

No. 20-5923

In The
Supreme Court of the United States

—◆—
CHARLES DON FLORES,

Petitioner,

v.

TEXAS,

Respondent.

—◆—
**On Petition For A Writ Of Certiorari
To The Texas Court Of Criminal Appeals**

—◆—
**BRIEF OF DR. STEVEN D. PENROD AND
27 ADDITIONAL COGNITIVE SCIENTISTS AS
AMICI CURIAE IN SUPPORT OF PETITIONER**

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INTEREST OF *AMICI CURIAE*¹

Amici are scientists whose research and scholarship demonstrate that hypnotically elicited recollections are too unreliable for forensic use.

Amicus Steven D. Penrod is Distinguished Professor at the John Jay College of Criminal Justice, City University of New York. His scholarship includes research methods in forensic psychology and decision-making in legal contexts. He is joined by the 27 additional *amici* scientists listed in the appendix.

Amici sign this brief in their individual capacities and not on behalf of their institutions.

**SUMMARY OF ARGUMENT**

At the time this Court decided *Rock v. Arkansas*, 483 U.S. 44 (1987), up through the years surrounding petitioner's 1999 trial, the scientific community was deeply divided over the recoverability of accurate memories through hypnosis and the effectiveness of safeguards to ensure the reliability of hypnotically elicited recollections. Today, by contrast, scientific research overwhelmingly establishes that hypnosis

¹ Pursuant to Supreme Court Rule 37.2(a), counsel for *amici* provided notice to all parties of *amici*'s intention to file this brief and did so at least ten days before its due date. All parties gave their consent. Pursuant to this Court's Rule 37.6, *amici* affirm that no counsel for a party authored this brief in whole or in part, and no person other than *amici* or their counsel made a monetary contribution to its preparation or submission.

poses dangers in the forensic context that are both severe and unpreventable.

The very process of memory retrieval creates opportunities for distortion and gap-filling, and law enforcement's use of hypnosis to fish for information about past events—eliciting details that may never have been observed, much less encoded in an eyewitness's brain as a “stored,” accurate memory—fails as a truth-seeking exercise. To the contrary, it invites inaccuracies, false memories, and the creation of “super” witnesses who are unnaturally confident, often impervious to cross-examination, and therefore disproportionately impactful when they testify. Consequently, hypnosis should not play a role in forensic analysis; at a minimum, prosecutors should be prohibited from using hypnotically elicited testimony to secure criminal convictions.

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ARGUMENT

I. AFTER YEARS OF CONFLICTING FINDINGS AND OPINIONS, SCIENTISTS HAVE NOW ESTABLISHED THAT HYPNOTICALLY REFRESHED MEMORIES ARE UNRELIABLE, EVEN IF SUPPOSED SAFEGUARDS ARE APPLIED.

Debate regarding the reliability of hypnotically enhanced memory and the effectiveness of safeguards began in the mid-twentieth century and continued into the early 2000s. While dangers associated with the use of hypnosis were recognized as early as this Court's

decision in *Rock*, 483 U.S. at 59-60, there was no clear consensus at that time on reliability and safeguards. In the years after petitioner's 1999 trial, scientific debate has given way to overwhelming agreement among experts that post-hypnosis memories are unreliable and that currently known safeguards cannot eradicate the risk of introducing misinformation into forensic contexts.

A. The Science Of Hypnosis Was Unsettled During The 1980s And 1990s, Although There Were Suggestions Of Problems.

When this Court addressed the issue of post-hypnotic testimony in *Rock*, there was no consensus "regarding the use of hypnosis as a means to refresh memory." Council on Scientific Affairs, *Scientific Status of Refreshing Recollection by the Use of Hypnosis*, 253 J. AM. MED. ASS'N 1918, 1918 (1985) [hereinafter *Scientific Status*]. While several fundamental problems with hypnosis had been identified, some experts and studies still suggested that it could be a useful tool. This debate would gradually be settled as more research was completed, but there would be disagreement through the 1980s and 1990s.

