

## List of Speakers

1. Christoph Hoerl (philosophy and psychology) - relationship between EFT and imagining
2. Jenefer Husman (philosophy and psychology) - individual differences in Future Time Perspective Extension on EFT in adults
3. Que Anh Pham (psychology) - methodology and practice of measuring spontaneous EFT in children
4. Jade Zack (psychology) - importance of measuring temporal order in naturalistic EFT in children

## Overview Abstract

### Title: New Directions in Episodic Future Thinking

Episodic future thinking (EFT) is the ability to simulate oneself in a possible future scenario, which may relate to other future-oriented cognition. For the past 25 years, psychological research on EFT has mainly focused on lab-controlled tasks in which children or adults are told to describe themselves in a possible future event or choose a solution to a future problem. While providing us valuable information on the existence of a general future thinking mechanism, this research has only yielded results of how people use EFT in structured environments and vaguely indicates the type of mental representation an episodic future thought takes. Meanwhile, theories about the true nature of EFT and how it relates to other cognitive abilities have been sparse. We still do not know much about how people engage in EFT in naturalistic contexts (e.g., when somebody *spontaneously* packs extra socks because they know it will rain during their camping trip) or the individual differences that enable one to do so. Just as importantly, the role of EFT and how it interacts with other forms of imagination and future-oriented thinking have not been extensively considered.

Therefore, this symposium brings together philosophical and psychological perspectives to examine what EFT really is, how it operates spontaneously, how it interacts with other forms of imagination and temporal thought, and how it develops across the lifespan. Collectively, the talks challenge reductive views of EFT and highlight its role as a distinct form of future-oriented cognition that supports motivation, self-regulation, and planning.

The first talk opens by theoretically questioning the assumption that EFT can be reduced to imagining an event and placing it in the future. Instead, the speaker will introduce a non-reductive view of EFT, suggesting that simulating a future event is inseparable from understanding the relation between one's present and future self, offering a framework to understand emotional and motivational aspects attributed to EFT.

The second talk continues the philosophical thread by focusing on individual differences in future time perspective extension (FTPE) and how this impacts subsequent engagement in EFT. The speaker will address the history of future thinking research and its lack of consideration of an individual's disposition towards the future, while also laying out the grounds for the future of psychological research in FTP regarding EFT.

The third talk will introduce a specific form of EFT– spontaneous EFT– and discuss the methodological challenges of conducting lab-controlled but naturalistic-oriented experiments to measure this ability in 5-7-year-old children. The speaker will discuss two experiments using iterative task refinements to demonstrate that children’s spontaneous EFT is highly sensitive to motivational structure and constraints of the action space, highlighting the importance of task design.

The fourth talk will focus on implementing some of the previous speaker’s guidelines, testing multi-step spontaneous EFT in 6-9-year-old children. The speaker will emphasize the importance of taking temporal ordering into account when measuring naturalistic EFT, and show that children can exhibit these naturalistic forms of temporally-specific EFT by 7 years of age.

## **Individual Abstracts**

### **Christoph Hoerl**

#### **Episodic future thinking, imagination and time**

What is the relationship between episodic future thinking (EFT), on the one hand, and mere imagining, on the other? The equivalent question about episodic memory – i.e., how it relates to mere imagining – has dominated discussions about memory in both philosophy and psychology. Yet, when it comes to EFT, it is less clear that the question has been viewed as much of an issue. This may be because it is tempting to think that EFT simply consists in imagining an event plus placing it at some point in one’s future, where these are two elements that can be described largely separately from each other. Call this a reductive view of EFT. I will discuss three reasons to look for an alternative to such a view of EFT: (i) studies examining potential benefits specifically of EFT (e.g., as opposed to other forms of imagination-involving or future-oriented cognition) seem to implicitly rely on the assumption that the reductive view is incorrect; (ii) the reductive view arguably runs counter to parallels that have been drawn between EFT and other forms of ‘self-projection’, e.g., in the context of Theory of Mind abilities; (iii) the reductive view makes it difficult to explain the potential emotional consequences that EFT has been credited with. None of these considerations show conclusively that the reductive view is false, but they at least raise the question as to what an alternative, non-reductive, view of EFT might look like. I will offer a sketch of such a non-reductive view. This conceives of EFT as a form of perspective-taking in time, in which the aspect of simulating another perspective is not something that can happen separately from an understanding of the relationship between one’s present perspective and the perspective one simulates.

