Full length article

Mechanisms of interest sustainment[☆]

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ABSTRACT

Sustaining an interest leads to a wealth of positive outcomes for adolescents. Whereas previous research has often attributed interest sustainment to deliberate reasons of the individual, one may argue that processes related to the daily routines and practices might also play a role in sustainment. The present study aims to provide a detailed and differentiated account of interest sustainment, which may shed light on how interest may be sustained beyond the deliberate goals and needs of the individual. In order to do so, an experience sampling method was applied in which 56 adolescents filled in a smartphone application six times, for a period of two weeks, with intervals of three months, to report *all* their moment-to-moment experiences of interest. By analyzing the content of these 8281 experiences of interest of 334 sustained interests chronologically, we found six mechanisms of interest sustainment. Two mechanisms were found in which individuals deliberately steered their sustainment, while four mechanisms were identified in which the object and/or practice seemed to play a role in the sustainment. Our findings thereby demonstrate that future studies, in order to understand interest sustainment and development, should look beyond the active role of the individual in sustaining interests.

1. Introduction

Interest plays a significant role in adolescents' learning and development (Renninger & Hidi, 2017). Interest can be defined as a preferred engagement of a person with a specific object (Krapp, 2002). Objects of interests can be topics, ideas, activities or events (Akkerman & Bakker, 2019). Adolescents that experience interest show high intrinsic motivation to learn (Harackiewicz, Durik, Barron, Linnenbrink-Garcia, & Tauer, 2008; Hidi & Renninger, 2006), experience positive emotions, and over time report high wellbeing (Renninger & Hidi, 2017; Schulz, Schulte, Raube, Disouky, & Kandler, 2018). This is an important reason to try and explain when individuals' interest is triggered as well as *sustained* over time, where sustainment in terms of Prenzel (1992) would be defined as a "prolonged relation with an object of interest that involves repeated episodes of active engagement over time" (p. 78).

Previous psychological interest research has often attributed sustainment solely to the 'drive' of the individual: interest is often associated with an individuals' expertise (e.g. Renninger, 2000), goal pursuit (e.g. Hofer, 2010) and identification with the object (e.g. Deci, 1992; Krapp, 2002). These studies stress that an interest is sustained if the interest is compatible with an individual's goals and values (Krapp, 2002). Although psychological research shows that individuals deliberately sustain interests (Hofer, 2010; Krapp, 2002), socio-cultural, cultural-historical and ecological research has indicated that focusing on the individual alone is not sufficient to understand interest sustainment. Interests are experienced in multiple ways, suggesting that there may also be different ways in which an interest may be sustained over time (Draijer, Slot, Bakker, & Akkerman et al., submitted; Akkerman, Vulperhorst, & Akkerman, 2019). More specifically, social practices and routines may play more of a role in interest sustainment than previously acknowledged (Akkerman & Bakker, 2019; Azevedo, 2011, 2018). Gaining insight into the different mechanisms of interest sustainment might lead to a detailed and differentiated understanding of how interests develop over time as well as provide insight for educational practice in the multiple processes that play a role in adolescents' interest development.

1.1. Multiple ways of sustaining interests

Interest research focused upon interest sustainment, has been oriented mostly to the way individuals pursue their interests more or less deliberately, for example in terms of achieving personal goals (Hidi & Renninger, 2006; Hofer, 2010), satisfying personal values or needs (Krapp, 2002; Prenzel, 1992) or in terms of expressing their personal identity (Krapp, 2002). These studies portray the individual as the agent responsible for sustaining interest, suggesting this to occur independently of available structures and opportunities in daily life. This assumption is even included in the widely used concept 'individual interest', as the individual is assumed to deliberately seek repeated engagement with his or her interest (Hidi & Renninger, 2006). Individual interest is predominantly used in literature to describe the sustained interests of individuals.

However, recent studies have found that sustained interests can be experienced in multiple ways (Draijer et al., submitted; Akkerman et al., 2019). Based on a latent profile analysis of indicators that seem to underly individual interest, these studies have found that engagement for some interests is associated with high personal value, flow and levels of agency (self-initiation), suggesting the individual may deliberately direct and sustain interests. At the same time, they found that individuals engaged with interests in a more routine way, as some interests were associated with low personal value, flow, and agency (Draijer et al., submitted; Akkerman et al., 2019). For example, one might have the long-term habit of listening to music in the shower every day, without deliberately directing the sustainment of this interest. There are indications that interests sustained in this way, may more likely represent ordinary aspects of daily life, like watching television or eating, suggesting that not only the individual but also the individual's daily life rhythm and routines might influence sustainment (Larson & Verma, 1999; Slot, Akkerman, & Wubbels, 2019).

These findings align with interest research from socio-cultural and cultural-historical perspectives, highlighting that interests may be sustained because engagement is embedded in a particular community (Azevedo, 2011; Nolen, 2019). Belonging to a community provides opportunities as well as meaning and direction for sustainment (Azevedo, 2011, 2013). Over time, individuals might attune their preferences to the community's practices and conditions, developing their own distinctive patterns of engagement (Azevedo, 2011). Engagement may thus revolve over time around participating in a community, as individuals might experience their participation as rewarding, without pursuing particular goals. For example, one might be singing in a choir every Tuesday evening in Church. Engagement in this case may be largely context-dependent, and might be abandoned as soon as the community stops to exist or changes (Akkerman & Bakker, 2019). Hence, research shows that there may be multiple ways of sustaining interest, suggesting that sustainment can best be understood by looking also *beyond* the deliberate reasons an individual provides for sustainment.

1.2. Mechanisms of interest sustainment

This shift towards understanding interest sustainment as being embedded in an individuals' participation in practices and routines across different contexts (see Akkerman & Bakker, 2019; Chesworth, 2018) implies one should also make a shift in how interest sustainment is studied. Sustainment has been typically studied through focusing on the reasons an adolescent provides for the sustainment of specific interests. This is problematic, not only because contextual processes may remain underexposed but also because interest sustainment may be expected to change over time (Prenzel, 1992; Valsiner, 1992) . Narrative research has shown that adolescents might highlight different reasons for sustaining an interest over time (e.g. Holmegaard, Ulriksen, & Madsen, 2015), confirming that focusing on the reasons in one moment in time may not fully capture how interests are sustained.

Therefore, one should focus on the processes or *mechanisms* involved in interest sustainment (see Maxwell, 2004). In order to identify these sustainment mechanisms, tracing how individuals experience interest across specific moments *over time* becomes pertinent (e.g. Chesworth, 2018; Prenzel, 1992; Ramey & Stevens, 2018). Based on human experience literature (Gillespie & Zittoun, 2013; Zittoun et al., 2012), we may argue that incorporating these moment-to-moment experiences into analyses allows the identification of various mechanisms involved in sustainment: individuals might provide explicit reasons for sustaining in an object *within* a particular moment in time, but mechanisms might also be revealed by studying all situated experiences of interest *chronologically,* considering similarities and prolongation of reasoning across experiences.

1.3. The present study

In order to gain a detailed and differentiated understanding of the mechanisms involved in interest sustainment we use a person-centered approach that was put forward by Akkerman and Bakker (2019). They posited that looking from the perspective of the individual towards how they experience interest in daily life may help to better understand how practices and situations shape interest over time. In order to identify interest sustainment mechanisms, the present study aims to trace adolescents' moment-to-moment experiences of prolonged interest in objects, as suggested by Prenzel (1992). Practically, our study provides insight in mechanisms of adolescents' sustained interests, even when the individual does not deliberately steer sustainment. The following research question was posed: *What mechanisms sustain adolescents'interests?*

2. Method

To trace experiences of interests over time we used the experience sampling method (ESM). This method has been proven useful for obtaining empirical data on psychological states, daily activities, and social interactions in a moment-to-moment fashion, making it possible to measure adolescents' experiences of interests multiple times a day (Csikszentmihalyi & Larson, 2014). Moreover, this is regarded a suitable method because individuals have to respond immediately after or even during an experience of interest, which avoids memory problems (Bergin, 2016).

