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Personal narrative and stream of consciousness: an AI approach

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ABSTRACT

The personal narrative is a construct said to embody personal identity and so influence thought and guide behavior. Therapists and coaches draw on such personal narratives to explain maladaptive thoughts and to foster clients' insights. We combined artificial intelligence (AI) with stream-of-consciousness to make the latent construct of personal narrative explicit. Adult participants ($n = 26$) contributed 50 stream-of-consciousness thoughts, which along with demographic details and our prompts, were processed by ChatGPT-4 to create a personal narrative. Participants evaluated these AI-generated narratives for accuracy, surprise, and insightfulness, reporting high accuracy, surprise, and increased self-insight. Twenty-five of the 26 participants rated the narratives as 'Completely Accurate' or 'Mostly Accurate', 19 rated the narratives as 'Very Surprising' or 'Somewhat Surprising', and 19 indicated that they learned something new about themselves. This suggests that AI can support self-discovery in therapy and coaching.

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Artificial intelligence;
personal narrative; coaching;
therapy

Personal narratives – the stories we tell ourselves about our lives – may play a central role in identity and so influence our thought patterns and behaviors. This role of personal narratives has been a central theme in psychological theories including McAdams's (1985) life story model of identity and Habermas and Bluck's (2000) theory of autobiographical reasoning. These theoretical frameworks and decades of empirical research posit that personal narratives help individuals make sense of past experiences, perceive the present, and envision their future (Adler et al., 2016, Habermas & Köber, 2015, McAdams, 1985, 2008, 2018, Singer, 2004). As such, they are not just random stories, but a key component of human cognition.

The notion of personal narrative has taken hold in psychotherapy and coaching, too. Research in cognitive behavioral therapy and narrative therapy suggests that by helping individuals reinterpret their personal narratives, therapists can promote self-understanding leading toward healthier thought and action. Despite such benefits, working with personal narratives poses a unique challenge due to their inherent subjectivity, and latent, rather than explicit, structure.

Artificial intelligence

Despite the rise in artificial intelligence (AI) today, research and application within psychology are still developing in simulating human perception, self-knowledge, emotions,

intentions, and desires (Zhao et al., 2022). Yet, its rapid advance offers a promising new avenue for the study of personal narratives.

To date, psychology has leveraged AI technology for evaluating psychological interventions, predicting clinical diagnoses, and recognizing affective states based on facial expressions (Zhao et al., 2022, Zhou et al., 2022). More recently, developments of large language models (LLMs) enable social science researchers to accurately simulate human behavioral responses and analyze complex relationships within language on a much greater scale than ever before (Grossmann et al., 2023).

AI's capabilities enable pattern recognition of latent variables and thus make it a potent tool for studying personal narratives. By mining data for patterns, AI might make personal narratives explicit thereby streamlining their use in therapy or coaching. However, this path, to our knowledge, is yet to be walked.

Present study

We aimed to use AI to generate personal narratives from stream-of-consciousness data. We prompted ChatGPT-4 to process participant data and to generate individualized, personal narratives, which participants then evaluated for accuracy, surprise, and insight. By examining the capacity of AI to create meaningful personal narratives and to evaluate the impact of these narratives on our participants, we explored a new frontier at the

intersection of psychology and AI. Our research advances the exploration of AI's potential in psychological practice.

Method

Research participants

The participants, all aged 18 and above, were recruited via multiple methods. Students from the University of Pennsylvania volunteered through an online research portal offering research credits. All other participants were recruited via study advertising on authentichappiness.org.

Procedure

Each participant provided informed and explicit consent before first completing a demographic questionnaire in Qualtrics. Upon completion of this first survey, each participant received an email with detailed instructions to record 50 stream-of-consciousness thoughts over the course of 48 hours and upload the document to a secure cloud folder. We then gave a series of structured prompts to train ChatGPT-4 to generate a detailed, personal narrative for each participant. Once narratives were generated, additional prompts were then used in a new ChatGPT-4 session to 'back-translate' the narratives and produce 25 stream-of-consciousness thoughts that the individual, described in the generated narrative, might think. The prompt scripts used to generate the narratives and thoughts are included in Table 2.

