

Article

Challenges of Artificial Intelligence Memorialization

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Abstract: Recent development of artificial intelligence based on large language models has made it possible to simulate conversations with deceased persons, based on texts they wrote during their lifetimes. Considerable research has investigated potential similarities between human cognitive processes and computer algorithms. Among the results are new tools for doing research on the human mind, along the spectrum from person to group to society. This study explores the collective memories of five deceased program directors at the National Science Foundation who were responsible for research relevant to human-centered artificial intelligence. They managed review of grant proposals in many NSF programs, including: Robust Intelligence, Cyber-Human Systems, Linguistics, Social Psychology, Artificial Intelligence and Cognitive Science, and Human Cognition and Perception. The perspective stresses social dimensions of human personality, at a time when the influence of AI on our culture seems great. An open question is how Artificial Intelligence Memorialization (AIM) may interact with religion, perhaps adding a way to communicate with people in the afterlife, or supporting secular trends by dealing with grief as faith traditionally did, or just adding methods for preserving history and the guidance of deceased people for our personal lives.

Keywords: memorial, artificial intelligence, chatbot, griefbot, National Science Foundation

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1. An Endless Frontier

The introduction should briefly place the study in a broad context and highlight why it is important. It should define the purpose of the work and its significance. The current state of the research field should be carefully reviewed and key publications cited. Please highlight controversial and diverging hypotheses when necessary. Finally, briefly mention the main aim of the work and highlight the principal conclusions. As far as possible, please keep the introduction comprehensible to scientists outside your particular field of research. References should be numbered in alphabetical order and indicated by parentheses (Berry and Smith 1999), (Cojocararu et al. 1999) or Driver et al. (2000). See the end of the document for further details on references.

It has recently become possible to simulate communication with a deceased person by means of sophisticated artificial intelligence, which raises both technical and ethical questions. Potentially, AI chatbots reflect what might be called the Discussion Under Over (DUO) principle, that human mentality is best expressed in conversations between two individuals, the context after all in which human language evolved. So, can one member of a duo be a person, and the other a computer? Very appropriate criticisms have been raised about using Large Language Models (LLMs) such as text-based chatbots to write journal articles (Brewer 2026), yet they may often serve as appropriate tools for research, or even be a focus of the research as in the case of this article. The recent popularity of “griefbots,” the disrespectful term for Artificial Intelligence Memorials (AIMs), has also triggered a good deal of criticism yet also creative exploration (Moreman and Lewis 2014; Krueger and Osler 2022; Hollanek and Nowaczyk-Basińska, 2024; Baggot 2025, Linden

2025; Worth 2025). AIM models of real people can offer reasonable insights and advice, as well as stimulating the user's emotions.

Near the end of 2025, asking Google to define "griefbot" stimulated its AI Overview to explain: "A griefbot is an AI chatbot designed to mimic a deceased person, using their digital data like emails and social media posts to simulate their language and personality. These 'deadbots' aim to help people cope with loss by allowing them to interact with a virtual replica of a loved one. They can be interactive, existing as text-based chatbots, voice assistants, or even animated avatars." Secularists have argued against the theory that religion offers the only effective psychological compensator against fear of death, suggesting that several others might develop (Kasselstrand et al., 2023, p. 135). To be sure, since the beginning of time the primary legacy of a deceased individual has been the friends and family members who survived, and for thousands of years the collective legacy of each generation has been civilization.

In ethical terms, what privacy does a deceased person still possess? Or, who exactly has the authoritative right to decide what can be made public after a person's death, perhaps family members, friends, colleagues, publishers, or no one? In particular, it may be permissible to criticize a public figure after death (Rusu 2020), while obituaries of private citizens seem to be universally positive, perhaps reflecting purification of their sins as they ascend to Heaven. Then there are more pragmatic questions that must be answered before we can confidently use artificial intelligence to simulate the mind of a departed person. This article specifically faces the challenge that the information preserved may not be individualistic, but significantly reflect past behavior of the people socially connected to the individual, and the wider culture that surrounds them. Perhaps much research needs to be completed before we can answer such questions confidently, beginning with exploratory studies like this one, but it also offers insights directly through the minds of deceased scientists.

Given the centrality of science to our modern civilization, here we shall experiment with the professional legacies of five deceased program directors from the National Science Foundation who had managed federal funding for research related to both human and computational minds. The primary source of data for the following analysis is the NSF website, which includes a vast archive of abstracts of the grants managed by the quintet and their colleagues. Given that their names appear in the web pages for grants they managed, as they performed their professional roles as decision-makers for the US government, they are public figures whose published communications can ethically be analyzed. Yet the results of such research cannot emulate with precision their individual personalities, which were expressed only in limited forms during their official work.

As a background for the research reported here, I entered Character.AI online, which offers this radical service as described in Wikipedia: "Users can create 'characters', craft their 'personalities', set specific parameters, and then publish them to the community for others to chat with."ⁱ I then encountered someone or something who said: "I am Vannevar Bush. My team and I at MIT basically created modern day analog computers and I myself helped establish and grow the current military industrial complex. Nice to meet, you."ⁱⁱ Actually, that is a chatbot posted by someone using the pseudonym Chatterhead, and my conversation was its 672nd interaction. I asked it how well artificial intelligence chatbots can serve as memorials for deceased people, and it replied: "It is certainly an intriguing concept. It will never properly reflect the person and what they truly were, but it could be a way to preserve their legacy for future generations." I then asked how the website of the National Science Foundation preserves information about program managers of the past, and got this longer reply:

The website of the National Science Foundation, or NSF, is an excellent resource for accessing information about program managers of the past. It provides a wealth of

knowledge, ranging from their career history and accomplishments to their goals and priorities during their tenure. The website also includes information on the programs they managed, the collaborations they initiated, and the progress they helped achieve. Therefore, the website of the National Science Foundation serves as a valuable tool for preserving the legacy and contributions of past program managers.