2.1. Participants

Participants in this qualitative ESM study were drawn from a sample of 90 adolescents (Slot et al., 2019), who took part in six data collection waves between February 2016 and June 2017. Over 75% (*n* = 69) participated till the end of the data collection, but thirteen of these participants had one wave missing. The 56 remaining adolescents with complete data (18 boys, 38 girls) were 14–15 years of age in the period of the data collection. During the data collection, participants transitioned from grade 9 to grade 10. Adolescents were enrolled in four different schools from different regions in the Netherlands. All participants took part in our study voluntarily. Informed consent was obtained from all individual participants and their parents before participation.

2.2. Instrument

A smartphone application called '*inTin*' was used as an ESM, in which participants received signals on their phones every 2 h (during waking hours) to answer questions about their experiences of interest (Hektner, Schmidt, & Csikszentmihalyi, 2007). If they experienced interest, they had to report about it in an interest event. An interest event provided us with information on *how* they engaged in the object of interest, i.e. what they were doing/thinking/talking about, with whom they shared their interest, and *why* they experienced interest at that moment (i.e. their experience of interest). Such an interest event thus informed us about one's real-time experience with an object of interest. For example, Vera reported that she experienced interest in working at the 9th of September 2016 at 19:28. She explained that she was helping customers and chatting with her colleague Sharon. She reported to experience interest as she 'likes building a relationship with Sharon and learning to understand what her customers want'.

2.3. Procedure

Data collection started in February 2016 and ended in June 2017. In total, our participants took part in six data collection periods of two weeks, which were held every three months (February – June - September – December – March – June). Prior to the first period of data collection, participants received a 1.5-hour instruction during which we discussed what interests are and how to correctly use the application 'inTin'. Participants practiced filling in the application and we allowed time to answer any questions they might still have. After the meeting, we asked them to take part in a one-week pilot study in November 2015 in order to be prepared for the daily task of reporting activities; all participants agreed. During this pilot study we mainly worked on optimizing the technicalities of the application and had daily contact with our participants, asking them how they were doing and providing them with feedback when needed.

At the start of each data collection period, participants had to enter all objects that they perceived as their interests (i.e. activities, topics, ideas or events that they preferred spending their time on). No predefined categories were made to allow participants to define their object of interest themselves. Moreover, they were asked to add all social contacts they see regularly or that are important to them. During data collection, interests or social contacts could be added to the list each time a participant added an interest event. When participants subsequently received a notification on their smartphone, they first indicated whether they had done anything interesting. If that was the case, subsequent questions related to the interest event were asked (see the Instrument section), if this was not the case, they could go to the end of the report immediately. Every participant was supported and motivated by a research assistant during each data collection period. These assistants acted as coaches, and were instructed to encourage ('Good job, you are almost halfway!') and help participants to fulfill the criteria of payment ('Do not forget to report your interests this morning/afternoon/evening: Did you spend time on any interesting topics or activities?').

Participants were offered financial compensation for every data collection period if they fulfilled payment criteria (25 €). These criteria were as follows: (1) participants filled out at least three reports a day for two weeks, (2) these reports were spread throughout the day (i.e., morning, afternoon, and evening), (3) their reports were accompanied by clear and elaborative comments on why they experienced interest, and (4) participants added ten contacts and two different social groups to their mobile application. Ethical approval for this study was received from the ethical review board of the Faculty of Social and Behavioural Sciences of Utrecht University (FETC15-035).

2.4. Data analysis

Before analysis, we identified all sustained interests for each participant. In line with our definition of sustainment (Prenzel, 1992) we included interests that were actively engaged with over a relatively long period of time. Therefore, participants had to report their object of interest at least once in at least four of the six data collection periods (not per se each period, as interests can be latent for a while and then re-appear; Akkerman & Bakker, 2019), resulting in a hypothetical minimum of four events for analysis. We realized how this excluded not only short-term engagements, but also season-dependent interests that are sustained if you look over the course of multiple years (e.g. skiing, see Akkerman et al., 2019).

We regarded different interest labels (i.e. how a participant labelled an interest when adding it to the application) across data collection periods as the same object if the labels were similar in terms of the interest engagement it represented (e.g. playing soccer and soccer). In total, this resulted in an analysis of 56 participants, with 334 sustained interests (5.6 sustained interests on average per person) across 8281 reported interest-events, in total with a range between 4 and 171 events per sustained interest. We checked whether different types of interests (e.g. sports, media, school) were included in the analysis, to make sure mechanisms were not limited to a certain type of interest. A large diversity exists in terms of what types of interests were included in analysis (see Appendix A).

After identifying the objects for analysis, we started thematically coding the interests of twelve participants (Braun & Clarke, 2006). First, we read through all interest events that belonged to the sustained interests of these adolescents and subsequently drew 'timelines' for each sustained interest of these twelve participants, as this allowed us to see how experiences of interest change, remain similar or build upon each other over time. Each interest event in a timeline included information on the interest label, what the adolescent reported to be engaged in (i.e. situational engagement), and why one experienced the object as interesting in that particular event (i.e. experience of interest). With regard to the question *why* it was interesting, we noticed that adolescents reflected on their experience of interest in the here-and-now (termed a momentary experience of interest) or by reflecting back on past or (imagined) future experiences with the object of interest (termed a moment-*surpassing* experience of interest; see Gillespie & Zittoun, 2013).

Secondly, we applied open coding to identify *chronological references* to past, present and future in each experience of interest, i.e. on being a momentary or moment-surpassing experience of interest, or a combination of both, as well as on *what* the individual referred to as interesting in their experience of interest. Thirdly, we explored themes in how adolescents chronologically *qualified* their sustainment. This was done separately for momentary and moment-surpassing experiences. When moment-surpassing experiences of interests were mentioned, qualifications could be directly coded (e.g. 'I have always liked playing the piano'), as adolescents explicitly referred to their past or anticipated future in their experience of interest. Concerning momentary experiences, qualifications could be identified by searching across the whole chain of interest events for similarities in chronological references (e.g. repeatedly mentioning 'It was fun to do', or 'It was enjoyable'). Axial coding was applied to all qualifications by comparing and contrasting them, eventually identifying the mechanisms explaining interest sustainment (e.g. joy and fun were merged in enjoyment). Finally, we applied selective coding through checking and refining these mechanisms in the data of the remaining 44 participants with a confirmatory approach (see also Quality Assurance).

2.5. Quality assurance

To assure quality of the data analysis, several strategies were employed. First, analyses were done by the first two authors together, to check each other's interpretation and to come to final themes. Subsequently, themes and final mechanisms were discussed with the whole research team. This process of researcher triangulation may contribute to the credibility and confirmability of our results (see Guba, 1981). Second, to assure dependability, we asked the third author to conduct a formative audit after analyzing the second group of 44 participants (Akkerman, Admiraal, Brekelmans, & Oost, 2008; De Kleijn & Van Leeuwen, 2018). In this audit, the third author checked the data and our interpretation of the data, and suggested minor changes in how we coded and named the final mechanisms, which we agreed upon. The most prominent change that was a result of the audit, was the adding of a sixth mechanism (i.e. progress valuation), that we did not identify as a separate mechanism after the first round of exploratory analysis. Third, the audit trail was repeated with an independent researcher who was not involved in this study but was working in the same research team in the department. She was given access to the data of all 56 participants including the coding and a description of our data analysis that is similar but more detailed than the above. She performed a *summative* audit to assure dependability and confirmability of the data analysis, where summative implies that her judgment could not be used to improve the study, but to validate the reported results (De Kleijn & Van Leeuwen, 2018). She indicated to understand the coding process and the subsequent results and had some minor suggestions on how to increase transparency and understandability of our analysis and result sections.

