive feelings and less stressed in faster perceptions of time in passing. This suggests a capacity difference in the task in which participants’ feelings of being taxed slowed time. This taxing of capacity may account for the greater focus on the self, not evident in the third composite occupational type more similar to flow. Types 26 and 27 and fourth composite types differed only in the level of skill demanded. With no new skills required, Types 26 and 27 produced a sense that time was passing the same as clock time or faster. When new skills were required in the fourth composite occupational type, the perception of time passing faster or timelessly was 2 to 4 times as frequent as perceptions that time passed slowly or the same as clock time. This fourth composite occupational type where students appear challenged and working at the edge of their abilities was the most frequent composite occupational type. This is not surprising given the challenge to students to master new material.

In Type 26, time was perceived as the same as the clock and in Type 27 time was perceived as passing faster than clock time. Both types included activities that required thinking and problem solving such as reading, writing, talking, studying, working, e-mailing, or doing sports. The majority of students appeared to feel tension during activities in both types, most frequently describing anxiety, frustration, or stress.

The final, fourth composite occupational type is constituted by the last four configurations (Types 28–31; $z = 28.04, p < .01$). This end of the continuum, more novel and complex activities that more fully engage participants, included a wide range of activities such as working, studying, talking, writing, dancing, and others. Qualitatively, feeling stressed was the dominant feeling for the majority of students in the slow temporality, but the percentage feeling stressed diminished (85% to 12%) as time was perceived to pass more quickly. For the most part, feelings were increasingly more positive with participants feeling happy, focused, excited, and productive as the felt experience of time increased in speed toward timelessness. However, the focus on self seems to be associated with the greater stress evident in this composite occupational type. These occupations appeared to challenge the participants’ capacity beyond a comfortable margin of skill.

Discussion

As predicted by the DOrT model, most perceived accelerations of time in passing occurred in occupations rated high complexity, high novelty, and high skill demand. Yet the identification of four composite occupational types, where any temporality could be present with the same set of factors, suggests that there are additional factors or dimensions that cause shifts in perceived temporality beyond those included in the model. The shifts in temporality within composite occupational types seemed to be largely attributable to readiness and capacity to engage, having sufficient physical and mental energy, performance anxiety, and whether there is an experiential—occupational matching in participation.

These data also provided several interesting surprises with regard to instances that were not novel, complex, or challenging but still produced pleasant timelessness or accelerations of time. For example, it was interesting that a sense of time acceleration was associated with very low load activities, such as self-care and sleeping, as well as socially engaging activities. This may demonstrate the positive possibilities of flow in rejuvenative self-care tasks. Alternatively, these low load types may illustrate a factor not yet included in the model—time pressure. These occupations may reflect two opposing experiences of time pressure. In some instances of self-care, instead of a positive sense of timelessness participants may have felt there was not enough time available as they rushed through self-care to move onto other occupations. In the case of sleep, there appeared to be a matching of desired experience and occupation, losing track of time when sleeping.

In another unpredicted example of subjective acceleration of time in passing, two types were found in which high emotional engagement rather than intellectual engagement (without a demand on skills in a simple task or with skill required in a complex and novel task) was significantly more
likely to co-occur with a sense of timelessness. These may be termed social flow. This finding suggests that not only intellectual engagement but also intense emotional engagement, despite other activity demands, increased perceived speed of time in passing. The high participation in social activities in this age group may be why a social flow configuration emerged. Because participants were young adults, these findings may not apply to younger or older populations.

It is also important to note that activity demands were not sufficient to induce time acceleration or timelessness if students’ capacity or engagement flagged. Despite the novel, complex, and skill-requiring nature of some activities, time passed slowly or the same as the clock in some types when participants were disengaged and reported greater boredom, impatience, and tiredness. By contrast, with all other factors the same as the type just described, some students choose to be intellectually engaged, resulting in losing track of time. These findings support the importance of considering the person’s capacity (alertness, energy) and agency in choosing to engage in an activity.

Simply put, based on these findings, there is initial support for occupational-based strategies such as (1) monitoring clients’ flagging interest and fatigue during participation, two things that diminished positive subjective experience; (2) affirming to clients the rejuvenative benefits and positive experiences of mindful participation in self-care and other simple habitual activities; (3) encouraging participation in complex activities that are more likely to accelerate the perception of time; (4) recommending social interactions as equally rich opportunities for flow-like experiences; and (5) assisting clients in understanding that although anxiety may underlie new and challenging occupations, it can coexist with positive subjective experiences.

Although many of these findings support the DOI model, they also suggest modifications are necessary to account for these time shifts. In addition to the factors examined here, further research needs to explore the effects of age and other experiential factors such as stress, motivation, progress toward a goal, and individual personality factors to create a more comprehensive understanding of the interactions that influence perceptions of temporality. Pursuing this line of research, it may eventually be possible to examine common configurations or activity profiles that in combination in daily rounds create satisfying and healthy lifestyles.

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