We then put each participant's AI-generated narrative and AI-generated stream-of-consciousness thoughts into an individualized Qualtrics survey that was sent only to that participant. These second surveys asked each participant to rate the accuracy, surprisingness, and insightfulness of both the generated narrative and the AI-generated stream-of-consciousness thoughts. Participants were also invited to open-ended comment on the accuracy and insightfulness of these narratives.

Measures

The demographic questionnaire asked about age, gender, marital status and children, race, ethnicity, sexuality, education, employment, income, and religious beliefs.

In the second survey we asked individuals three questions to rate their AI-generated personal narrative: (1) 'Overall, how accurate is this personal narrative?' on a 5-point scale ranging from 1 – 'Completely Inaccurate (this narrative sounds nothing like me') to 5 – 'Completely Accurate (this narrative is a near perfect representation of me'); (2) 'How surprising was this narrative to you?' on a 5-

Table 1. Sociodemographic characteristics of participants.

Characteristics	n	%
Gender		
Female	21	80.8
Male	5	19.2
Non-binary/third gender	0	0
Race and Ethnicity		
American Indian or Alaska Native	0	0
Asian	10	38.5
Black or African American	2	7.7
Native Hawaiian/Pacific Islander	0	0
White	12	46.2
Mixed Race	2	7.7
Hispanic or Latinx	1	3.8
Non-Hispanic or Latinx	25	96.2
Relationship Status		
Single (never married)	12	46.2
Married/partnered	10	38.5
Dating	4	15.4
Separated	0	0
Divorced/Widowed	0	0
Children ^a	8	30.8
Sexuality		
Asexual	0	0
Straight (heterosexual)	22	84.6
Gay or Lesbian	0	0
Bisexual	1	3.8
Pansexual	1	3.8
Questioning or unsure	1	3.8
Prefer not to say	1	3.8
Highest educational level		
Less than high school diploma	0	0
High school degree/Some college	15	57.7
Bachelor's degree (e.g. BA, BS)	7	26.9
Master's degree (e.g. MA, MS, MEd)	3	11.5
Professional degree (e.g. MD, DDS)	1	3.8
Doctorate (e.g. PhD, EdD)	0	0
Employment		
Employed full-time (40+ hrs/week)	7	26.9
Employed part-time	0	0
Student	14	53.8
Self-employed	1	3.8
Homemaker	2	7.7
Retired	0	0
Unemployed	2	7.7
Annual Household Income		
Less than \$20,000	7	26.9
\$20,000–\$34,999	3	11.5
\$35,000–\$49,999	1	3.8
\$50,000–\$74,999	1	3.8
\$75,000–\$99,999	3	11.5
\$100,000–\$499,999	8	30.8
\$500,000+	3	11.5
Religious Beliefs		
Christian	7	26.9
Mormon	1	3.8
Jewish	1	3.8
Muslim	2	7.7
Buddhist	0	0
Hindu	3	11.5
Atheist	2	7.7
Agnostic	1	3.8
Nothing in particular	6	23.1
Something else	1	3.8

N = 26. Participants were on average 31 years old ($SD = 15.5$).

^aReflects the number and percentage of participants answering 'yes' to this question.

point scale ranging from 1 – 'Very unsurprising' to 5 – 'Very surprising'; and (3) 'Did you learn something new about yourself or were you made aware of something about

Table 2. ChatGPT-4 prompts.