### **Jenefer Husman**

#### **Future Time Perspective Extension and Episodic Future Thinking: Toward an Integrated Framework**

*Jenefer Husman, Matthew C. Graham, Drew White, Bradley Sullivan, & Dean Livelybrooks*

Research on future thinking has consistently found that the further out into the future a goal is, the less impact that goal will have on a person’s actions in the present. Activation of Episodic

Future Thinking (EFT; the ability to pre-experience specific, vivid possible futures) and Future Time Perspective (FTP; an individual's perception and orientation toward the future) both mitigate the negative effects of temporal distance (Baird et al., 2021; Rösch et al., 2022). A few researchers have examined the intersection of EFT and FTP and have demonstrated that these aspects of future thinking are interrelated, and both influence participants' self-regulation (Gellert et al., 2011; Liu & Feng, 2019). This presentation will discuss an integrated framework that demonstrates the interconnections between research on FTP and EFT, using a mixed-methods study to illustrate potential research directions.

Future Time Perspective has been one of the most researched aspects of human future thinking (Lewin, 1942; Nuttin, 1965; Lens et al., 2012; Husman et al., 2025). In the past two decades, cognitive neuroscience research on the neural similarities between memory and future thinking has opened another area of future thinking: Episodic Future Thinking (Rösch et al., 2022). Future Time Perspective has been examined as an individual difference trait, whereas EFT has been examined as a dynamic cognitive process. The intersection of these two factors has been examined, but the literature remains limited (e.g., Carr et al., 2021; Göllner et al., 2018).

Future Time Perspective is an individual difference variable. Each individual has a different time horizon: moments in time when goals that would be valuable in the short term become less valuable if they occur beyond that temporal boundary. FTP also encompasses the coherence or connectedness of goals within that temporal space. FTP can be conceptualized two-dimensionally as an intersection of connectedness and extension. Individuals with high FTP will see connections between their current actions and future goals. We argue that there is a relation between individuals' episodic future thinking and their Future Time Perspective. Specifically, FTP is related to an individual's ability to engage in EFT (Liu & Feng, 2019).

In addition to presenting an integration of FTP and EFT research, we will report findings from a mixed-methods study examining longitudinal undergraduate students' FTPE and EFT. Drawing on semi-structured life-story interviews, students were asked to narrate key life chapters and to describe a detailed "day in the life" five years in the future. Narratives were analyzed using a multidimensional topographical framework of future time perspective extension (Spence et al., 2022) and coded for episodic future thinking features, including specificity and vividness. Quantitative measures of career commitment, future connectedness, and academic self-efficacy were used to contextualize these narratives. Longitudinal data allow us to examine both stability and change in future thinking within individuals over time, as well as differences across individuals at critical educational transition points. Together, these findings provide a concrete illustration of how FTP extension and episodic future thinking jointly shape motivation and self-regulation.

**Que Anh (Quinn) Pham**

**Challenges of Developing a Spontaneous Episodic Future Thinking Task for Children**

*Que Anh Pham, Candice Koolhaas, & Tashauna Blankenship*

Episodic future thinking (EFT) is the ability to self-project into the future (Atance & Meltzoff, 2005). Tasks studying EFT in children have investigated “cued” rather than “spontaneous” EFT – self-generating a solution to a future problem without environmental cues and verbal prompting. Spontaneous EFT is a better way of evaluating children’s true EFT capacity (Atance et al., 2023); however, there are challenges associated with creating a spontaneous EFT task for children (Pham et al., 2024): How do children know that they have permission to interact with the environment? Will children *want* to interact with the environment without prompting? Will the lack of environmental cues cause confusion? To date, no published empirical task has successfully measured spontaneous EFT. Our task was developed with the goal of examining how to make EFT experiments more spontaneous while considering the aforementioned challenges.

