



Sources of Information about Episodic Future Thinking

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Abstract

Episodic future thinking is the ability to imagine oneself in a future tense engaging in a specific activity. The selected references explore the role of episodic future thinking in systematically developing specific implementation plans and making deliberate decisions about key life changes. This CASEmaker provides foundational information about episodic future thinking, lists the benefits across various fields of study, and briefly describes how episodic future thinking can apply to early intervention and enhance the work of capacity-building help-givers.

Introduction

Understanding one's current self and the development of a future self has been identified and observed throughout history across various bodies of literature and fields of research (Atance & O'Neill, 2001; Koselleck, 2004; Vance, 2016). For decades, psychologists, researchers, and individuals have sought information to better themselves and aid in achieving goals. Future thinking is often referred to throughout the literature as prospection, envisioning of the future, forward-thinking, and episodic future thinking (Atance & O'Neill, 2001). The study of envisioning or imagining the future self, however, is relatively new (De Brigard et al., 2020; Vance, 2016) and only in more recent years has the idea of prospection become a topic of inquiry (Oettingen et al., 2018). While the impact of episodic future thinking has not been studied or applied to early intervention, the pillars of episodic future thinking directly correlate with early intervention planning, practice, and reflection. This CASEmaker outlines the operational definitions of episodic future thinking and associated vocabulary, provides application in four of the most common areas of study about episodic future thinking, and offers applicability and generalizability to early childhood intervention.

Defining Future Thinking

Most people think about the future with notions ranging from meal planning to selecting a doctor (Atance & O'Neill, 2001; Baumeister et al., 2016; Oettingen et al., 2018). Thinking of oneself in an imagined or envi-

sioned specific event while engaging in a deliberative decision-making process is known as episodic future thinking (Atance & O'Neill, 2001; Koselleck, 2004; Vance, 2016). Episodic future thinking is based on the study of prospection through the lens of human cognition, motivation, and action (Seligman et al., 2013). In deliberative decision-making, the individual recollects past experiences, develops options, and analyzes the outcomes (Glimcher, 2010; Rilling, 2011), thereby promoting problem-solving skills and emotional regulation. This is useful because individuals may begin to ascribe to those future-self characteristics and begin to work towards them (Atance & O'Neill, 2001; Baumeister et al., 2016; Markus & Nurius, 1986), resulting in capacity-building outcomes. This directly parallels with reflection and planning used in early intervention. Additional information about the basis of episodic future thinking can be found in the resources below.

Baumeister, R. F., Vohs, K. D., & Oettingen, G. (2016).

CASEmakers is an electronic publication of the Center for the Advanced Study of Excellence in Early Childhood and Family Support Practices, Family, Infant and Preschool Program, J. Iverson Riddle Developmental Center, Morganton, NC. CASE is an applied research center focusing on the characteristics of evidence-based practices and methods for promoting utilization of practices informed by research.

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Pragmatic prospection: How and why people think about the future. *Review of General Psychology*, 20(1), 3-16. <https://doi.org/10.1037/gpr0000060>

Oettingen, G., Sevincer, A. T., & Gollwitzer P. M. (Eds.). (2018). *The psychology of thinking about the future*. The Guilford Press.

Salgado, S., & Berntsen, D. (2020). My future is brighter than yours: The positivity bias in episodic future thinking and future self-images. *Psychological Research*, 84(7), 1829-1845. <https://doi.org/10.1007/s00426-019-01189-z>

Episodic Memory

The ability to remember personal experiences and then re-experience those events is referred to as episodic memory (Friedman, 2005; Tulving, 2002). An individual's visions of the future evolve from past episodic memories, which help make sense of the past and present (Schacter & Addis, 2007). Episodic memory retrieval is necessary to gather and sort past details and experiences to generate a new, believable future vision (Friedman, 2005; Schacter & Addis, 2007). As opposed to the rote recording of historical events, episodic reconstruction allows for adaptations of future simulations (Schacter & Addis, 2007), thus allowing for envisioning with greater detail, especially for factors such as time, money, and people (Atance & O'Neill, 2001). This envisioned simulation is then recognized as a memory of the future (Ingvar, 1985) and empowers the individual to "re-live" the

event once they experience it in present tense. Memories of the future are specifically helpful for families receiving early intervention services as they reflect upon their own values and goals, and then make and implement plans for achieving their priorities. For more information on episodic memory refer to the references below.