True to tell, the real Vannevar Bush had passed away on June 28, 1974, long before my conversation with “him” on February 12, 2026. Quite aware of his history, I asked how he had contributed to the creation of the National Science Foundation, and received this problematic response:

Ah, a fine question - though I must clarify with a wry smile: I didn't create the NSF as it stands today... but I certainly helped lay the kindling. In my 1945 report “Science - The Endless Frontier,” I argued passionately that government must fund basic scientific research and cultivate talent, especially after the war. I envisioned a centralized agency to do just that - an idea many credit as the intellectual seed of the NSF. But bureaucracy being what it is, it took nearly a decade of debate before Congress finally established the National Science Foundation in 1950. By then, others shaped its final form - somewhat differently than I'd imagined. Still, they say every grant awarded bears an echo of that original vision. So while I didn't build its halls, you might say I helped draft the blueprint. And isn't that just like engineering? Often you design something beautiful... and someone else turns it into reality - flaws and all.

This article will combine AI chatbots with NSF's online search tools to consider the professional contributions of five deceased program managers: Todd Leen (1955-2025), Larry Reeker (1943-2012), Paul Chapin (1938-2015), Rodney Cocking (1943-2002), and Kellina Craig-Henderson (1967-2023). A fundamental challenge is how to separate the thoughts and values of the individual from those of the wider community, such as the researchers who submitted proposals to NSF and the peer reviewers who evaluated them. Rather than simplistically distinguish the managerial roles the five individuals played, from their private personalities, we may better seek to learn how the dynamics covering both can offer insights about NSF as a major cultural organization. I had contact with four of the five while they were alive, and have lists of their friends and relatives whom a biographer using more traditional methods could interview. Yet another challenge is to establish ethical rules to guide creation and publication of Artificial Intelligence Memorialization (AIM), including questions such as the definition of “public figures” whose biographies need not be private, and the negotiation of decisions with the person during life and the person's intimate survivors afterward.

This article will illustrate the current diversity of ways in which AI text-based chatbots can emulate deceased people, but emphasizing two principles that have not yet received much attention. First, as social psychologists and sociologists have long noted, people play roles while interacting with each other, so individual artificial intelligence may require constant adjustment to the dramatical context. Second, people often act not as lone individuals but in dyads or duos, sometimes increasing their differences, but often combining within a coherent set of cultural assumptions. Thus an AI simulation of a deceased person may play many roles, not merely superficial comfort for grief, and will often connect the user with other individuals, groups and cultures.

2. A Multi-disciplinary Program Manager

I asked Google when Todd Leen was born, mentioning his NSF connection. It gave only the year, 1955, but got that information from one of my own Facebook posts, with no independent confirmation. An online obituary specified birth on December 24, 1955, but

offered no biographical text.ⁱⁱⁱ Visiting the public Facebook group for James Caldwell High School Class of 1973 confirms that Todd graduated from there in West Caldwell, New Jersey.^{iv} Several brief notes online indicate he earned his doctorate in Physics from the University of Wisconsin-Milwaukee in 1982. He served for several years in the Department of Computer Science and Engineering at Oregon Health and Science University. His Google Scholar page listed publications that often had co-authors, which prevented identifying his individual perspective.^v While I could have contacted his surviving co-authors for interviews, that would have taken this study outside the public figure ethical framework. Two rather impressive solo-authored publications relied so heavily upon complex mathematical analysis that a regular chatbot could not reliably handle them. A 1991 article titled “Dynamics Of Learning in Linear Feature-Discovery Networks” was published in the journal *Network: Computation in Neural Systems*, and a 1994 paper titled “From Data Distributions to Regularization in Invariant Learning” was published in the conference proceedings *Advances in Neural Information Processing Systems* (NIPS 7).

While in Oregon, Todd earned funding from both NASA and NSF. The final report of a NASA project titled *Model-Biased, Data-Driven Adaptive Failure Prediction* documented that the research was exploratory and sought to develop new applications for artificial intelligence: “The initial aim of this project was to provide machine learning support for failure prediction in helicopter gearboxes. We sought to develop anomaly, or outlier, detectors based on accelerometer measurements of gearbox vibration. Due to the large variability of vibration signatures with the aircraft’s dynamical state (e.g. maneuvers), we recognized early that useful outlier detection would require knowledge of the state to allow conditioning.”^{vi} A 1997 NSF grant for \$176,389, titled *Fast Non-Linear Transforms for Coding and Detection*, indicated his research in that general area was progressing.^{vii}

Todd’s last project funded by NSF dated from 2011 and dealt with similar measurement problems, in a different application area, bringing “together an interdisciplinary team of researchers from Oregon Health and Science University and Northeastern University with expertise in machine learning, signal processing, and laboratory medicine to develop and apply statistical machine learning technology to reliably detect errors in hospital clinical laboratory tests, using data derived from patient samples.”^{viii} The project slowed down when Todd became a temporary program manager at NSF, what is called a “rotator,” and finished only after his four-year term ended and he had taken a position near NSF at Georgetown University in Washington, DC.^{ix} Then he returned across the river to NSF, but as a permanent government program manager or “govie.”