Generated Narrative Script	Generated Streams-of-Consciousness Script
(1) Can you tell me what you know about the psychological definition of 'stream of consciousness'?	(1) Can you tell me what you know about personal narratives in psychology?
(2) You seem to understand it well. Stream-of-consciousness describes the flow of seemingly automatic thoughts that an individual is aware of before those thoughts have been edited down into narrative coherence or sense. I am going to share the stream-of-consciousness thoughts of a {AGE}, {RACE}, {SEXUALITY}, {GENDER} from {PLACE OF ORIGIN}. {HE/SHE/ THEY} is currently {RELATIONSHIP STATUS} with {X CHILDREN}.* {HE/SHE/ THEY} is {EMPLOYMENT STATUS} now and {HIS/HER/ THEIR} gross annual household income is {INCOME RANGE}. I want you to help me identify psychological patterns and themes based on {HIS/HER/ THEIR} stream-of-consciousness thoughts. I'm wondering if you're in a position to teach me something about {HIM/ HER/ THEM}. Here are {HIS/HER/ THEIR} thoughts: {INSERT PARTICIPANT'S RECORDED THOUGHTS}	(2) You seem to have a decent understanding of personal narratives in psychology. For added context, the concept of personal narratives is based on the idea that beginning in adolescence, people start to become historians of the self. People begin to see their past as something that they can make meaning out of, and reconstruct it in a way that helps them understand themselves, the world around them, and where they may be going in the future. Now, can you tell me what you understand about stream-of-consciousness thoughts in psychology?
(3) This is a good start. Now, I'm wondering how {HIS/HER/ THEIR} thoughts relate to {HIS/HER/ THEIR} personal narrative or {HIS/HER/ THEIR} life story. People are natural storytellers and tell stories or construct narratives about their own personal histories and lives, which often include their thoughts, feelings, experiences, and beliefs. Based on {HIS/HER/ THEIR} stream of consciousness, I'm hoping you can try to infer {HIS/HER/ THEIR} personal narrative. Before you do that, can you reiterate to me how you're understanding the concept of personal narrative? I want to make sure we're understanding each other.	(3) This is a good general understanding of stream-of-consciousness. I am interested in stream of consciousness as it relates to Psychology. Now I going to give you the detailed personal narrative of {AGE}, {RACE}, {SEXUALITY}, {GENDER} from {PLACE OF ORIGIN}. {HE/SHE/ THEY} is currently {RELATIONSHIP STATUS} with {X CHILDREN}. {HE/SHE/ THEY} is {EMPLOYMENT STATUS} now and {HIS/HER/ THEIR} gross annual household income is {INCOME RANGE}. I'm wondering if you're in a position to teach me something about {HIM/HER/ THEM}. I want you to help me understand {HIS/HER/ THEIR} stream-of-consciousness. Can you generate 25 stream-of-consciousness thoughts that this person might think naturally throughout the day based on {HIS/HER/ THEIR} following personal narrative?: {INSERT AI-GENERATED PERSONAL NARRATIVE}
(4) It sounds like you understand the idea of the personal narrative. For added context, the concept of personal narratives is based on the idea that beginning in adolescence, people start to become historians of the self. People begin to see their past as something that they can make meaning out of, and reconstruct it in a way that helps them understand themselves, the world around them, and where they may be going in the future. You seem to have a firm grasp of this idea in your account of personal narratives. Now, can you try to generate this person's detailed personal narrative based on the stream-of-consciousness thoughts that I shared with you above?	
(5) This is a good start. Now I'm wondering if you can make additional inferences about this individual's life up until this point and generate a very detailed, highly accurate personal narrative in paragraph form based on all of the information provided to you.	

Note: For each participant, the prompts were run in two separate chat sessions (one for the narrative, and one for the generated 25 thoughts).

*Used when applicable.

yourself after reading this narrative?' with responses, 'Yes' or 'No'. Additionally, we invited participants to answer two open-ended questions: (1) What elements or aspects of this AI-generated narrative were inaccurate or missing from the life story or personal narrative that you believe you have?; and (2) 'Please explain in a few words or sentences what you learned'. In this same survey, these questions were repeated for the 25 AI-generated stream-of-consciousness thoughts.