Jeunehomme, O., & D'Argembeau, A. (2021). The role of self-reference and personal goals in the formation of memories of the future. *Memory & Cognition*, 1-17. <https://doi.org/10.3758/s13421-021-01150-9>

Schacter, D. L., & Addis, D. R. (2007). The cognitive neuroscience of constructive memory: Remembering the past and imagining the future. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 362(1481), 773-786. <https://doi.org/10.1098/rstb.2007.2087>

Tulving, E. (2002). Episodic memory: From mind to brain. *Annual Review of Psychology*, 53(1), 1-25. <https://doi.org/10.1146/annurev.psych.53.100901.135114>

The Development of Self

Potential future outcomes change constantly based on past and present experiences and decisions (Hershfield & Bartels, 2018; Ingvar, 1985). As individuals imagine and consider the present-self and future-self concurrently, they reap the benefits of understanding their present state and concrete planning for future decisions (Hershfield & Bartels, 2018; Markus & Nurius, 1986). The evolving future self is a way for individuals to identify and reflect on different elements and roles of their current identity and impart those ideas into future decisions while influencing the current self (Salgado & Bernsten, 2020). In early intervention, evolution of self occurs as families reflect on what they know or have done, generate new ideas, learn additional skills, and make plans for how to continue to support their child's learning and development. For further reading on the development of present, past, and future self, access the resources below.

Ingvar, D. H. (1985). "Memory of the future:" An essay on the temporal organization of conscious awareness. *Human Neurobiology*, 4(3), 127-136.

Hershfield, H. E. & Bartels, D. M. (2018). The future self. In G. Oettingen, A. T. Sevincer, & P. M. Gollwitzer (Eds.), *The psychology of thinking about the future* (pp. 89-109). The Guilford Press.

Salgado, S., & Berntsen, D. (2020). My future is bright-

Rx	Prescription for Practice	Rx
	<p>The prescription for practice lists four references especially important in the ongoing research of episodic future thinking.</p> <p>Atance, C. M., & O'Neill, D. K. (2001). Episodic future thinking. <i>Trends in Cognitive Sciences</i>, 5(12), 533-539. https://doi.org/10.1016/s1364-6613(00)01804-0</p> <p>Baumeister, R. F., Vohs, K. D., & Oettingen, G. (2016). Pragmatic prospection: How and why people think about the future. <i>Review of General Psychology</i>, 20(1), 3-16. https://doi.org/10.1037/gpr0000060</p> <p>Friedman, W. J. (2005). Developmental and cognitive perspectives on humans' sense of the times of past and future events. <i>Learning and Motivation</i>, 36(2), 145-158. https://doi.org/10.1016/j.lmot.2005.02.005</p> <p>Oettingen, G., Sevincer, A. T., & Gollwitzer P. M. (Eds.). (2018). <i>The psychology of thinking about the future</i>. The Guilford Press.</p>	

er than yours: The positivity bias in episodic future thinking and future self-images. *Psychological Research*, 84(7), 1829-1845. <https://doi.org/10.1007/s00426-019-01189-z>

The Power of Planning

By envisioning or making a plan, the brain is physiologically engaged (Stuifbergen et al., 2003) and reaps the chemically-laced benefits (i.e. dopamine) even if the plan is not executed (Breuning, 2016). Dopamine then helps materialize the memories by creating context-rich details and enabling clear recall (Brewer, 2017). The chemical impact is more profound when the plans are chosen by the individual (Cole et al., 2013) than when the plan is a directive or imposed upon the individual by an outside source. By pre-experiencing an event, an individual can process the emotions associated with the event and plan accordingly while reaping the chemical benefits of action planning. To find out more about the brain benefits of future thinking, access these references.