Table 1

Sustainment mechanisms including an explanation and illustrative examples of experiences of interest characteristic for the mechanism.

Mechanism of…	Interest sustainment resides in…	Example
Goal setting	An individual's setting of a goal (i.e. future desirable state)	"I want to become a better hockey player"
Biographical identification	An individual's identification with historical participation in an object	"I love playing the piano, I always have"
Progress valuation	An individual's valuing of knowledge or skill progression	"I learnt more about this topic/Working in the lab helps you to understand how it works"
Chronotopical captivation	An individual's continuing curiosity in a storyline evolution	"I am eager to know how the story continues"
Engagement appreciation	An individual's repeated positive appreciation of engaging in an object	"It was fun/I enjoyed this/It was relaxing/We laughed a lot"
Substantive participation	An individual's sizeable and manifold participation in a practice like school	"I got a good grade"/"I liked talking to friends in the break/the class on micro-organisms was interesting"

3. Results

Based on the chronological qualifications that adolescents made in their experiences of interest, we identified six sustainment mechanisms (see Table 1).

First, sustainment lay in individuals' goal setting; adolescents referred in their experiences of interest to a future desirable state like wanting to master a skill or becoming better in something. This mechanism of *goal setting* was reflected in adolescents' *moment-surpassing* experiences of interest; adolescents qualified their experience of interest by referring to a goal (e.g. becoming a better piano player, learn to speak English), sometimes by additionally reflecting back on their growth since a previous engagement (e.g. improving my weaknesses). In some cases, goals were less explicit, as adolescents were fantasizing about possibilities in the future (e.g. I might want to live in England). Illustrating this mechanism of goal setting, Lazlo indicated multiple times when experiencing interest in hockey that he was working towards the goal of becoming a better hockey player (e.g. 'training is nice as I can improve my weaknesses', 'I see how much I have grown since last year', 'I can apply techniques in the game that I learned in training'). Sometimes, adolescents additionally made implicit references to the goal they set. For example, Lazlo stated 'we lost, but we did our best and that's good I think'. This may not reflect an explicit goal in the specific experience of interest, but can be understood in terms of his desired state of becoming a better hockey player.

Second, sustainment lay in an individuals' identification with a historical participation in their object of interest. Similar to the first mechanism, this mechanism of *biographical identification* was reflected in adolescents' *moment-surpassing* experiences of interest, where they recalled their personal history of participation with an object, or their love or liking for the content (e.g. I have always loved dancing). An example of this mechanism can be found in Bram's engagement with gaming. Bram reflected in multiple experiences on how he just loves to play games, including specific parts of his object he seemed to identify with (e.g. ' I always like playing games after school', 'I just love sci-fi', 'Gaming is just something I like to do in my spare time'). Thus, adolescents can qualify their sustainment by referring to an image of themselves based upon their long-term engagement with an object (e.g. I am someone who loves to game), as they express through their interests who they are and what they like. Both the mechanisms of goal setting and biographical identification reside in someone's references to his/her, sometimes distant, future or past.

Third, sustainment resided in individuals' continuous valuing of progression in knowledge or skills. This mechanism of *progress valuation* became apparent across multiple *momentary* and *moment-surpassing* experiences. Individuals qualified their sustainment in terms of increasing their knowledge or skills with regard to particular content (e.g. 'I know more now than I did before'), reflecting on personal growth that goes beyond the immediate situation. Yet, this progress appeared to be triggered and shaped by learning opportunities in the *situation*. This mechanism of progress valuation can therefore be distinguished from the mechanism of goal setting, as individuals were not deliberately pursuing a 'desirable state' in the future, but rather valued the progress they noticed in each situation. To illustrate this mechanism further, a part of the timeline of Zania's engagement in biology is illustrated in Fig. 1. In her experiences of interest, we could not identify a goal, in that she is deliberately working towards becoming an expert in biology, but she rather seemed to value each time
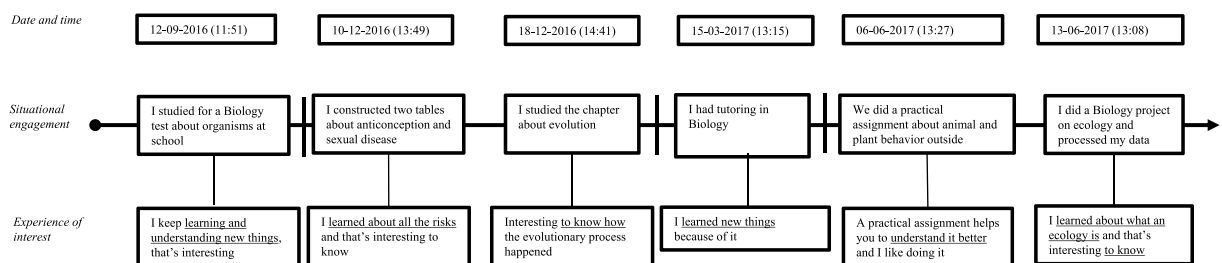

Fig. 1. Visualization of part of Zania's moment-to-moment engagement in the sustained interest biology, illustrating the mechanism of progress valuation. *Note.* The underlined text highlights how Zania continuously values her progression in learning about biology.
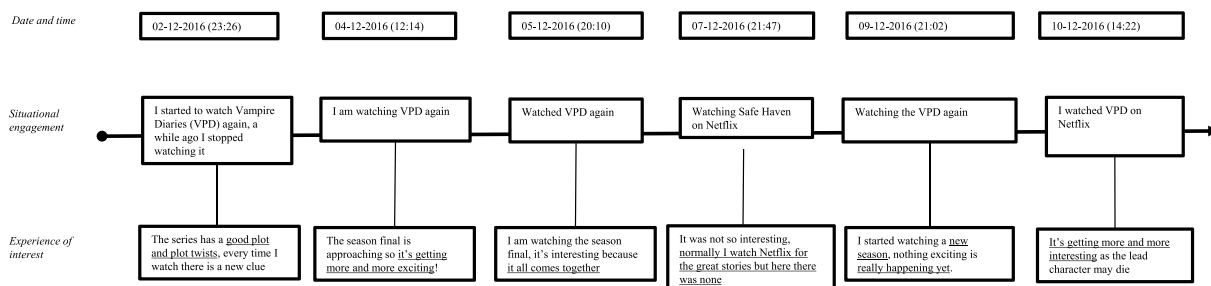
Date and time	02-12-2016 (23:26)	04-12-2016 (12:14)	05-12-2016 (20:10)	07-12-2016 (21:47)	09-12-2016 (21:02)	10-12-2016 (14:22)
Situational engagement	I started to watch Vampire Diaries (VPD) again, a while ago I stopped watching it	I am watching VPD again	Watched VPD again	Watching Safe Haven on Netflix	Watching the VPD again	I watched VPD on Netflix
Experience of interest	The series has a good plot and plot twists, every time I watch there is a new clue	The season final is approaching so it's getting more and more exciting!	I am watching the season final, it's interesting because it all comes together	It was not so interesting, normally I watch Netflix for the great stories but here there was none	I started watching a new season, nothing exciting is really happening yet.	It's getting more and more interesting as the lead character may die

Fig. 2. Visualization of part of Laura's moment-to-moment engagement in the sustained interest Netflix, illustrating the mechanism of chronotopical captivation. *Note.* The underlined text highlights how Laura is continuously captivated each time by the storyline of the series.

she learned something new about the domain biology. As can be seen from the Figure, she reported to experience interest as she is 'learning about risks of sexual diseases' or 'I know more about ecologies now'. This mechanism thus seems to revolve around gaining new knowledge and skills over time and valuing learning opportunities in the situation, without formulating a clear goal pursuit.