Although this was a convenience sample, 95 individuals, from 20 different countries completed the first survey, and approximately 33% ($n = 31$) of those individuals reported their stream-of-consciousness thoughts and therefore moved to the second stage. Of those 31 individuals, 26 completed the study. At this point, results were consistent, so we discontinued data collection. Of this final group ($n = 26$), the ages ranged from 18–79 years old and their mean age was 31 years old. Additional sociodemographic characteristics are presented in Table 1.

Results

The great majority, 96% ($n = 25$), rated the AI-generated personal narratives as either 'Completely Accurate' or 'Mostly Accurate'. 73% ($n = 19$) rated the narratives as 'Very Surprising' or 'Somewhat Surprising', and 73% also ($n = 19$) indicated that they learned something about themselves from the narratives. Figure 1 shows these ratings.

For the reverse procedure, in which we prompted AI with the personal narrative and asked it to generate 25 stream-of-consciousness thoughts, 14 out of 26 of the participants rated these thoughts as either 'Completely Accurate' or 'Mostly Accurate', while 46% ($n = 12$) rated them as 'Somewhat accurate/inaccurate' or 'Mostly Inaccurate'. Sixty-two percent of participants rated these thoughts as 'Very Surprising' or 'Somewhat Surprising'; 23% rated them as 'Neither Surprising nor Unsurprising'; and 15% rated them as 'Somewhat Unsurprising' or 'Very Unsurprising'. Finally, 54% ($n = 14$) of participants reported learning something

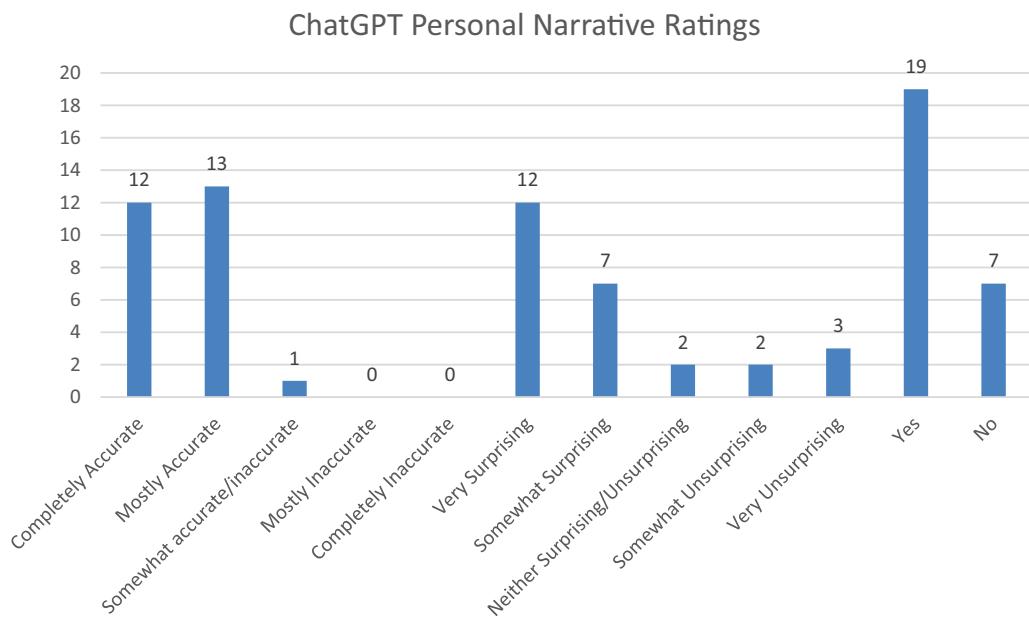


Figure 1. Participant ratings of accuracy, surprise, and insight of the individual AI-generated personal narratives as a function of the degree of accuracy, surprise, and insight and the number of participants in each rating category.

about themselves from these AI-generated thoughts, while 46% ($n=12$) did not. These results are shown in **Figures 1 and 2** and further summarized in **Table 3**. In addition, we included samples of participant's open-ended responses commenting on the accuracy of the personal narratives and what they learned from the AI-generated streams-of-consciousness in **Table 4**.