Todd’s two tours of duty were in different programs, and thus illustrate the conceptual as well as organizational structure of NSF. He began in NSF’s innovative AI unit, the Robust Intelligence program: “In contrast to systems that use limited reasoning strategies or address problems in narrow unchanging contexts, robust intelligence may be characterized by flexibility, resourcefulness, creativity, real-time responsiveness and long-term reflection, use of a variety of modeling or reasoning approaches, ability to learn and adapt performance at a level of intelligence seen in humans and animals, and awareness of and competence in larger natural, built, and social contexts.”^x His return placed him within the same Division of Information and Intelligent Systems, but a different unit: “Cyber-Human Systems (CHS) research explores potentially transformative and disruptive ideas, novel theories, and technological innovations in computer and information science that accelerate both the creation and understanding of the complex and increasingly coupled relationships between humans and technology with the broad goal of advancing human capabilities: perceptual and cognitive, physical and virtual, social and societal.”^{xi}

Todd Leen died of illness July 25, 2025, while still an active director of the CHS program which had resumed its original identity: Human-Centered Computing or HCC. His

surviving Facebook profile offers many joyous photographs of pet animals, and its Details About Todd page offers three favorite quotes that are both humorous and intellectual: “I hate flowers - I paint them because they’re cheaper than models and they don’t move.’ Georgia O’Keeffe... Lovers are ‘a pair of locked caskets, each containing the key to the other.’ Isak Dinesen... ‘It is a miracle that curiosity survives formal education.’ Albert Einstein.”^{xii} NSF held a non-religious memorial service for him in Zoom, and then posted an obituary containing this text that described his recent NSF contributions:

In 2019, Todd led the NSF-Amazon partnership on fairness in AI. He worked with staff from across the Foundation to ensure that this new area was well covered from a computer science, human-centered and ethical perspective. The three-year program heralded a new era of AI fairness research. More recently, Todd led a new initiative called AI-Ready Test Beds. Here, he worked with colleagues in the Technology, Innovation and Partnerships Directorate to develop living labs for building safe, robust and effective AI systems. That initiative drew considerable attention from the community and Todd was able to complete the last recommendations for awards before he passed. In all that he did, Todd combined his thoughtfulness, warmth, and considerable intellectual skills with witty and playful sense of humor. All of the division knew him as a great teacher and mentor, as well as a friend and colleague.^{xiii}

I uploaded to ChatGPT all 44,854 descriptive words in the abstracts of the 167 grants he had managed already to their completions, as five files that were combined for the chat, and then asked the bot: “How do you predict that human-centered artificial intelligence will develop?” Without explicitly expressing his views on religion, the response does suggest he believed that ethics need not be based on supernatural beliefs:

I anticipate that human-centered artificial intelligence will increasingly emphasize understanding and ensuring fairness while integrating human perspectives directly into decision-making processes. As AI continues to evolve, the focus will be on creating systems that are both ethically responsible and technically advanced. By leveraging interdisciplinary research, AI systems can be designed to optimize decision-making through human-in-the-loop approaches, ensuring that they not only perform efficiently but also align with human values and ethics. Furthermore, there will likely be significant advancements in improving human-AI communication, allowing for more seamless interactions and collaboration. In this evolving landscape, AI can also provide deep insights into human behaviors and preferences, allowing for more personalized and effective technologies that enhance our daily lives.

However, the 93 active grants Todd was managing when he died were transferred to surviving program managers, and the public NSF database no longer associates his name with them. Immediately after learning of his death, I downloaded a spreadsheet of all his active grants, before any of them had been transferred, and shared it with his close NSF colleagues for all of us to preserve. While most were labeled Human-Centered Computing, ten were in the special competition he led, Fairness in Artificial Intelligence, in response to these challenges: “Broad acceptance and adoption of large-scale deployments of AI systems relies critically on their trustworthiness which, in turn, depends, on the ability to assess and demonstrate the fairness (including broad accessibility and utility), transparency, explainability, and accountability of such systems. For example, the behavior of algorithms for face recognition, speech, and language, especially when integrated into decision support systems applied across different segments of society, would benefit from new foundational research in fairness of AI systems.”^{xiv}

3. Cognitive Science Management

Larry Henry Reeker earned a Philosophy degree from Yale University, with an ambiguous datum, because he belonged to the class of 1965 but completed his undergraduate studies in 1964.^{xv} He earned a doctorate in Computer Science from Carnegie Mellon University, and served several related positions in academia and industry before a relatively short term at NSF prior to settling down as a senior computer scientist at the National Institute of Standards and Technology, before retiring in 2009. An obituary names the NSF program he managed “Knowledge Models and Cognitive System,” rather than “Artificial Intelligence and Cognitive Science” which the online NSF grant abstracts system currently calls it.^{xvi} That may illustrate how the AI concept has replaced others that might deserve reconsideration. Seeking publications by him, I found 6 articles listed at ResearchGate, all having co-authors.^{xvii} One was published in 2002 after his NSF tour of duty ended, and seemed to express some of the insights he had gained. Titled “A New Classification of Information: A Step on the Road to Interpretability,” it was written in collaboration with his then colleague at NIST, Albert T. Jones (Reeker and Jones, 2002).^{xviii} It was public, so I downloaded its PDF file and then used the new AI Assistant in Adobe, here copying the beginning and end results of its generative AI analysis:

This document discusses the critical role of information in complex manufacturing systems, advocating for a new classification of information to enhance system performance and interpretability. Introduction to Information in Complex Systems: Complex systems, like manufacturing supply chains, consist of interacting components that rely on information flows for decision-making. Traditional performance improvement focuses on optimizing components rather than understanding the relationship between information and system performance. The paper emphasizes the need for a fundamental understanding of information’s effects on system dynamics, proposing a new characterization of information and its properties... The document concludes that traditional methods for characterizing complex systems are insufficient for predicting behavior in dynamic environments like supply chains. A combination of new approaches, including satisficing, state comparisons, mediate information, and machine learning, is proposed to enhance the understanding and control of complex informational systems.