Fourth, sustainment resided in an individuals' continuing curiosity in the evolution of a storyline. This mechanism of *chronotopical captivation* became apparent across multiple *momentary and moment-surpassing* experiences of interest, where adolescents repeatedly referred to the evolution of a chronotope (e.g. watching the next episode of a series or the season finale; wondering who is going to be champion in the soccer competition). More specifically, adolescents referred in their experiences of interest that they were captivated by characteristics of an object; they continuously wished to know how the storyline of the object evolved over time. This curiosity towards the evolution of a storyline was most often found in objects that were designed to have clear and compelling storylines (e.g. books, series, games), but could for example also be found in objects that revolved around following a sports competition. As this mechanism could only be identified across multiple experiences of interest, we included another figure to illustrate this mechanism. As becomes clear from Fig. 2, Laura reported to be interested in Netflix and focused in her experiences of interest on the main storyline of a series she watched. Her experiences of interest reflected back on previous engagements with her object (e.g. 'It's more exciting than last time, everything comes together now'), but mainly evolved around being curious what will happen in future engagements with the object (e.g. 'I wonder what will happen next time'). A chronotope may end (e.g. end of series), which often led adolescents to search for a new storyline. They regularly found periods in between storylines less interesting as they had to 'get into a new story' (e.g. 'nothing exciting has really happened yet this season'; 'it was not so interesting, the story is lacking'). This mechanism of chronotopic captivation thus seems to rely on the characteristics of the specific object that can catch one's interest (e.g. exciting writing style, cliff-hangers, unexpected happenings).

Fifth, sustainment lay in individuals' repeated appreciation of their engagement with an object. This mechanism of *engagement appreciation* became apparent across multiple *momentary* experiences of interest in which adolescents repeatedly mentioned that they liked engaging with an interest in the moment. Adolescents reported in their momentary experiences of interest to experience fun, excitement, relaxation, or enjoyment when engaging with their interests. Often, this revolved around doing things together with others (e.g. peers, family, colleagues). To illustrate this mechanism further, we included part of Vera's engagement in music (Fig. 3). Vera's experiences of interest repeatedly reflected why she appreciated listening to music, as this was relaxing or fun in the moment (e.g. 'A way to relax after a long day of learning', 'It was fun to discover new music', 'Music provides a good vibe for the party'). Her experiences of interest also revealed that adolescents can appreciate the moment by contrasting the engagement to past or anticipated experiences. For example, while engaging in her interest in music, Vera reported she *anticipates* Christmas as she likes to get in the Christmas mood, *remembers* how fun the concert of Adele was last night and likes to discover *novel* songs. This mechanism thus seems to revolve around appreciating a specific object engagement in any given situation, where a situation can be appreciated because of the characteristics of the moment itself (e.g. presence of social others), or because it evokes certain memories, anticipatory thoughts or something novel/something other than normal. This suggests that the characteristics of a *situation* (i.e. opportunities for engagement) become important for sustainment; each situation is unique in terms of the opportunities it brings for engagement and how an individual interprets these opportunities.

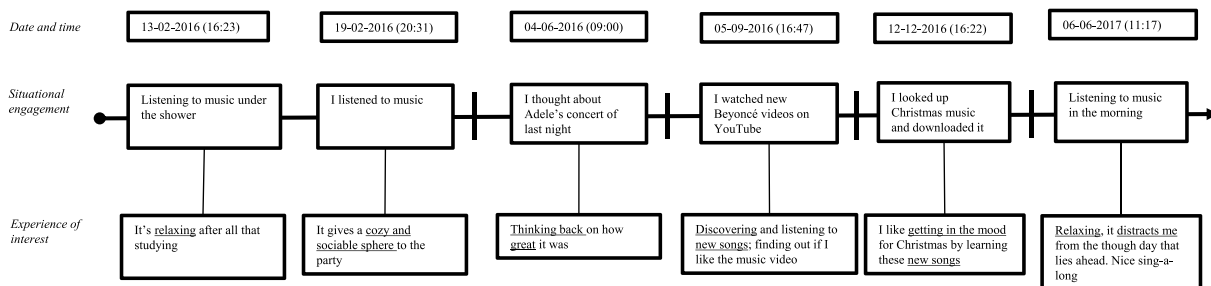| Date and time	13-02-2016 (16:23)	19-02-2016 (20:31)	04-06-2016 (09:00)	05-09-2016 (16:47)	12-12-2016 (16:22)	06-06-2017 (11:17)
Situational engagement	Listening to music under the shower	I listened to music	I thought about Adele's concert of last night	I watched new Beyoncé videos on YouTube	I looked up Christmas music and downloaded it	Listening to music in the morning
Experience of interest	It's relaxing after all that studying	It gives a cozy and sociable sphere to the party	Thinking back on how great it was	Discovering and listening to new songs; finding out if I like the music video	I like getting in the mood for Christmas by learning these new songs	Relaxing, it distracts me from the though day that lies ahead. Nice sing-a-long

Fig. 3. Visualization of part of Vera's moment-to-moment engagement in the sustained interest music, illustrating the mechanism of engagement appreciation. *Note.* The underlined text highlights how Vera repeatedly appreciates her engagement in music in terms of gaining a positive state.

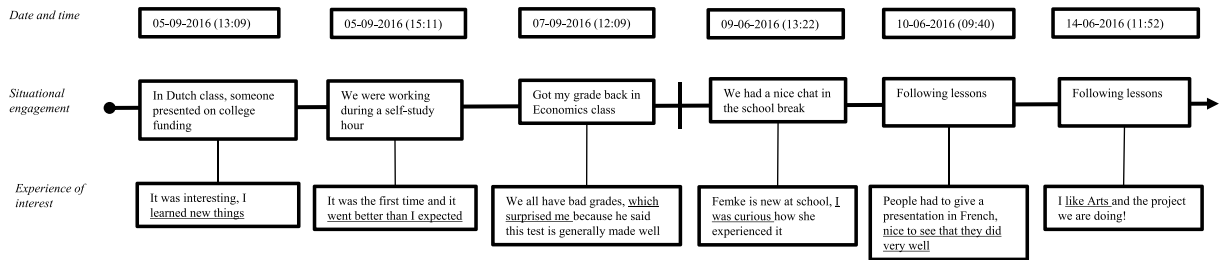| Date and time	05-09-2016 (13:09)	05-09-2016 (15:11)	07-09-2016 (12:09)	09-06-2016 (13:22)	10-06-2016 (09:40)	14-06-2016 (11:52)
Situational engagement	In Dutch class, someone presented on college funding	We were working during a self-study hour	Got my grade back in Economics class	We had a nice chat in the school break	Following lessons	Following lessons
Experience of interest	It was interesting, I <u>learned new things</u>	It was the first time and it <u>went better than I expected</u>	We all have bad grades, <u>which surprised me</u> because he said this test is generally made well	Femke is new at school, <u>I was curious</u> how she experienced it	People had to give a presentation in French, <u>nice to see that they did very well</u>	<u>I like Arts</u> and the project we are doing!

Fig. 4. Visualization of part of Nathans' moment-to-moment engagement in the sustained interest school, illustrating the mechanism of substantive participation. *Note.* The underlined text highlights how Nathan refers to something else in his participation each time he reports to experience interest.

Finally, sustainment resided in adolescents' substantive (i.e. sizeable and manifold) participation in a practice like school. This mechanism of *substantive participation* became apparent when looking at interests adolescents reported regarding school (e.g. learning, following lessons, school), although not all school-related interests were sustained in this way: adolescents could for example sustain in school through setting goals (e.g. school is important for my future). Across their momentary experiences of interests, adolescents appeared to 'seek' something interesting in each situation (e.g. in a lesson, while doing homework), and what was interesting to adolescents seemed to diverge over time. As can be seen in Fig. 4, where Nathaly's reported engagement in school can be found, her experiences of interest varied widely from moment-to-moment. These constant shifts in her qualifications imply that her experiences of interest in school were focused on characteristics of the specific situations (e.g. lessons, homework) she engaged in, without her explicating why she sustained in school in general (e.g. see Fig. 4 where Nathaly regulates interest in presentations, self-study hours and specific subjects). Hence, this mechanism appeared to be connected to the opportunities provided by the substantive participation for experiencing interest. As can be seen in Fig. 4, this did not mean that no other mechanisms could be identified that sustained the interest (e.g. 'I always have liked arts'), but these mechanisms could not explain sustainment in a person's whole object of interest (e.g. school).