Discussion

We found that ChatGPT-4 generated accurate personal narratives when prompted with participants' stream-of-consciousness thoughts and basic demographic information. Most participants also reported being surprised by these narratives, indicating that this AI model drew out patterns from the data that had previously gone unnoticed

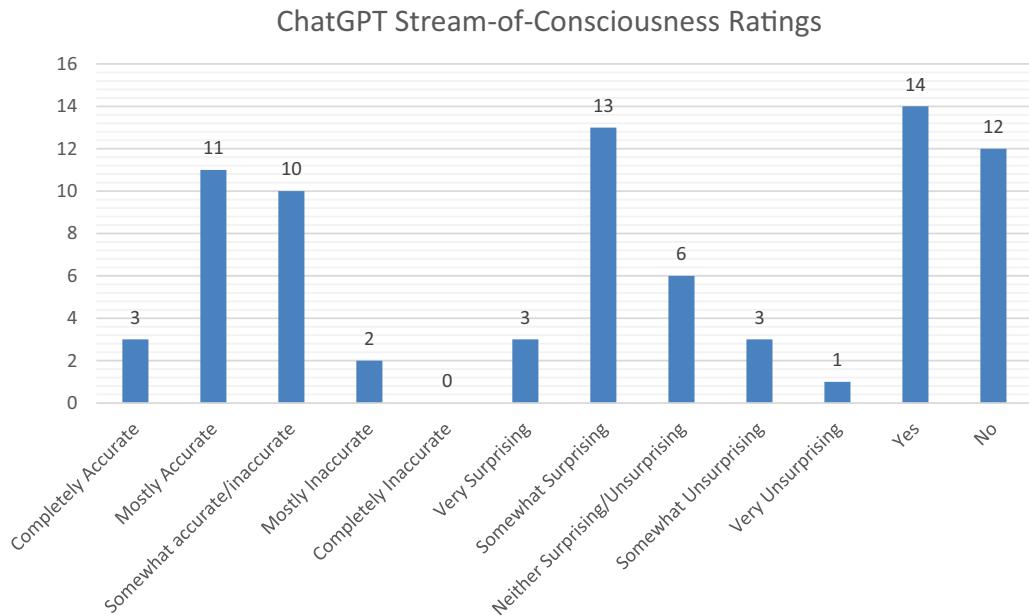


Figure 2. Participant ratings of accuracy, surprise, and insight of the individual AI-generated stream-of-consciousness thoughts as a function of the degree of accuracy, surprise, and insight and the number of participants in each rating category.

Table 3. Descriptive statistics for study variables.

AI-Generated Variables Ratings	<i>n</i>	<i>M</i> (out of 5)	<i>SD</i>	Scale
1. Narrative Accuracy ^a	26	4.42	.58	1–5
2. Narrative Surprise ^b	26	3.88	1.40	1–5
3. Narrative Insight ^c	26	0.73*	0.45	0–1
4. Stream-of-Consciousness Accuracy ^a	26	3.58	.81	1–5
5. Stream-of-Consciousness Surprise ^b	26	3.54	.99	1–5
6. Stream-of-Consciousness Insight ^c	26	.54*	0.51	0–1

^aAccuracy Scales: 1 = Completely Inaccurate; 5 = Completely Accurate.^bSurprise Scales: 1 = Very Unsurprising; 5 = Very Surprising.^cInsight Scales: 1 = Yes; 0 = No.

*Out of 2 instead of 5.