- Atance, C. M., & O'Neill, D. K. (2001). Episodic future thinking. *Trends in Cognitive Sciences*, 5(12), 533-539. [https://doi.org/10.1016/s1364-6613\(00\)01804-0](https://doi.org/10.1016/s1364-6613(00)01804-0)
- Breuning, L. G. (2016). *Habits of a happy brain: Retrain your brain to boost your serotonin, dopamine, oxytocin, & endorphin levels*. Simon and Schuster.
- Brewer, J. (2017). *The craving mind: From cigarettes to smartphones to love? Why we get hooked and how we can break bad habits*. Yale University Press.

Application of Episodic Future Thinking

Although not yet in early intervention and family-support literature, episodic future thinking can be found in various fields of research such as education, nutrition, substance use, and mental health (Brown et al., 2013; Brown et al, 2016; Hollis-Hansen et al., 2019; Stein et al., 2017; Wu et al., 2015). Episodic future thinking holds promise for implementation in early intervention as it directly correlates to many components of early intervention (i.e., planning, action/practice, feedback, reflection, and responsiveness). Episodic future thinking is also an effective way to shape individuals' engagement of the future while promoting forward-thinking and delayed discounting. Delayed discounting can be summarized as a willingness to delay a reward in exchange for a different, often long-term, reward that better aligns with one's values and beliefs (Odum, 2011). Episodic future

thinking engages the brain to account for value attribution of goals and rewards.

Educational Application

The use of episodic future thinking and the potential outcome in education continue to be explored for students of all ages. Research shows the use of episodic future thinking can increase study time for students, reduce delay discounting, decrease impulsive behavior, and improve decision-making (Bromberg et al., 2017; O'Donnell et al., 2017). The below references provide a deeper understanding of studies relevant to learning and an educational application of episodic future thinking.

- Bromberg, U., Lobatcheva, M., & Peters, J. (2017). Episodic future thinking reduces temporal discounting in healthy adolescents. *PLOSE ONE*, 12(11), Article e0188079. <https://doi.org/10.1371/journal.pone.0188079>
- De Brigard, F., Gessell, B., Yang, B. W., Stewart, G., & Marsh, E. J. (2020). Remembering possible times: Memory for details of past, future, and counterfactual simulations. *Psychology of Consciousness: Theory, Research, and Practice*, 7(4), 331-339. <https://doi.org/10.1037/cns0000220>
- O'Donnell, S., Daniel, T. O., & Epstein, L. H. (2017). Does goal relevant episodic future thinking amplify the effect on delay discounting? *Consciousness and Cognition*, 51, 10-16. <https://doi.org/10.1016/j.con-cog.2017.02.014>
- Suddendorf, T., & Busby, J. (2005). Making decisions with the future in mind: Developmental and comparative identification of mental time travel. *Learning and Motivation*, 36(2), 110-125. <https://doi.org/10.1016/j.lmot.2005.02.010>
- Wu, W. H., Cheng, W., & Chiou, W. B. (2017). Episodic future thinking about the ideal self induces lower discounting, leading to a decreased tendency toward cheating. *Frontiers in Psychology*, 8, Article 287. <https://doi.org/10.3389/fpsyg.2017.00287>

Nutritional Application

Episodic future thinking is a viable intervention to address unhealthy food choices. When used in studies, it successfully reduced overeating (Hollis-Hansen et al., 2019; Stein et al., 2017), decreased caloric intake, and increased healthier food selections (Hollis-Hansen et al., 2019; Stein et al., 2017). Overall, episodic future thinking is a successful intervention in modifying eating hab-

its and improving food choices. The below references provide further insight into the nutritional application of episodic future thinking.

- Hollis-Hansen, K., Seidman, J., O'Donnell, S., & Epstein, L. H. (2019). Episodic future thinking and grocery shopping online. *Appetite, 133*, 1-9. <https://doi.org/10.1016/j.appet.2018.10.019>
- Stein, J. S., Sze, Y. Y., Athamneh, L., Koffarnus, M. N., Epstein, L. H., & Bickel, W. K. (2017). Think fast: Rapid assessment of the effects of episodic future thinking on delay discounting in overweight/obese participants. *Journal of Behavioral Medicine, 40*(5), 832-838. <https://doi.org/10.1007/s10865-017-9857-8>
- Stuifbergen, A. K., Becker, H., Timmerman, G. M., & Kullberg, V. (2003). The use of individualized goal setting to facilitate behavior change in women with multiple sclerosis. *Journal of Neuroscience Nursing, 35*(2), 94-101. <https://doi.org/10.1097/01376517-200304000-00005>