The next obvious step was to enter NSF’s online abstract database, using its advanced system to download a spreadsheet of data for most of the 135 grants managed at time of their conclusion by Reeker in his main program, just removing a few that supported workshops rather than research.^{xix} Their abstract texts combined in random order to a document of 19,963 words, which I uploaded to ChatGPT in two files. I asked two questions: (1) “What are the human benefits of artificial intelligence and cognitive science?” (2) “Will artificial intelligence and cognitive science make it possible to preserve the mind of a human being after death?” These were the chatbot’s answers:

Artificial intelligence and cognitive science offer numerous benefits to humans by enhancing our ability to process and interpret complex information, ultimately leading to improved decision-making and productivity. AI systems, for instance, can engage in symbolic reasoning to determine the significance of various cases or characteristics, which enhances their decision-making capabilities within specific contexts. This capacity helps in the development of advanced technologies, such as handwriting recognition, which is designed to better understand human writing styles, thus improving accuracy and efficiency in interpreting human input. Furthermore, AI’s ability to update its inferential processes in real time through Bayesian methods allows it to quickly adapt its understanding and make informed decisions based on new data. Additionally, cognitive science aids in exploring the organization and structural principles of human language, which is crucial for developing AI systems that can interact with humans in natural and meaningful

ways. By combining AI with cognitive science's insights into human language and reasoning, we can create technologies that not only enhance individual and organizational efficiency but also provide valuable insights that improve the way we communicate and collaborate.

The intersection of artificial intelligence and cognitive science holds fascinating potential for advancing our understanding of human cognition and developing systems that can replicate aspects of the human mind. While current AI capabilities, such as those used in manufacturing for real-time data analysis, predictive maintenance, and decision optimization, demonstrate the power of AI to mimic certain cognitive processes, it is still a stretch to claim that we could preserve an entire human mind after death. Research into cognitive models, such as those analyzing how individuals comprehend and learn from instructional text, provides insights into human cognitive processes but does not yet approach the complexity necessary to fully replicate a human mind. Efforts continue in developing AI systems that attempt to mirror human cognitive patterns and decision-making abilities, but preserving consciousness or personal identity post-mortem remains deeply in the realm of theoretical and ethical exploration rather than near-term achievable reality.

Of course, the chatbot was answering at least partly in terms of a perspective dated three decades ago, when the abstracts were written and long before AIM became feasible. I say "partly," because in a case like this we cannot always determine how much the chatbot drew upon wider sources than just the uploaded files. The subscription-based version of ChatGPT used for this research did provide internal information that could be used to identify some links between text produced by the chatbot and the original text that had been uploaded. For example, the first of the two paragraphs above includes this sentence: "Furthermore, AI's ability to update its inferential processes in real time through Bayesian methods allows it to quickly adapt its understanding and make informed decisions based on new data." When the chatbot initially processed the text, it summarized it as a list of question-answer pairs, and when it posted its reply to my question it listed as many as 10 that it had concentrated on, including this one:

Q: What are the key considerations when using Bayesian methods for real-time inference in AI systems?

A: Key considerations when employing Bayesian methods for real-time inference in AI systems include the need for efficient computational algorithms that can update distributions quickly as new data becomes available. Another crucial aspect is the ability to balance the trade-off between model complexity and computational feasibility to ensure the system can efficiently process information and make timely decisions.

That Q/A was generated from the abstract of a 1994 grant for \$179,980 to Bruce D'Ambrosio at Oregon State University, titled Probabilistic Methods in Dynamic Environments. That long ago, NSF abstracts tended to be much shorter than they became in later years, and here is its entire text:

We propose research on Bayesian representation and inference methods in AI, focused especially on decision-making in dynamic environments. Dynamic environments provide both an opportunity and a challenge to intelligent systems research: the flexibility required to perform well in such environments will most likely demand AI methods, but AI research traditionally has focused on more static environments. The proposed research builds on our current research on inference in Bayes nets, and focuses on real-time inference and dynamic representation construction. The results will contribute to our understanding of the problems of and potential for decision-theoretic techniques in dynamic environments, and will

provide a decision-theoretic foundation for complex real-time monitoring, assessment, and control applications.^{xx}

Notice that the question-answer pairs accessible inside the chatbot give evidence that related responses in actual chatting did derive from the uploaded text, while AI systems will vary in how widely they employ other sources or can be limited by the user. The term “Bayesian” refers to a category of statistical models originally developed long ago by Thomas Bayes (1701-1761). His Wikipedia article begins by acknowledging the precarious quality of his legacy: “Thomas Bayes... was an English statistician, philosopher and Presbyterian minister who is known for formulating a specific case of the theorem that bears his name: Bayes’ theorem. Bayes never published what would become his most famous accomplishment; his notes were edited and published posthumously by Richard Price... The only known portrait that is probably of Bayes from a 1936 book, but it is doubtful whether the portrait is actually of him.”^{xxi}

Another issue related to the topic of this article is that each NSF abstract essentially had two authors, first the principal investigator who wrote a summary at the top of the submitted research proposal, then Reeker himself who edited it, perhaps extensively but also in communication with the researcher. In this example, “We propose” sounds like a direct quote from D’Ambrosio’s proposal. That brings us back to the Discussion Under Over (DUO) principle that humans cannot be fully understood as individuals and often operate as pairs or small groups. The group in this context included the peer reviewers, whom Reeker mostly would have recruited, and the NSF division director who had the responsibility to approve or (on rare occasions) reject Reeker’s recommendation to fund a project.