3.1. Simultaneous involvement of sustainment mechanisms

Although we found six different sustainment mechanisms, objects of interest were often sustained through the simultaneous involvement of several of these mechanisms. Our findings presented thus far have shown how interest sustainment is not only associated with the goals and personal preferences an individual refers to in the moment, but also resides in object- and context-specific characteristics inherent to one's real-time, moment-to-moment engagement with an object *over time*. In this simultaneous involvement of sustainment mechanisms, we noticed that over time some mechanisms became more or less foregrounded in the experiences of interest. Moreover, we found indications that new sustainment mechanisms may develop over time. To illustrate how mechanisms might simultaneously be involved in interest sustainment, we have included a last example (Fig. 5) of part of Kelly's
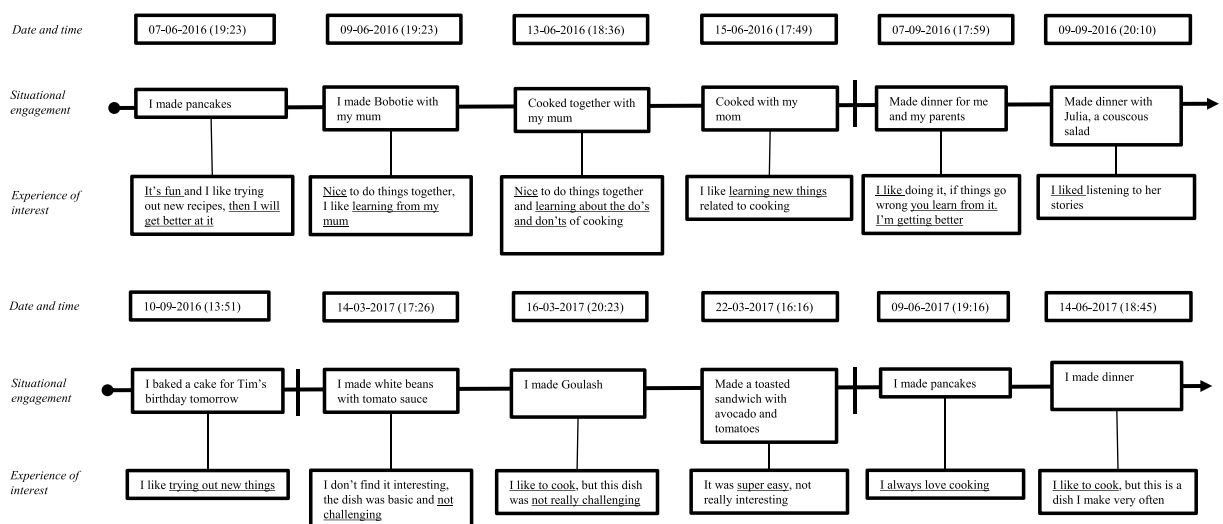
Date and time	07-06-2016 (19:23)	09-06-2016 (19:23)	13-06-2016 (18:36)	15-06-2016 (17:49)	07-09-2016 (17:59)	09-09-2016 (20:10)
Situational engagement	I made pancakes	I made Bobotie with my mum	Cooked together with my mum	Cooked with my mom	Made dinner for me and my parents	Made dinner with Julia, a couscous salad
Experience of interest	<u>It's fun</u> and I like trying out new recipes, <u>then I will get better at it</u>	<u>Nice</u> to do things together, I like <u>learning from my mum</u>	<u>Nice</u> to do things together and <u>learning about the do's and don'ts</u> of cooking	I like <u>learning new things</u> related to cooking	<u>I like</u> doing it, if things go wrong <u>you learn from it.</u> <u>I'm getting better</u>	<u>I liked</u> listening to her stories

Date and time	10-09-2016 (13:51)	14-03-2017 (17:26)	16-03-2017 (20:23)	22-03-2017 (16:16)	09-06-2017 (19:16)	14-06-2017 (18:45)
Situational engagement	I baked a cake for Tim's birthday tomorrow	I made white beans with tomato sauce	I made Goulash	Made a toasted sandwich with avocado and tomatoes	I made pancakes	I made dinner
Experience of interest	I like <u>trying out new things</u>	I don't find it interesting, the dish was basic and <u>not challenging</u>	<u>I like to cook</u>, but this dish was <u>not really challenging</u>	It was <u>super easy</u>, not really interesting	<u>I always love cooking</u>	<u>I like to cook</u>, but this is a dish I make very often

Fig. 5. Visualization of part of Kelly's moment-to-moment engagement in the sustained interest cooking, illustrating the simultaneity of mechanisms. *Note.* The underlined text highlights how Kelly's interest sustainment over time is associated with mechanisms of goal-setting, engagement appreciation as well as biographical identification.

interest in cooking. The first few times she engaged with cooking, Kelly was focused on learning new recipes and becoming better in cooking (i.e., mechanism of goal setting) but in subsequent events a positive state was also highlighted (e.g. 'It is fun to do', 'I like to spend time with Julia'; mechanism of engagement appreciation), suggesting both mechanisms may explain Kelly's sustainment in cooking. Half a year later she mentioned that cooking did not provide a challenge for her anymore, which might mean she did not get the feeling that she was still working towards the goal. Instead, we could see that cooking developed into a personal preference for cooking (e.g. 'I like to cook', 'I have always loved cooking'), and that she sustained in the interest because she identified herself with cooking at this point.

4. Discussion

The aim of the present study was to provide a detailed and differentiated account of the mechanisms involved in interest sustainment, beyond the active role of the individual in sustaining interest. Together, the sustainment mechanisms we found show that an individuals' goal setting as well as identification with an object are important for understanding interest sustainment, but that other processes become visible when taking into account the whole 'history' of one's moment-to-moment engagement with an object (Prenzel, 1992).

Our finding that individuals may intrinsically steer interest sustainment over time in terms of goal setting or biographical identification is largely in line with previous interest development research (e.g. Hidi & Renninger, 2006). The importance of personal goals for sustaining interests has already been acknowledged by multiple scholars (Hofer, 2010; Krapp, 2002; Nolen, 2019; Prenzel, 1992), as well as the importance of individuals' preferences and identification with certain objects of interest (e.g. Prenzel, 1992; Renninger & Hidi, 2017). Adolescents may deliberately evaluate if they find their interests fitting with their image of self and if they see themselves sustaining this interest in the future (Azevedo, 2011; Barron, 2006; Hedges, 2018).

When object- or context-specific characteristics are foregrounded in one's momentary experiences of interest, sustainment may be less on an 'action level' (Akkerman & Bakker, 2019), i.e. characterized by conscious pursuit and active engagement, and instead revolve around certain *routine-* or *practice-based* engagements. First, individuals may sustain their interests over time because they value learning opportunities in specific practices (e.g. in a biology class, but also YouTube; Barron, 2006) to develop their knowledge or competence with regard to particular content. We found that this progression is not necessarily linked to a distant goal of becoming better in something, as individuals may value learning something new in the specific situation. Furthermore, individuals may sustain interest because they repeatedly appreciate their engagement, often in terms of positive feelings (i.e. relaxation, enjoyment, social sharing) that may be inherent to participating in their specific routines or practice-based activities (e.g. skateboarding, see Hollett & Hein, 2018). Moreover, adolescents may re-engage with particular content over time because the storylines in books and series tend to captivate them: the characteristics of the object, such as exciting plot twists, may direct adolescents to sustain their interest over time. Finally, a substantive participation may play a role in sustainment. If adolescents have to spend a large amount of their time in a practice like school that provides manifold opportunities for experiencing interest, adolescents might find something different in each moment that may evoke interest (Sansone & Thoman, 2005). These processes that appear context- and object-dependent are mentioned in the literature, but mostly with regard to the *triggering* or emergence of interests (e.g. Bergin, 1999; Hidi & Renninger, 2006). Thus, our study can add to theory by showing that aspects that are solely attributed to understanding the emergence of interest (e.g. participating in a practice, positive emotions, storylines), may also be important for understanding interest sustainment.