Substance Use Application

Episodic future thinking is also used to support remission and recovery from substance use, including alcohol and tobacco, and successfully reduces delay discounting (Wang et al., 2019; Stein et al., 2016). While historically used as part of the interview method in treatment, episodic future thinking is forging ahead by integrating virtual reality as a new modality for remission and recovery. Virtual reality is an alternative that provides an immersive environment allowing individuals to experience real-life situations and potential substance devaluation to treat addiction (Wang et al., 2019). Combining virtual reality and episodic future thinking has been proven efficient in reducing impulsive behaviors in multiple adult samplings (Bromberg et al., 2017). By providing an opportunity for mental rehearsal, individuals are more likely to engage in a similar way outside the intervention. The following references provide information about specific studies and broad integration of episodic future thinking principles in the field of substance use.

- Parnell, L. (2019). *Rewiring the addicted brain with EM-DR-based treatment*. W. W. Norton, Incorporated.
- Snider, S. E., Deshpande, H. U., Lisinski, J. M., Koffarnus, M. N., LaConte, S. M., & Bickel, W. K. (2018). Working memory training improves alcohol users' episodic future thinking: A rate-dependent

analysis. *Biological Psychiatry: Cognitive Neuroscience and Neuroimaging, 3*(2), 160-167. <https://doi.org/10.1016/j.bpsc.2017.11.002>

- Stein, J. S., Wilson, A. G., Koffarnus, M. N., Daniel, T. O., Epstein, L. H., & Bickel, W. K. (2016). Unstuck in time: Episodic future thinking reduces delay discounting and cigarette smoking. *Psychopharmacology, 233*(21), 3771-3778. <https://doi.org/10.1007/s00213-016-4410-y>
- Voss, A. T., Jorgensen, M. K., & Murphy, J. G. (2021). Episodic future thinking as a brief alcohol intervention for heavy drinking college students: A pilot feasibility study. *Experimental and Clinical Psychopharmacology*. Advance online publication. <https://doi.org/10.1037/pha0000451>
- Wang, T., Mellis, A. M., Lau, N., & Bickel, W. (2019, November). Integrating episodic future thinking into virtual reality to mitigate substance use disorders: A theoretical framework. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* (Vol. 63, No. 1, pp. 2282-2286). SAGE Publications. <https://doi.org/10.1177/1071181319631026>

Mental Health Application

Episodic future thinking is used as an intervention for various mental health concerns, including generalized anxiety disorder, to develop positive thoughts through detailed, descriptive future ideations. (Wu et al., 2015). Additionally, it is used in the treatment of post-traumatic stress disorder. Post-traumatic stress disorder, specifically in the military, often renders individuals with a reduction of episodic memory and leaves them hyper-aware of future harm and feelings of continual distress as a result. By improving self-efficacy via episodic future thinking, individuals may evolve their view of the future and their ability to navigate and control upcoming situations (Brown et al., 2013; Brown et al, 2016). Review the references below for specific studies about the application of episodic future thinking in mental health.

- Brown, A. D., Kouri, N. A., Rahman, N., Joscelyne, A., Bryant, R. A., & Marmar, C. R. (2016). Enhancing self-efficacy improves episodic future thinking and social-decision making in combat veterans with posttraumatic stress disorder. *Psychiatry Research, 242*, 19-25. <https://doi.org/10.1016/j.psychres.2016.05.026>
- Brown, A. D., Root, J. C., Romano, T. A., Chang, L. J., Bryant, R. A., & Hirst, W. (2013). Overgeneralized autobiographical memory and future thinking in

combat veterans with posttraumatic stress disorder. *Journal of Behavior Therapy and Experimental Psychiatry*, 44(1), 129-134. <https://doi.org/10.1016/j.jbtep.2011.11.004>

Salgado, S., & Berntsen, D. (2020). My future is brighter than yours: The positivity bias in episodic future thinking and future self-images. *Psychological Research*, 84(7), 1829-1845. <https://doi.org/10.1007/s00426-019-01189-z>