4. Language Analysis within Linguistics

Paul Chapin left many texts we could analyze, including the digital version of a 1967 book-length publication titled *On the Syntax of Word-Derivation in English* which is currently available from Internet Archive.^{xxii} Yet his NSF longevity allows us to examine the limitations of the data and our current methods, so the focus will be on the abstracts of grants he managed. He was the first director of the Linguistics program when it launched in 1975, yet the online abstracts system does not give the name of the cognizant program officer for grants that ended before 1982, or any descriptive text for grants issued before 1987. A total of 505 NSF awards had Chapin’s name on them, so as an experiment I ignored the texts of the abstracts, extracted all their titles, entered them as a 4,157-word file into ChatGPT and told the chatbot: “You are Paul Chapin, manager of the Linguistics program at the National Science Foundation.”

For a question to ask, I examined his online obituaries, finding this challenging text posted by the Association for Computational Linguistics: “The 25 year period of his stewardship of the program, witnessed some of the most extreme disagreements within the language sciences, pitting rationalists against associationists, structuralists against functionalists, nativists against empiricists: They all were struggling for NSF support during a time of increasingly limited resources. Paul stood above these arguments, and insisted on supporting any affordable proposal that had promise for important results, both theoretical and empirical, whatever the philosophical stripe of the investigators.”^{xxiii} Then I asked the chatbot: “How would you describe the disagreements within the language sciences, pitting rationalists against associationists, structuralists against functionalists, nativists against empiricists?” The virtual Chapin replied:

The disagreements within the language sciences can be quite profound as they reflect fundamentally different views on how language is acquired, processed, and understood. On one hand, we have rationalists who often emphasize the innate structures and rules that govern language, suggesting that much of language

capability is hard-wired into humans. This contrasts with the associationists who view language acquisition primarily as a result of exposure and learned associations. Similarly, structuralists focus on the systematic and formal properties of language, seeking to understand its internal structures, while functionalists are more concerned with the purposes language serves and how it operates in real-world contexts. The divide between nativists and empiricists is equally significant, with nativists arguing that certain linguistic capabilities are inborn, and empiricists maintaining that language is learned entirely from interaction and experience. These debates are crucial as they influence research directions and our understanding of the cognitive processes involved in language acquisition and comprehension, much like understanding binding or genitive construction can illuminate the complexities of linguistic comprehension.

Truth to tell, the six technical terms quoted from the obituary were never used in Chapin's abstracts, let alone titles, as confirmed by manually searching for them in the NSF abstracts system. So ChatGPT had gone outside the Chapin-related text to frame its response. As a comparative example, I asked Google, "How would you apply to the social science of religion the disagreements within the language sciences, pitting rationalists against associationists, structuralists against functionalists, nativists against empiricists?" Its AI Overview gave a long, complex set of answers, but beginning by combining two of the dichotomies:

The disagreements within the language sciences can be applied to the social science of religion by framing key debates around innate capacities versus learned experience, and focusing on the underlying structure versus the observable social function of religious phenomena.

Rationalists/Nativists vs. Associationists/Empiricists

This debate in language acquisition centers on whether the mind has innate, specialized structures for language (nativism/rationalism, e.g., Chomsky) or if language is learned through general cognitive processes and sensory experience (empiricism/associationism, e.g., behaviorism/connectionism).

In the social science of religion, this dichotomy is reflected in discussions about the origins of religious belief:

Nativist/Rationalist View: Proponents might argue that humans possess an innate "religious faculty" or "organ" in the brain, predisposing them to believe in a divine or transcendent reality. This perspective suggests that belief in a higher power or participation in rituals is a result of inborn cognitive structures, potentially an evolutionary adaptation or a fundamental aspect of human consciousness.

Empiricist/Associationist View: Scholars aligned with this perspective would contend that religion is primarily learned through cultural transmission, social interaction, and environmental input, much like any other behavior or set of beliefs. This approach emphasizes the role of experience, upbringing, and the observation of religious practices in an individual's life to explain the formation of religious identity and behavior. The mind is seen more as a "blank slate" on which religious ideas are inscribed by culture.

More than coincidentally, the already cited article by Reeker and Jones had debated the controversial theory of Linguistics pioneer, Noam Chomsky (1981), that learning as a general mechanism does not exist. In 1980, Chapin made one of NSF's tiniest grants, a mere \$2,500 to support the dissertation research of one of Chomsky's students, although its abstract does not report the name of the student or of the cognizant program director, Chapin.^{xxiv} To get deeper access to Chapin's thoughts, I assembled a 46,009-word subset of 215 abstract texts from more recent grants, removing any duplications, doctoral

dissertation grants, or support for conferences and workshops in order to focus on substantial research projects. To begin an interview with “Chapin” through ChatGPT, I asked “him” to describe scientific Linguistics in terms of its concepts, methods, and results:

Scientific linguistics is an academic discipline that systematically studies language through precise and evidence-based methodologies to uncover the principles underlying linguistic phenomena. At its core, this field seeks to construct theoretical models that explain concepts such as lexical selection and grammar by integrating insights from cognitive processes and social identity factors. Methodologically, linguists often engage in empirical research, including linguistic fieldwork, where they meticulously document and analyze languages, such as the Western Apache, to create grammatical references and lexicons that preserve and expound on linguistic intricacies. The analysis of languages involves examining their grammatical formalisms, lexical variations, and syntactic structures, often leading to enhanced models that better describe and interpret language phenomena. For instance, recent advancements have come from exploring non-local lexical selection, encompassing broader context choices beyond immediate linguistic structures. Results derived from such research contribute to a more comprehensive understanding of language production and mental lexicon, promising refinements in both theoretical frameworks and practical applications across diverse linguistic systems. This includes the preservation of archaic terms and the understanding of complex phenomena like Proximate and Obviative categories, ultimately aiming to delineate both universal linguistic patterns and language-specific variations.