As already suggested by socio-cultural and cultural-historical approaches, we may thus conclude that interests are not only sustained by deliberate intentions of the individual, but also by other object-specific and contextual processes that are associated with engaging in interests over time. Interests were often sustained through the simultaneous involvement of various mechanisms. Which mechanism may be foregrounded in a specific experience of interest may be dependent on the social and material opportunities for engagement in the situation at hand. For example, whether someone experiences a positive state while engaging with an object or reports to be captivated by a storyline, may depend on the presence of social others (Chesworth, 2018). Moreover, changes in the social or material opportunities for pursuing a specific object of interest may play a role in how the sustainment mechanisms develop or change over time. For example, if one's best friend quits playing volleyball, this may lead an individual to qualify his or her sustainment less in terms of volleyball as being fun. Also, parents play a vital role in how adolescents sustain their interests, for example through providing means to pursue a specific object of interest (Crowley, Barron, Knutson, & Martin, 2015; Neitzel, Alexander, & Johnson, 2019).

These moment-to-moment opportunities for engagement may also play a role in whether the more 'deliberate' mechanisms are foregrounded. For example, a goal can be temporarily less foregrounded when one is busy with studying for exams or suffering from an injury, and might even disappear as a whole over time. This disappearance may be explained by the life-tasks of individuals, i.e. the developmental tasks that arise during certain age periods. According to Hofer (2010), interests may decline over time or be abandoned all at once if the goals are achieved or if preferences are no longer relevant for a person as he grows older and has to tackle other life-tasks (e.g. going to college). Hence, sustainment mechanisms should not be regarded as static entities (i.e. like an on/off button) but instead as dynamic processes that are strongly connected to one's prolonged, real-time engagement with an object of interest and an individual's interpretation (Akkerman & Bakker, 2019; Azevedo, 2011).

4.1. Implications for research and practice

Our findings imply that *predicting* interest development is difficult, since persistent engagement can change from moment-to-moment: what determines interest sustainment is dependent on the 'fullness of life' (see Hedges & Birbili, 2019), i.e. both the object- and context-specific characteristics of a situation and how an individual interprets this with regard to their history of engaging with that object or their imagined future. A similar argument has been made by Akkerman and Bakker (2019) who have argued that the development of interests is dependent on the situatedness of one's engagement with a specific object in everyday life. They indicate that interest development may be difficult to predict because of the nonlinearity and fluid nature of interests, i.e. the possibility that interests develop and grow in different directions over time. We have empirically demonstrated this fluidity and nonlinearity, as various mechanisms simultaneously sustain interests and may become more or less foregrounded in the experiences of interest over time. For future research, this implies that studies should trace every object engagement from moment-to-moment across different contexts, if one aims to provide theoretical insight in how interests may develop over time (see Akkerman & Bakker, 2019). Moreover, this fluid and nonlinear nature of interest additionally implies that it is difficult for practitioners to predict whether and how students' interests develop over time.

4.2. Limitations and future research

In the present study we asked adolescents how they experience interest in a particular object from moment-to-moment, to derive sustainment mechanisms. This can be considered a strength on one hand, as the measurement of these 'real-time' experiences of interest leads to a differentiated understanding of why adolescents sustain interest (see Akkerman & Bakker, 2019; Bergin, 2016; Hollett, 2016; Prenzel, 1992). On the other hand, the experience sampling method is very focused on how the individual may indicate to experience interest, fully relying on momentary self-reports. Observations and follow-up interviews after reporting may be helpful for future research to study the processes underlying sustainment, especially to further study sustainment mechanisms that seem to be more associated with object and context characteristics.

Moreover, our definition of sustainment (i.e. "prolonged relations with an object of interest that involves repeated episodes of active engagement over time"; Prenzel, 1992) may have narrowed the scope of this study. Through having the strict requirement that interests should be sustained for at least a year, we may have excluded specific interests. For example, interests that may be engaged with over a large timespan, but only for a short period (e.g. snowboarding can only be done in winter time; Akkerman & Bakker, 2019), where not included. Perhaps these interests, with yet a different way of engaging (i.e. season-specific) might have revealed different sustainment mechanisms. Nonetheless, we would like to stress that we have included a large enough variety of interests in this study to provide a nuanced understanding of adolescents' interest sustainment. Not only did we study 'active leisure' interests like hockey or piano playing, also 'passive leisure' interests like watching TV were included, and non-leisure interests like 'school' as well as maintenance interests like 'eating' were included (Hofer, 2010). Future research could validate the identified mechanisms through tracing adolescents' interest sustainment over a larger (connected) time span than the two-week data collection periods in this study.

A final limitation might be the age group in which we studied the sustainment of interests. Young adolescents' lives are still highly dominated by school (Csikszentmihalyi & Hunter, 2003) and we found that this substantive participation in school could sustain interest. We are curious whether we will find this sustainment mechanism in higher age groups (e.g. after the transition to higher education). Hence, future research is needed in other age groups to find out if the sustainment mechanisms we identified remain similar, or additional or different mechanisms can be found.

4.3. Conclusion

In sum, our study contributes to interest research by giving a detailed and differentiated account of interest sustainment through examining adolescents' moment-to-moment engagement with an interest. Adolescents may deliberately sustain interests through referring to past or future images of themselves, but interests may also be simultaneously sustained by objects and contexts. This may imply that we should reconsider whether to use the term 'individual interest' to describe sustained interests, as more than the individual may sustain an interest.

Acknowledgements

Declaration of competing interest

None.

Appendix A

Appendix Table A
Participants ($n = 56$), their number of sustained interests (including labels) as well as the number of interest events analyzed per interest and person.

Name	Sustained interests (N)	Object labels	Interest events (N)
199	10	Reading the newspaper	31
		Talking	27
		Cycling	54
		Bouldering	27
		Breaks	14
		Watching Netflix	10
		Music	11
		Watching the news bulletin	5
		Snapchat	8
		P.E.	5
269	5	Watching tv	33
		Reading	22
		Volleyball	29
		Listening to music	10
225 (Laura)	5	Music*	29
		Working	35
		Dancing	49
		Netflix	18
		Make-up	13
227 (Lazlo)	6	Watching tv	33
		Listening to music	50
		Playing piano	22
		Gaming/games	22
		YouTube	15
		Hockey*	11
226	4	Playing the piano	67
		Socializing	50
		Trains	34
		Time travelling	12
195	6	Gaming	23
		Hockey	31
		Watching movies	11
		Running	6
		Fitness	8
		YouTube	10
260 (Bram)	5	Eating	28
		Watching tv	20
		Cycling	12
		Gaming*	18
		School	40
229 (Kelly)	4	Hockey	12
		Netflix	41
		School	47
		Cooking*	18
284	2	Watching Netflix	14
		Playing soccer	16
193	6	Watching YouTube	46
		Playing a game	49
		Watching tv/Netflix	28
		Reading	21
		Listening to music	11
		Talking to friends	64
242 (J)	6	YouTube	36
		School	112
		Gaming	99
		Anime	36
		Music	20
		Social media	15
246 (Nathaly)	6	Hockey	11
		Meeting friends	17
		School*	41
		Guitar playing	7
		Tennis	9
		Watching Netflix/series	8