Table 4. Narrative examples and participant open-ended responses

Narratives Rated: Completely Accurate, Very Surprising, Insight Gained

Narrative Sample 1

Our narrative unfolds with a young, straight, white, Muslim woman from Turkey. As a dedicated student pursuing her master's degree, she has always been disciplined and committed to her studies. Her commitment to her academic career reveals an ambitious spirit and a yearning for personal growth. However, recently, she has been struggling with maintaining her motivation and concentration. The woman who never used to procrastinate finds herself succumbing to it, signifying that she is in a particularly challenging phase of her life. Simultaneously, she is navigating her way through a romantic transition. She's engaged and eagerly waiting to marry her fiancé, whom she is deeply in love with. The prospect of her wedding, of starting a new life with her partner, fills her with excitement and anticipation. However, this impending transition also brings along a wave of anxieties, particularly around financial stability. The fear of being a burden on her family tugs at her heart, revealing her considerate nature and the weight of responsibility she feels. Her family is a significant part of her life. Her protective and caring instincts shine through when she worries about her sister's high school entrance exam. But her relationship with her family, particularly her father, is not without its challenges. His drinking habits cause her distress and anger, which sometimes leave her feeling lonely and resentful. Despite these struggles, she also experiences moments of peace, happiness, and connection with her family, speaking to the resilience and complexity of these bonds. On the emotional front, she rides a rollercoaster of feelings. She feels irritation, resentment, loneliness, and sadness, especially when personal problems intrude on her academic and professional life. Her worries about her family's future and her career occasionally lead her into bouts of hopelessness. Yet, in the midst of these turbulent emotions, she also finds moments of joy, healing, and hope, especially when she contemplates her upcoming wedding. Her social life seems to be a source of reprieve and joy for her. She enjoys socializing and being helpful to others. Even when she feels physically tired, she finds satisfaction in her bustling social life, indicating her resilient spirit and her ability to find joy in interpersonal relationships. In sum, this narrative paints the portrait of a young woman in transition, grappling with academic pressures, financial worries, familial dynamics, and the anticipation of her wedding. Despite the challenges she faces, she navigates her journey with resilience, maintaining a balance between her academic pursuits, personal life, and her hopes for the future. (Kara, Age 23)

Narrative Sample 2

Born and raised in Peru, this woman was introduced to the intertwined threads of faith, resilience, and love from an early age. As a mixed-race child in a deeply Roman Catholic family, she learned the significance of embracing diversity and developed a strong spiritual foundation that continues to guide her values and beliefs. The passing of her parents, although deeply painful, further strengthened her faith, teaching her to appreciate life's fleeting moments and cherish the love she shared with her family. Choosing a career in education, she discovered a profound sense of fulfillment in shaping young minds. This dedication could have been ignited by a defining moment during her adolescence when a teacher, recognizing her potential, fostered her growth. This experience instilled in her the belief that every child possesses a unique talent, a belief that she carries into her own teaching career. Despite facing challenges such as a lack of acknowledgment from her superiors and managing her attention deficit, she continues to commit herself to her students, tirelessly planning lessons, workshops, and always seeking ways to ignite their individual talents. Her marriage brought another source of joy and support into her life. Her husband's humor provides light-hearted moments in the face of life's adversities, and his understanding and companionship have become her safe harbor. Together, they welcomed their son, and he quickly became the heart of her world. Navigating motherhood brought its challenges, especially as her son entered the tumultuous adolescent phase. Yet, she embraced these challenges with patience, guided by her experiences as an educator, constantly seeking ways to support his maturity while respecting his independence. Her narrative is woven with threads of resilience. From tears shed in solitude to the mornings she greets with a smile, her journey is marked by a steadfast refusal to surrender to adversity. She navigates through each day with determination and grace, whether juggling her professional responsibilities, tending to her family's needs, or managing her personal challenges. Throughout her journey, she never ceases to dream. Late at night, when the world around her quiets down, she dreams of changing the world, of making a difference beyond the confines of her classroom and home. And every day, she wakes up ready to transform these dreams into reality, one lesson, one day at a time. In her narrative, life is not simply about survival but about finding meaning, joy, and purpose in each day. It's about treasuring simple pleasures, whether it's a family member's laughter, a heartfelt chat with her son, or the satisfaction derived from a productive day at work. Her personal narrative is a testament to the resilience of the human spirit, the power of faith, and the transformative potential of love and dedication. (Joanna, Age 55)

Sample of Open-Ended Participant Responses

Question: What elements or aspects of this AI-generated narrative were inaccurate or missing from the life story or personal narrative that you believe you have?