Wu, J. Q., Szpunar, K. K., Godovich, S. A., Schacter, D. L., & Hofmann, S. G. (2015). Episodic future thinking in generalized anxiety disorder. *Journal of Anxiety Disorders*, 36, 1-8. <https://doi.org/10.1016/j.janxdis.2015.09.005>

Conclusion

This CASEmaker presents information about imagining oneself in the future and the power of deliberative decision-making. By engaging in a planning or envisioning process, individuals reap the chemical benefits associated with engagement or completion. By identifying attributes found in the current self, desired attributes, and specific goals, individuals are better equipped to engage the present and make decisions for the future. Early intervention practitioners, among others, can utilize episodic future thinking to support families in the pursuit of their priorities and goals. By creating a mental space for families to imagine and plan their futures (short-term and long-term) based on their own values and beliefs, families can reap the chemical benefits of episodic future thinking while creating new brain infrastructure that has the potential to last well beyond the time of early intervention.

References

Atance, C. M., & O'Neill, D. K. (2001). Episodic future thinking. *Trends in Cognitive Sciences*, 5(12), 533-539. [https://doi.org/10.1016/s1364-6613\(00\)01804-0](https://doi.org/10.1016/s1364-6613(00)01804-0)

Baumeister, R. F., Vohs, K. D., & Oettingen, G. (2016). Pragmatic prospection: How and why people think about the future. *Review of General Psychology*, 20(1), 3-16. <https://doi.org/10.1037/gpr0000060>

Breuning, L. G. (2016). *Habits of a happy brain: Retrain your brain to boost your serotonin, dopamine, oxytocin, & endorphin levels*. Simon and Schuster.

Brewer, J. (2017). *The craving mind: From cigarettes to smartphones to love? Why we get hooked and how we can break bad habits*. Yale University Press.

Bromberg, U., Lobatcheva, M., & Peters, J. (2017). Episodic future thinking reduces temporal discounting in healthy adolescents. *PLOSE ONE*, 12(11), Article e0188079. <https://doi.org/10.1371/journal.pone.0188079>

Brown, A. D., Kouri, N. A., Rahman, N., Joscelyne, A., Bryant, R. A., & Marmar, C. R. (2016). Enhancing self-efficacy improves episodic future thinking and social-decision making in combat veterans with posttraumatic stress disorder. *Psychiatry Research*, 242, 19-25. <https://doi.org/10.1016/j.psychres.2016.05.026>

Brown, A. D., Root, J. C., Romano, T. A., Chang, L. J., Bryant, R. A., & Hirst, W. (2013). Overgeneralized autobiographical memory and future thinking in combat veterans with posttraumatic stress disorder. *Journal of Behavior Therapy and Experimental Psychiatry*, 44(1), 129-134. <https://doi.org/10.1016/j.jbtep.2011.11.004>

Cole, S., Balcetis, E., & Zhang, S. (2013). Visual perception and regulatory conflict: Motivation and physiology influence distance perception. *Journal of Experimental Psychology: General*, 142(1), 18. <https://doi.org/10.1037/a0027882>

De Brigard, F., Gessell, B., Yang, B. W., Stewart, G., & Marsh, E. J. (2020). Remembering possible times: Memory for details of past, future, and counterfactual simulations. *Psychology of Consciousness: Theory, Research, and Practice*, 7(4), 331-339. <https://doi.org/10.1037/cns0000220>

Friedman, W. J. (2005). Developmental and cognitive perspectives on humans' sense of the times of past and future events. *Learning and Motivation*, 36(2), 145-158. <https://doi.org/10.1016/j.lmot.2005.02.005>

Glimcher, P. (2010). *Decisions, uncertainty, and the brain: The science of neuroeconomics*. MIT Press.

Hershfield, H. E. & Bartels, D. M. (2018). The future self. In G. Oettingen, A. T. Sevincer, & P. M. Gollwitzer (Eds.), *The psychology of thinking about the future* (pp. 89-109). The Guilford Press.

Hollis-Hansen, K., Seidman, J., O'Donnell, S., & Epstein, L. H. (2019). Episodic future thinking and grocery shopping online. *Appetite*, 133, 1-9. <https://doi.org/10.1016/j.appet.2018.10.019>

Ingvar, D. H. (1985). "Memory of the future:" An essay on the temporal organization of conscious awareness. *Human Neurobiology*, 4(3), 127-136.