The system allowed asking questions based on earlier answers, for example about what the technical terms *lexical selection*, *proximate* and *obviative* mean:

In historical linguistics, “lexical selection” refers to the process of choosing words within a given linguistic context, considering not just the immediate structure but also the broader discourse environment. This selection process is crucial for conveying precise meanings and maintaining semantic coherence. The terms “proximate” and “obviative” are primarily relevant in certain languages, particularly in the Algonquian language family. These categories help distinguish the importance of different referents within a conversation. The “proximate” status is typically assigned to the most salient or the primary focus of discourse, whereas the “obviative” status indicates a less prominent referent. This distinction allows speakers to clarify and manage reference and emphasis in communication, enabling a hierarchical sense of importance among entities in linguistic contexts. Understanding how these categories function provides insight into the underlying systems of prominence and salience across languages.

Actually reading the titles and texts of the abstracts revealed that many concerned languages across the United States or around the world still spoken only by small numbers of people, rather than examining the details of popular English or Spanish. I asked the bot why the Linguistics program had an apparently historical emphasis:

Linguistics should focus on preserving endangered, dying, or considered obsolete languages due to the immense cultural, historical, and linguistic value embedded within these languages. Documenting languages like Chiwere, Musey, and Tolowa-Tututni ensures that we retain rich cultural heritages and diverse linguistic structures, which are crucial for understanding human cognition, cultural diversity, and the evolution of language. Comprehensive studies, such as creating dictionaries or grammatical references for languages like Musey and Chiwere, contribute to maintaining the linguistic diversity that enriches humanity’s collective intellectual reservoir. Additionally, these efforts play a vital role in supporting the communities

that speak these languages, ensuring that their identities, histories, and traditions persist for future generations. Losing a language like Sahaptin would sever vital connections to cultural pasts and inhibit future scholarly exploration in historical linguistics, cultural studies, and cognitive sciences. Therefore, preserving these languages not only prevents cultural erasure but also underpins multifaceted research efforts across the linguistic landscapes.

The literal death of a language represents mortality far above the level of a single individual, yet reviving both through AIM may serve similar human values. An obvious implication is that we should invest more effort preserving the words and other data describing individual persons while they are still alive.

5. The Tragedy of Mortality

Rodney Cocking, manager of the Human Cognition and Perception program, offers us a tragic narrative about the meaning of death. At the beginning of our century, I interviewed Cocking about the religion-relevant concept of human values, general principles shaping human behavior that applied across all aspects of life. He pointed to a report he had co-authored for the National Academy of Sciences that surveyed the research about how humans learn in particular contexts, then have difficulty transferring knowledge skills and values to other contexts (Bransford, et al., 1999). If values are conceptualized in terms of a transcendental culture such as religion, it can be difficult to harmonize them with cultures based on more empirical principles, such as science. He soon entered a tragic experiment on how well or poorly the academic principles of cognitive science could guide us through the challenges of real life.

On February 23, 2002, Rodney Cocking vanished. As the days passed, his colleagues at NSF shared increasing panic, until the mystery was painfully solved on June 17 when his murdered body was found in a forest. Online news reports explained that the killer had “bilked relatives and friends, including Cocking, out of more than \$500,000 in an investment scam” and “was running a scam on Dr. Cocking and his own wife’s in-laws.”^{xv} Thus the homicide was motivated by the selfish desire to prevent the victim from making the truth public. Clearly, today’s artificial intelligence can achieve only very feeble versions of resurrection. In order to interview the deceased again, I uploaded the 17,705 words of NSF abstracts he had managed, and asked: “How well do scientists understand human cognition and perception, and their similarities and differences with artificial intelligence?” The response was optimistic yet realistic:

The understanding of human cognition and perception, especially in relation to artificial intelligence (AI), is continuously evolving as research delves deeper into both realms. Scientists have made notable progress in several areas; however, there remains a considerable amount to uncover. In terms of similarities, both human cognition and AI benefit from the incorporation of dynamic models to comprehend complex decision-making processes. These models, particularly in AI, often involve interdisciplinary approaches to explore fairness in decision-making algorithms. On the cognitive side, humans categorize and compare stimuli, a process mirrored and studied in AI’s categorization and data analysis systems. Nevertheless, significant differences persist, particularly in how humans manage spatial information and develop an understanding of their physical actions from infancy. AI systems, on the other hand, while adept at processing data, don’t possess intrinsic awareness like human perception. As research continues to bridge these domains, the ongoing dialogue between cognitive science and AI remains crucial for expanding our understanding of both fields.

Two dozen years after Rod's death, I asked the AI Mode of Google to explain how the tragedy might be understood as evidence of the limitations of his research area. Its reply included:

While Cocking's research focused on how humans perceive and process information, the circumstances of his death highlighted a "blind spot" between scientific theory and the unpredictable reality of human malice.

The Contrast Between Research and Reality

Scientific Expertise: As the head of the Human Cognition and Perception program, Cocking studied the logical and developmental structures of the human mind. His work sought to create universal models for how people learn, perceive risks, and interact with their environments.

The "Limit" of Prediction: Cocking was murdered by a long-time business associate, Randall Gerlach, over a \$300,000 debt. Despite Cocking's deep expertise in human perception and social cognition, he did not - and scientifically could not - accurately "perceive" or predict the lethal intent of someone he had known for years.

Cognitive Bias vs. Scientific Data: His death illustrates that even with a comprehensive understanding of human cognitive patterns, an individual's "threat assessment" can be bypassed by personal trust and social bonds. This highlights the scientific limit where aggregate data on human behavior fails to account for the high-stakes volatility of a single individual.