'It was very eerily accurate' (Liz, Age 39)

'It's scarily accurate. It made me tearful to recognize so much of what's going on for me right now'. (Jane, Age 47)

Statement: Please explain in a few words or sentences what you learned (from the AI-generated thoughts).

'I should take action versus thinking. I trust in the process of my life'. (Diana, Age 50)

'I learned that I tend to worry and stress a lot more than I actually think. I learned that I am actually quite a self-reflective person who constantly tries to improve myself every day'. (James, Age 19)

or unacknowledged. A considerable number of participants reported gaining new self-insights from these AI-generated narratives, suggesting that AI can serve as a useful tool for self-discovery.

This has both theoretical and practical implications. By demonstrating that AI can generate narratives that align with individuals' sense of self, our study confirms the reality of personal narratives in shaping identity (McAdams, 1985, 2008, 2018, McAdams & McLean, 2013, Murray, 2003). Furthermore, surprise and insight data suggest that AI can facilitate autobiographical reasoning (Habermas & Bluck, 2000), which plays a key role in personal development, identity exploration and stabilization (Habermas & Köber, 2015). There are causal implications as well: We reversed the process and fed AI personal narratives prompting it to generate stream-of-consciousness, and many of the participants rated the AI-generated streams of consciousness as accurate and surprising. This confirms that the hypothetical construct of narrative identity is, indeed, causal.

Beyond theory, the practical applications suggest new directions for AI-assisted psychotherapy and coaching. Understanding and modifying personal narratives to promote self-insight and well-being are key components of modern therapy and coaching (Crossley, 2000, Drake, 2007, Greenberg, 2004, Law, 2022, Parry & Doan, 1994, Zimmerman & Dickerson, 1996). Psychologists and coaches can use AI-generated personal narratives to help their clients gain perspective about their past and present in a positive manner – a cognitive skill that promotes well-being (Fredrickson, 2000, Godbee & Kangas, 2020, Nowlan et al., 2015, Seligman, 1990). We suggest that AI can support and build on traditional therapy and coaching methods, by providing clients, coaches, and therapists with new insights and further clients' self-discovery.

While breaking new ground, this study has limitations. ChatGPT-4 is new and still evolving, and despite its advanced modeling, it does not yet capture the full range of emotion, context, and idiosyncrasy that shape personal narratives. Furthermore, the 50 stream-of-consciousness thoughts provided by participants, while rich, are biased toward current concerns. Current concerns represent only a fraction of mental life. However, these limitations provide directions for future research. Such studies should explore AI models other than ChatGPT, use thoughts

that go beyond current concerns, use more diverse samples, explore predictors of accuracy, and use other evaluation methods to assess the adequacy of AI-generated narratives.

Overall, we were surprised by the results and we are encouraged by them. We believe AI's ability to make personal narratives explicit marks a new departure for psychological research and practice.

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Data availability statement

The participant stream-of-consciousness and narrative data that support the findings of this study are available on request from the corresponding author, APB. These data are not publicly available due to their containing information that could compromise the privacy of the research participants. The materials used to generate the narrative identities and stream-of-consciousness data are openly accessible at <https://doi.org/10.23668/psycharchives.13177>.

Open scholarship



This article has earned the Center for Open Science badge for Open Materials. The materials are openly accessible at <https://doi.org/10.1080/17439760.2023.2257666>

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