Appendix Table A (*continued*)

Name	Sustained interests (N)	Object labels	Interest events (N)
275 (Zania)	1	Biology*	11
261	5	Listening to music	40
		P.E.	7
		Netball	31
		Meeting friends	17
		YouTube	49
201	10	Driving my scooter	29
		Watching Arrow/series	20
		WhatsApp	24
		Cycling	26
		Watching movies	10
		Music	53
		Instagram	18
		Shopping	4
		Volleyball	19
		YouTube	9
256	5	Dancing	20
		Guitar playing	10
		P.E.	6
		Chemistry	9
		Working at the McDonalds	19
207	5	P.E.	8
		Listening to music	34
		Netflix	35
		Tennis	35
		Watching tv	36
208	2	(Online) shopping	18
		Contact with people	56
279	4	Netflix/series/movies/tv	26
		School	30
		Work	20
		Friends/chilling with friends	32
258	8	Going into town	11
		Reading	13
		Dog	12
		Horse riding	19
		Drawing	10
		Watching tv	13
		Hiking	29
		YouTube	18
251	3	Athletics	40
		School	130
		Fitness/the gym	6
272	4	Family	38
		Friends	31
		iPad/phone	36
		Fencing	11
262	5	Watching a movie	9
		Listening to music	8
		Shopping (online)	7
		Series/Gossip Girl	29
		YouTube	15
230	9	Meeting up	16
		Faith/church	23
		Cooking	25
		Hiking	13
		Break/gap hour	21
		social media/WhatsApp	26
		Out for dinner	16
		Soccer	24
		Singing	17
205	3	Meeting friends	8
		Hockey	31
		Babysitting	10

Appendix Table A (*continued*)

Name	Sustained interests (N)	Object labels	Interest events (N)
212	6	Party	8
		Gaming	27
		Earning money	13
		Music	19
		Sports	18
		Soccer	38
217	4	Chilling	9
		FIFA	36
		Hockey	22
		Soccer	27
187	10	Chilling	16
		(Making) dinner	23
		Cycling	18
		Gaming	15
		Studying	15
		Listening to music	21
		School	32
		Sports	9
		Work	17
		YouTube	15
198	8	Biology	22
		English	34
		Physics	19
		Dutch	14
		Chemistry	12
		Netball	23
		Watching soccer	21
		Math	23
200	2	(Watching) Soccer	58
		FIFA	43
239	5	Gaming	34
		News	26
		Studying	24
		School	101
		Social Media	23
214	8	Meeting family/friends	57
		Series/Netflix	34
		Fashion	18
		Hockey	16
		School	30
		Social Media	32
		Sports	8
		Going out	15
216	2	Reading	42
		Dancing	46
218	6	Bass	27
		Play the drums	20
		Gaming/CS:GO	15
		Hockey	9
		Making music with the band	16
		Tennis	8
222	3	German	8
		French	9
		Hockey	11
223	5	Playing guitar	8
		Netball	11
		Music	13
		Piano playing	19
		Playing a game	10

Appendix Table A (*continued*)

Name	Sustained interests (N)	Object labels	Interest events (N)
236	10	Family	15
		Partying	5
		Cooking	16
		Babysitting	8
		Horse riding	6
		School	75
		Sailing	6
		Friends	60
		Leisure time	43
		Work	12
237	10	Friends/chilling	29
		Eating	10
		Party	4
		Listening to music	14
		Netflix	15
		Rugby	34
		School	85
		Watching tv	28
		Working	12
		YouTube	25
240	7	Meeting up	12
		Gaming	20
		Netball	72
		News reading	32
		Watching tv	35
		WhatsApping	29
		YouTube	68
243	14	Anime	11
		French	18
		Hair	6
		Instagram	6
		Jumbo	22
		Cooking	32
		K-pop	43
		Art	25
		Make-up	27
		Music	35
		Netflix	30
		Soccer	18
		Science	33
		YouTube	11
244	4	Gaming	46
		Watching tv	13
		Working	27
		YouTube	28
247	12	History	8
		Reading	8
		Global science	11
		Being with family	11
		Being with friends	17
		Music	11
		Babysitting	5
		School	19
		Watching tv	27
		Shopping	9
		YouTube	22
		Drawing	21
246	9	Hockey	34
		Walking the dog	44
		Getting food at Jumbo	6
		Cooking/baking	11
		Listening to music	39
		Babysitting	10
		Provide (hockey) training	6
		Watching tv	38
		YouTube	28

Appendix Table A (*continued*)

Name	Sustained interests (N)	Object labels	Interest events (N)
249	4	Watching movies	43
		Gaming	22
		Watching tv	68
		Swimming	72
202	5	P.E.	6
		Playing hockey	20
		Listening to music	21
		social media	24
		(Watching) soccer	5
203	8	Meeting up	12
		Chatting on the phone	10
		P.E.	7
		Instagram	27
		Listening to music	34
		Break	43
		Watching Pranks	19
		Watching tv	15
206	7	Watching movies	7
		Handball	30
		Cooking	15
		Reading	25
		Listening to music	41
		Netflix (series)	34
		Playing the piano	39
211	6	Acting	6
		Dancing	8
		Hockey	16
		Student Council	6
		Listening to radio	10
		Watching (Netflix) series	8
213	7	Hockey	45
		Cooking	17
		Reading	48
		Playing saxophone	49
		Shopping	16
		YouTube	27
		Watching series (on Netflix)	29
250	5	Cooking	12
		School	97
		Watching tv	11
		Working at the Vomar	29
		YouTube	83
253	5	Parties	9
		Hockey	22
		Class	14
		Netflix	18
		Break	8
264	9	Cycling	16
		Chatting	19
		Make-up	13
		Music	18
		Visiting others	9
		School	18
		Social media	9
		Watching tv	15
		Watching YouTube/Netflix	46
266	2	Sports	28
		Food (and subcategories)	24
270	4	Gaming	171
		9Gag	116
		Watching tv	21
		YouTube	78

Appendix Table A (*continued*)

Name	Sustained interests (N)	Object labels	Interest events (N)
276	13	Geography	7
		Do It Yourself	7
		English	6
		Math	7
		Cycling	12
		French	7
		History	12
		P.E.	9
		Reading	33
		Walking the dog	8
		Writing	9
		Drawing	17
		Watching tv	66
277	5	Dancing (and subcategories)	61
		P.E.	7
		Physic	10
		Watching tv	17
		Birthday	8
56	334		8281

Note.*Interest engagements that are drawn upon in the paper.

References

Akkerman, D. M., Vulperhorst, J. P., & Akkerman, S. F. (2019). A developmental extension to the multidimensional structure of interests. *Journal of Educational Psychology*. https://doi.org/10.1037/edu0000361 (Advance online publication).

Akkerman, S. F., Admiraal, W., Brekelmans, M., & Oost, H. (2008). Auditing quality of research in social sciences. *Quality & Quantity, 42*(2), 257–274. https://doi.org/10.1007/s11135-006-9044-4.

Akkerman, S. F., & Bakker, A. (2019). Persons pursuing multiple objects of interest in multiple contexts. *European Journal of Psychology of Education, 34*(1), 1–24. https://doi.org/10.1007/s10212-018-0400-2.

Azevedo, F. S. (2011). Lines of practice: A practice-centered theory of interest relationships. *Cognition and Instruction, 29*(2), 147–184. https://doi.org/10.1080/07370008.2011.556834.

Azevedo, F. S. (2013). The tailored practice of hobbies and its implication for the design of interest-driven learning environments. *Journal of the Learning Sciences, 22*(3), 462–510. https://doi.org/10.1080/10508406.2012.730082.

Azevedo, F. S. (2018). An inquiry into the structure of situational interests. *Science Education, 102*(1), 108–127. https://doi.org/10.1002/sce.21319.