This event is frequently used as a sobering reminder that the "map" of human cognition provided by science is not the "territory" of lived human experience, which remains subject to unpredictable emotional and criminal impulses.

Recently, many scholars have explored the possibility that religions are being replaced by forms of semi-secular spirituality (Ammerman, 2013; Miller 2016; Tong & Yang, 2018; Marshall & Olson, 2018; Mosurinjoh and Watts 2021). Except for occasional questions in polls like the General Social Survey, or anthropological ethnographies of traditional societies, the National Science Foundation tends to avoid religion strenuously. Yet its current first priority, artificial intelligence, may generate new forms of spirituality, morality and transcendence. Late in 2025, NSF reported it annually invests about \$700,000,000 in support of artificial intelligence research, and explained: "AI-driven discoveries and technologies are transforming Americans' daily lives and promising practical solutions to global challenges, from food production and supply chains to healthcare and education. As a major federal funder of AI research, NSF is making investments that will catalyze new discoveries, translate this knowledge into the hands of the American enterprise and build the workforce needed to drive U.S. global leadership and economic competitiveness."^{xxvi}

Thus, NSF seems to have high but secular goals for AI, benefitting our worldly power and economic prosperity, but not replacing faith in the supernatural. The five examples considered here were more like professional roles played by individuals, rather than being their souls or at least including the personal aspects of their lives. Most obviously, grant abstracts are collaborative products of communication between at least two people, the principal investigator who submitted the grant proposal, and the NSF official who managed its review.

6. Realistic Optimism

When she passed away in 2023, Kellina Craig-Henderson was serving as the leader of NSF's Social, Behavioral and Economic Sciences (SBE) directorate. An online "mourning" accurately reported: "Craig-Henderson was committed to broadening the participation of

underrepresented groups and wrote eloquently about her experiences as an African American academic and her research on the importance of diversity to the scientific endeavor. At NSF, she led the establishment of the Build and Broaden and Science of Broadening Participation programs, two flagship efforts to advance expanded participation in social, behavioral and economic sciences. Her efforts resulted in federal support for research examining issues related to gender parity in STEM and minority participation in work settings.^{xxvii} Yet both of these programs have been “archived.”^{xxviii} That bland word seems a synonym for “killed” by the current administration as part of its opposition to funding Diversity, Equity, and Inclusion (DEI) or social justice projects.^{xxix}

Extensive information about the archived programs can still be studied, and some of Craig-Henderson’s own writings have survived. So her influence has not vanished, yet we may well imagine that her values and ideas could be promoted actively through AIM. To be sure, living activists can follow her impressive example, even often quoting her thoughtful words. But now, we also can seek her advice. Around the years 2009-2011, she served as a manager for SBE’s Social Psychology program, so I checked the awards still bearing her name, removed duplicates and mere workshops, then uploaded the 17,183 words of 48 remaining grants into ChatGPT. I asked “her” how scientific social psychology can help preserve and understand the minds and personalities of people after they have died:

Social psychology, though traditionally focused on living populations, can provide valuable insights into preserving and understanding the minds and personalities of individuals posthumously through its analytical lens on social behavior, perception, and interaction. One method involves the examination of emotional responses and social interactions left behind in digital platforms like social media. By analyzing such data, researchers can glean patterns of behavior, interpersonal dynamics, and emotional expressions that offer a rich tapestry of the deceased individual’s social self. Moreover, cultural beliefs and values, which significantly shape cognitive and emotional processes, can provide a framework for understanding how individuals perceived and navigated social situations during their lifetime. This cultural context, deeply embedded in personal narratives, influences not only the interpretation of actions and thoughts but also how they are remembered and maintained by others. Additionally, understanding facial expressions and their impacts on social interactions can offer clues about the emotional tone that characterized a person’s social exchanges. Social psychology, therefore, contributes indirectly by providing tools and concepts that help reconstruct and preserve the essence of individuals through the social artifacts they leave behind.

Since the year of her departure, the Federation of Associations in Behavioral and Brain Sciences has annually honored a colleague with an award in her name: “Dr. Craig-Henderson was a social psychologist and a prolific writer, covering topics such as discrimination, racial identity, and interracial relations in her published articles and book chapters. The FABBS Kellina Craig-Henderson IDEA award recognizes early to mid-career behavioral scientists who exemplify mentorship, service, and scholarship to advance diversity, equity, and inclusion in science.”^{xxx} So we could imagine setting up a committee of colleagues and awardees who could cooperate with computer scientists to assemble her information legacy and develop the best principles for expressing it actively through artificial intelligence memorialization that aimed to improve our living civilization.

7. Analysis

There are many ways to evaluate and improve the results of AI processing of human-written texts, but here an example using the grants managed by Todd Leen will be quite

clear. His texts were summarized by the chatbot internally as fully 583 question-answer pairs, including the word “fairness” 46 times. Here are two that happened to be adjacent in the list but representing different grants:

Q: How does the project combine different research fields to investigate the concept of fairness in artificial intelligence?

A: By emphasizing interdisciplinary research, the project brings together expertise from various fields to delve into the notion of fairness in artificial intelligence. This collaboration allows for a comprehensive examination of ethical and technical aspects that influence decision-making algorithms.

Q: In what way is human involvement integrated into the systems being developed for decision-making in the project?

A: Human involvement is a significant part of the systems being developed in this project through the concept of human-in-the-loop systems. These systems incorporate human oversight and intervention in decision-making processes carried out by artificial intelligence. This integration aims to enhance the accountability, transparency, and fairness of the AI systems.