In experiment 1, 60 children (20 5-year-olds, 20 6-year-olds, and 20 7-year-olds) visited the “Dinosaur Room,” where they were shown that a drawing of a triangle made a sticker come out of a Sticker Machine. Then, the experimenter and the child went to the “Polka Dot Room,” where they completed puzzles for 5 minutes. Subsequently, the experimenter gave the child a piece of paper and four differently colored crayons and said “You can do whatever you want now. After this, we will go back to the Dinosaur Room.” Through this design, we had created a mostly unprompted task with limited environmental cues. We found that 17.4% ( $SE=0.08$ ) of 5-year-olds correctly drew the triangle, 18.2% ( $SE=0.08$ ) of 6-year-olds did, and no 7-year-olds did. We suspected that children may not have had an intrinsic goal to retrieve a sticker without an explicit motivational factor and that the ability to draw freely may have been too overwhelming.

Therefore, we ran experiment 2 (ongoing) where we sought to increase children’s motivation by offering them a toy from a treasure chest if they had enough stickers. Furthermore, we constrained the possible drawing space in the Polka Dot Room, where we only gave children one black crayon instead of four colored crayons. Our rationale was that the possible drawing space was too expansive in experiment 1 and that by limiting the drawing utensil to a neutral color, children would be less biased to draw things in their everyday lives. Currently, 7 out of 7 5-year-olds and 2 out of 6 6-year-olds have drawn the correct shape.

Ultimately, results from experiment 2 will allow us to be more certain about the factors impeding children’s spontaneous EFT performance, notably the lack of direction (i.e., from a lack of explicit prompting) causing children to be overwhelmed by the possible actions (i.e., drawing anything they wanted). By the conclusion of the study, we will have a deeper understanding of how to narrow the space of possibilities and increase motivation and goal-directed behavior in a spontaneous EFT task for children.

**Jade Zack**

**The development of temporal ordering for spontaneous episodic future thinking when solving a multi-step future problem in middle childhood**

*Jade Zack, Zsuzsa Kaldy, & Tashauna Blankenship*

Spontaneous episodic future thinking (EFT) is the mental projection of oneself into a future scenario without being explicitly prompted (Atance et al., 2023; Pham et al., 2024). In real life, people often engage in multi-step spontaneous EFT: they simulate the individual steps needed to achieve a future goal and the specific temporal order to take these steps in (for instance, simulating first finding a key that opens a closet and then taking out a coat for an upcoming snowstorm; Martin-Ordas, 2018). However, very few studies have examined the process of completing multiple steps during EFT in children, and none have tested it without prompts. As such, this talk will focus on the importance of taking temporal ordering into account when measuring naturalistic future thinking by highlighting a study that measured children's use of spontaneous EFT to solve a multi-step future problem.

In our computerized task, children had to open a magic box by finding target words and saying them aloud in a specific order. First, children were introduced to the general procedure of choosing objects for the future ("travel phase"; Pham et al., 2024). Next, in a training phase, they learned how to open a box by seeking out "magic" words and saying them in a specific order to receive a prize. Finally, in the test phase, children learned that they needed to find words according to a new rule to open the box. After a delay, they (virtually) went to another room with target and distractor words, as well as distractor activities, and were allowed to act freely. After choosing words, children went back to the first room and were given the chance to open the box. Children's choice of words (target vs. distractor) measured their spontaneous EFT performance, and the order they said the words served as a measure of their temporal order performance.

Currently, 114 children, 27 6-year-olds, 43 7-year-olds, and 44 8-year-olds have participated in this study (final N=138). We found that children's spontaneous EFT performance improved with age ( $p = 0.035$ ,  $OR = 1.043$ , 95% CI [1.004, 1.09]). Follow-up binomial tests showed that while 6-year-olds were at chance level ( $9/27 = 33\%$ ), 7-year-olds ( $22/42 = 51\%$ ) and 8-year-olds ( $27/44 = 61\%$ ) chose the correct words significantly above chance without prompts ( $p < .01$ ). Nonprompted temporal order performance, however, remained significantly above chance levels ( $M = 88\%$ ), regardless of age ( $OR = 1.03$ , 95% CI [0.96, 1.10]) or spontaneous EFT performance ( $OR = 1.44$ , 95% CI [0.39, 5.19]).

As children age into independence, we must understand the intricacies of their real-world planning processes, and this study is a step towards this. Our findings suggest that naturalistic planning (multi-step spontaneous EFT) begins to develop around 6-7 years old and continues to improve with age. These results also suggest that temporal ordering is embedded in- and possibly inseparable from- multi-step future thinking, and therefore, future EFT research must properly take it into account.