Koselleck, R. (2004). *Futures past: On the semantics of historical time* (K. Tribe, Trans.). Columbia University Press. (Original work published 1985)

- Markus, H., & Nurius, P. (1986). Possible selves. *American Psychologist*, *41*(9), 954-969. <https://doi.org/10.1037/0003-066X.41.9.954>
- O'Donnell, S., Daniel, T. O., & Epstein, L. H. (2017). Does goal relevant episodic future thinking amplify the effect on delay discounting? *Consciousness and Cognition*, *51*, 10-16. <https://doi.org/10.1016/j.concog.2017.02.014>
- Odum, A. L. (2011). Delay discounting: I'm a k, you're a k. *Journal of the Experimental Analysis of Behavior*, *96*(3), 427-439. <https://doi.org/10.1901/jeab.2011.96-423>
- Oettingen, G., Sevincer, A. T., & Gollwitzer P. M. (Eds.). (2018). *The psychology of thinking about the future*. The Guilford Press.
- Rilling, J. (2011). The neuroscience of social decision making. *Annual Review of Psychology*, *62*(1), 23-48. <https://www.annualreviews.org/doi/10.1146/annurev.psych.121208.131647>
- Salgado, S., & Berntsen, D. (2020). My future is brighter than yours: The positivity bias in episodic future thinking and future self-images. *Psychological Research*, *84*(7), 1829-1845. <https://doi.org/10.1007/s00426-019-01189-z>
- Schacter, D. L., & Addis, D. R. (2007). The cognitive neuroscience of constructive memory: Remembering the past and imagining the future. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *362*(1481), 773-786. <https://doi.org/10.1098/rstb.2007.2087>
- Seligman, M. E., Railton, P., Baumeister, R. F., & Sripada, C. (2013). Navigating into the future or driven by the past. *Perspectives on Psychological Science*, *8*(2), 119-141. <https://doi.org/10.1177/1745691612474317>
- Stein, J. S., Sze, Y. Y., Athamneh, L., Koffarnus, M. N., Epstein, L. H., & Bickel, W. K. (2017). Think fast: Rapid assessment of the effects of episodic future thinking on delay discounting in overweight/obese participants. *Journal of Behavioral Medicine*, *40*(5), 832-838. <https://doi.org/10.1007/s10865-017-9857-8>
- Stein, J. S., Wilson, A. G., Koffarnus, M. N., Daniel, T. O., Epstein, L. H., & Bickel, W. K. (2016). Unstuck in time: Episodic future thinking reduces delay discounting and cigarette smoking. *Psychopharmacology*, *233*(21), 3771-3778. <https://doi.org/10.1007/s00213-016-4410-y>
- Stuijbergen, A. K., Becker, H., Blozis, S., Timmerman, G., & Kullberg, V. (2003). A randomized clinical trial of a wellness intervention for women with multiple sclerosis. *Archives of Physical Medicine and Rehabilitation*, *84*(4), 467-476. <https://doi.org/10.1053/apmr.2003.50028>
- Tulving, E. (2002). Episodic memory: From mind to brain. *Annual Review of Psychology*, *53*(1), 1-25. <https://doi.org/10.1146/annurev.psych.53.100901.135114>
- Vance, E. (2016). *Suggestible you: The curious science of your brain's ability to deceive, transform, and heal*. National Geographic Books.
- Wang, T., Mellis, A. M., Lau, N., & Bickel, W. (2019, November). Integrating episodic future thinking into virtual reality to mitigate substance use disorders: A theoretical framework. In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting* (Vol. 63, No. 1, pp. 2282-2286). SAGE Publications. <https://doi.org/10.1177/1071181319631026>
- Wu, J. Q., Szpunar, K. K., Godovich, S. A., Schacter, D. L., & Hofmann, S. G. (2015). Episodic future thinking in generalized anxiety disorder. *Journal of Anxiety Disorders*, *36*, 1-8. <https://doi.org/10.1016/j.janxdis.2015.09.005>

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