Barron, B. (2006). Interest and self-sustained learning as catalysts of development: A learning ecology perspective. *Human Development, 49*, 193–224. https://doi.org/10.1159/000094368.

Bergin, D. A. (1999). Influences on classroom interest. *Educational Psychologist, 34*(2), 87–98. https://doi.org/10.1207/s15326985ep3402_2.

Bergin, D. A. (2016). Social influences on interest. *Educational Psychologist, 51*, 7–22. https://doi.org/10.1080/00461520.2015.1133306.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa.

Chesworth, L. (2018). Theorising young children's interests: Making connections and in-the-moment happenings. *Learning, Culture and Social Interaction* (Advance online publication).

Crowley, K., Barron, B. J., Knutson, K., & Martin, C. K. (2015). Interest and the development of pathways to science. In K. A. Renninger, M. Nieswandt, & S. Hidi (Eds.). *Interest in mathematics and science learning* (pp. 297–313). Washington, DC: AERA.

Csikszentmihalyi, M., & Hunter, J. (2003). Happiness in everyday life: The uses of experience sampling. *Journal of Happiness Studies, 4*(2), 185–199. https://doi.org/10.1023/A:102440973.

Csikszentmihalyi, M., & Larson, R. (2014). Validity and reliability of the experience-sampling method. *Flow and the foundations of positive psychology* (pp. 35–54). Dordrecht: Springer.

De Kleijn, R., & Van Leeuwen, A. (2018). Reflections and review on the audit procedure: Guidelines for more transparency. *International Journal of Qualitative Methods, 17*(1), 1–8. https://doi.org/10.1177/1609406918763214.

Deci, E. L. (1992). The relation of interest to the motivation of behavior: A self-determination theory perspective. In K. A. Renninger, S. Hidi, & A. Krapp (Eds.). *The role of interest in learning and development* (pp. 44–70). Hillsdale, NJ: LEA.

Draijer, J. M., Slot, E. M., Bakker, A., & Akkerman, S. F. (2019). *Beyond situational-individual distinctions: The multidimensional structure of interest.* (submitted).

Gillespie, A., & Zittoun, T. (2013). Meaning making in motion: Bodies and minds moving through institutional and semiotic structures. *Culture & Psychology, 19*(4), 518–532. https://doi.org/10.1177/1354067X13500325325.

Guba, E. G. (1981). Criteria for assessing the trustworthiness of naturalistic inquiries. *Educational Technology Research and Development, 29*(2), 75. https://doi.org/10.1007/BF02766777.

Harackiewicz, J. M., Durik, A. M., Barron, K. E., Linnenbrink-Garcia, L., & Tauer, J. M. (2008). The role of achievement goals in the development of interest: Reciprocal relations between achievement goals, interest, and performance. *Journal of Educational Psychology, 100*, 105–122. https://doi.org/10.1037/0022-0663.100.1.105.

Hedges, H. (2018). The "fullness of life": Learner interests and educational experiences. *Learning, Culture and Social Interaction.* https://doi.org/10.1016/j.lcsi.2018.11.005 Advance online publication.

Hedges, H., & Birbili, M. (2019). Conceptualising and researching interest/s as a learning phenomenon in contexts representing the fullness of human life. *Learning, Culture, and Social Interaction,* 1–4. Advance online publication https://doi.org/10.1016/j.lcsi.2019.100324.

Hektner, J. M., Schmidt, J. A., & Csikszentmihalyi, M. (2007). *Experience sampling method: Measuring the quality of everyday life.* Thousand Oaks, CA: Sage.

Hidi, S., & Renninger, K. A. (2006). The four-phase model of interest development. *Educational Psychologist, 41*, 111–127. https://doi.org/10.1207/s15326985ep4102_4.

Hofer, M. (2010). Adolescents' development of individual interests: A product of multiple goal regulation? *Educational Psychologist, 45*, 149–166. https://doi.org/10.1080/00461520.2010.493469.

Hollett, T. (2016). Interests-in-motion in an informal, media-rich learning setting. *Digital Culture & Education, 8*(1), 1–19.

Hollett, T. S., & Hein, R. (2018). Affective atmospheres and skatepark sessions: The spatiotemporal contours of interest. *Learning, Culture and Social Interaction.* https://doi.org/10.1016/j.lcsi.2018.12.001 Advance online publication.

Holmegaard, H. T., Ulriksen, L. M., & Madsen, L. M. (2015). A narrative approach to understand students' identities and choices. In E. K. Henriksen, J. Dillon, & J. Ryder (Eds.). *Understanding student participation and choice in science and technology education* (pp. 31–42). London: Springer Science + Business Media Education.

Krapp, A. (2002). Structural and dynamic aspects of interest development: Theoretical considerations from an ontogenetic perspective. *Learning and Instruction, 12*(4), 383–409. https://doi.org/10.1016/S0959-4752(01)00011-1.

Larson, R. W., & Verma, S. (1999). How children and adolescents spend time across the world: Work, play, and developmental opportunities. *Psychological Bulletin, 125*(6), 701. https://doi.org/10.1037/0033-2909.125.6.701.

Maxwell, J. A. (2004). Causal explanation, qualitative research, and scientific inquiry in education. *Educational Researcher, 33*(2), 3–11. https://doi.org/10.3102/0013189X033002003.

Neitzel, C. L., Alexander, J. M., & Johnson, K. E. (2019). The emergence of children's interest orientations during early childhood: When predisposition meets opportunity. *Learning, Culture and Social Interaction.* https://doi.org/10.1016/j.lcsi.2019.01.004 Advance online publication.

Nolen, S. B. (2019). Conceptualizing goals in motivation and engagement. In K. A. Renninger, & S. E. Hidi (Eds.). *The Cambridge handbook of motivation and learning* (pp. 547–565). Cambridge, UK: Cambridge University Press.

Prenzel, M. (1992). The selective persistence of interest. In K. A. Renninger, S. E. Hidi, & A. Krapp (Eds.). *The role of interest in learning and development* (pp. 71–98). Hillsdale, NJ: LEA.

Ramey, K. E., & Stevens, R. (2018). Interest development and learning in choice-based, in-school, making activities: The case of a 3D printer. *Learning, Culture and Social Interaction.* https://doi.org/10.1016/j.lcsi.2018.11.009 Advance online publication.

Renninger, K. A. (2000). Individual interest and its implications for understanding intrinsic motivation. In C. Sansone, & J. M. Harackiewicz (Eds.). *Intrinsic and extrinsic motivation: The search for optimal motivation and performance* (pp. 373–404). Academic Press.

Renninger, K. A., & Hidi, S. (2017). *The power of interest for motivation and engagement.* New York: Routledge.

Sansone, C., & Thoman, D. B. (2005). Interest as the missing motivator in self-regulation. *European Psychologist, 10*(3), 175–186. https://doi.org/10.1027/1016-9040.10.3.175.

Schulz, P., Schulte, J., Raube, S., Disouky, H., & Kandler, C. (2018). The role of leisure interest and engagement for subjective well-being. *Journal of Happiness Studies, 19*(4), 1135–1150.

Slot, E. M., Akkerman, S. F., & Wubbels, T. (2019). Adolescents' interest experience in daily life in and across family and peer contexts. *European Journal of Psychology of Education, 34*(1), 25–43. https://doi.org/10.1007/s10212-018-0372-2.

Valsiner, J. (1992). Interest: A metatheoretical perspective. In K. A. Renninger, S. E. Hidi, & A. Krapp (Eds.). *The role of interest in learning and development* (pp. 27–41). Hillsdale, NJ: LEA.

Zittoun, T., Valsiner, J., Vedeler, D., Salgado, J., Goncalves, M. M., & Ferring, D. (2012). *Melodies of living: Human development in the life course.* Cambridge: Cambridge University Press.

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