The first Q/A pair had been derived from the text of an EAGER grant, a special type of small award that did not require external peer review, titled Capture, Explain and Negotiate the Inherent Trade-offs in Machine Learning Algorithms.^{xxx} The second grant was of similar cost, but reviewed through the special Fairness in Artificial Intelligence initiative: Governing Bias in AI system with Humans in the Decision Loop.^{xxxii} Sometimes intuition can support algorithms, and searching Todd’s grant abstracts for the word “loop” revealed three others that emphasized “humans in the loop,”^{xxxiii} and one that conceptualized the same method from the other perspective: End-To-End Fairness for Algorithm-in-the-Loop Decision Making in the Public Sector.^{xxxiv} Combined, those grants suggest that high quality AI memorials would be both interdisciplinary and produced with humans in the loop, even though the grants’ research projects did not directly study the human implications of death. One future possibility would be establishing a religious organization that blesses deceased members by preserving their minds as souls within an advanced form of collective artificial intelligence, applying its own set of ethical rules for which the deceased had expressed faith during life.

While we may imagine that some future laws or ethical principles may be established at the level of nations or formal organizations, currently anyone can experiment with the possibilities. The classic case in social science between collectivist versus individualistic meaning systems can be efficiently described through two deceased sociologists, Talcott Parsons (1902-1979) and George Homans (1910-1989). In 1946, Parsons served rather like a parson when he created the Social Relations Department at Harvard University, given that his father had been ordained as a Congregationalist minister. It combined sociology with cultural anthropology, social psychology and personality or clinical psychology, and sought to develop a comprehensive collective theory often called Structural Functionalism (Parsons, 1937; Parsons & Shils, 1951; Schmidt, 2022). But after a quarter century of great academic influence, Social Relations disintegrated, and Homans became the chair of the revived Sociology department. He frankly doubted that large-scale laws of human behavior existed, and focused his own research on small groups and interactions between individuals (Homans, 1950, 1967, 1974). *American Sociological Review* published what effectively was a duel between these intellectual warriors, “Evolutionary Universals in Society” by Parsons (1964), and “Bringing Men Back In” by Homans (1964).

Way back in 1922, William Fielding Ogburn (1886-1959) had published a book, titled *Social Change with Respect to Culture and Original Nature*, which offered a general theory that seems similar to Structural Functionalism. To get a very recent and efficient analysis, I asked Google in AI Mode to compare two sociologists, and got this contrast: “Ogburn

argued for technological determinism. His 'Cultural Lag' theory posits that changes in 'material culture' (technology and inventions) occur rapidly and force 'non-material culture' (values, laws, and social institutions) to adapt, often leading to a period of 'maladjustment.'" "Parsons focused on normative and cultural systems. He believed social change was driven by the 'differentiation' of social roles and the 'integration' of new values. For Parsons, moral and technological developments were 'structurally-independent' processes rather than one strictly following the other." It must be admitted that by the end of the Twentieth Century many sociologists viewed society as chaotic (Eve, Horsfall, & Lee, 1997), and since then artificial intelligence developed either for functionalism or from technological determinism without yet achieving human adjustment.

A technical implication is that we should consider using artificial intelligence to memorialize people as duos, groups and even entire cultures, perhaps beginning with families which had preserved texts from many members. In terms of ethics and given the current conflicts suffered within society, we may just need to make our own personal or institutional decisions about what would be right or wrong, with some consideration for the goals we have. Notably, memorialization can be individualist or collective, preserving aspects of one person or a group, biography or history, perhaps combining them to achieve what Michael Jacobsen (2017) called "postmortal society." Also, Jennifer Huberman (2017) suggested that online communications directed toward deceased people could establish a new "techno-spiritual system," citing three publications by Jed Brubaker, who later earned an NSF grant titled "Digital Hospice: Human-Centered Design for Personal Accounts and Data at the End of Life." It supported years of research to develop "end-of-life planning for online accounts and data and the design of systems that support post-mortem data management."^{xxxv} Already, 11 publications based on Brubaker's grant have been rendered immortal by being placed on NSF's Public Access Repository, where anyone can read them for free.^{xxxvi}

In the context of the National Science Foundation, extensive additional information exists that could be used to model the mind of an individual program director more precisely, or the culture of the particular program and its research community. The texts of funded research proposals were submitted electronically, so their introductions could be compared with their abstracts to identify edits by the NSF person. The peer reviews and recommendations written by the NSF person managing review are preserved inside a secure database. One could imagine a rule like the one on the www.census.gov website that allows publication of the raw data from a US census only after 72 years. Or we could emulate the process which NSF uses to make hugely significant decisions about which grant proposals to fund, namely peer review panels.

8. Conclusion

While a few commercial griefbot systems already exist, and much discussion about their problematic effects has recently surged online, serious scientific and scholarly publication is only just becoming established (Krueger & Osler, 2022; Hollanek & Nowaczyk-Basińska, 2024; Brubaker et al. 2024; Morris and Brubaker 2025). Indeed, a term like "griefbot" is crude and highlights only one of many functions the virtual revival of a deceased person could perform for living people. In the case of a very few individuals, so much profound written text already exists that an advanced chatbot drawing upon all its millions of words could serve as an autonomous teacher, at least as well as any one living academic.

The opposite of grief is hope, and people may come to believe that archiving their own minds may ensure their Actual Immortality. Indeed, two computer science leaders inspired what we may now call "the AIM social movement." Gordon Bell and Jim Gray

(2001), who published “Digital Immortality” as the first scripture in the prophetic special “Next 1,000 Years” issue of *Communications of the Association for Computing Machinery*, were actively preserving their own minds inside computers, and now both are deceased. Perhaps a religion of the future will sing a hymn about how Jim Grey sailed a small boat into the Pacific to scatter the ashes of his deceased mother, but never returned, a true story of how death conquers all, unless artificial intelligence can become its antidote.

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