In the years preceding *Rock*, studies of the effects of hypnosis on memory cut in both directions. Some suggested that hypnosis could be a useful tool to improve memory recall without increasing false memories. See, e.g., Gerald R. Griffin, *Hypnosis:*

Towards a Logical Approach in Using Hypnosis in Law Enforcement Agencies, 8 J. POLICE SCI. & ADMIN. 385, 389 (1980). But other studies identified significant reliability defects in hypnotically “refreshed” memory. See *Scientific Status*, *supra*, at 1922; Michael R. Nash et al., *Accuracy of Recall by Hypnotically Age-Regressed Subjects*, 95 J. ABNORMAL PSYCH. 298, 300 (1986). And the unsettled nature of the science was reflected in the opinions of experts: A survey around the time of *Rock* reported that nearly half of expert psychologists would testify that hypnosis could assist memory retrieval. Saul M. Kassin et al., *The “General Acceptance” of Psychological Research on Eyewitness Testimony: A Survey of the Experts*, 44 AM. PSYCH. 1089, 1091 tbl.1, 1094 tbl.4 (1989).

Even as early as *Rock*, this Court recognized three dangers inherent in the use of hypnotically refreshed memories: suggestion,² confabulation,³ and memory hardening.⁴ But many scientists suggested that

² “Suggestion” occurs when hypnosis subjects affirm leading questions by the hypnotist. See *Rock*, 483 U.S. at 59-60; Bernard L. Diamond, *Inherent Problems in the Use of Pretrial Hypnosis on a Prospective Witness*, 68 CALIF. L. REV. 313, 333-37 (1980).

³ “Confabulation” occurs when hypnotized subjects “fill in details from the imagination in order to make an answer more coherent and complete.” *Rock*, 483 U.S. at 60. Confabulation also gives rise to pseudomemories lacking an actual basis in the subject’s past. See Diamond, *supra*, at 335.

⁴ “Memory hardening” is a sense of false confidence in hypnotically induced memories. See *Rock*, 483 U.S. at 60. Studies showed a strong “tendency of subjects who had undergone hypnotic induction procedures to be more confident of their answers to objective questions than those who had not, despite the fact that they were not more accurate.” Peter W. Sheehan &

procedural safeguards could mitigate these problems. See, e.g., Howard William Timm, *Suggested Guidelines for the Use of Forensic Hypnosis Techniques in Police Investigations*, 29 J. FORENSIC SCIS. 865, 871 (1984); *Scientific Status, supra*, at 1922. Dr. Martin Orne proposed one of the most influential sets of safeguards, cited not only in *Rock*, but also in state-court opinions prescribing admissibility procedures for post-hypnotic testimony. See Martin T. Orne, *The Use and Misuse of Hypnosis in Court*, 27 INT'L J. CLINICAL & EXPERIMENTAL HYPNOSIS 311, 335-36 (1979), cited in *Rock*, 483 U.S. at 60, *Zani v. State*, 758 S.W.2d 233, 243-44 (Tex. Crim. App. 1988), and *State v. Hurd*, 432 A.2d 86, 96-97 (N.J. 1981).⁵

The debate over hypnosis as a forensic tool continued throughout the 1990s. Some studies supported reliability concerns,⁶ while others suggested

Jan Tilden, *Effects of Suggestibility and Hypnosis on Accurate and Distorted Retrieval from Memory*, 9 J. EXPERIMENTAL PSYCH.: LEARNING, MEMORY, & COGNITION 283, 292 (1983).

⁵ Even at that time, some experts questioned whether safeguards could effectively ensure the accuracy of post-hypnosis testimony used in prosecutions. See ROY UDOLF, *FORENSIC HYPNOSIS: PSYCHOLOGICAL AND LEGAL ASPECTS* 55-56 (1983) (contending that Orne's safeguards "designed to minimize the cueing and leading of a witness inadvertently or otherwise by the hypnotist" fail to "protect against other major sources of distortion" to memory). Several years after *Hurd's* adoption of Dr. Orne's approach, he repudiated his earlier endorsement of safeguards. Martin T. Orne et al., *Hypnotically Induced Testimony*, in EYEWITNESS TESTIMONY: PSYCHOLOGICAL PERSPECTIVES 171, 210 (Gary L. Wells & Elizabeth F. Loftus eds., 1984).

⁶ E.g., Steven Jay Lynn & Michael R. Nash, *Truth in Memory: Ramifications for Psychotherapy and Hypnotherapy*, 36

concerns were overblown.⁷ A 1994 meta-analysis reported that “the data continue[d] to present contradictions in findings regarding hypnosis effects in forensic settings.” Nancy M. Steblay & Robert K. Bothwell, *Evidence for Hypnotically Refreshed Testimony: The View from the Laboratory*, 18 LAW & HUM. BEHAV. 635, 637 (1994). And while some scientists continued to endorse safeguards, others warned that they would be ineffective. Compare D. CORYDON HAMMOND ET AL., CLINICAL HYPNOSIS AND MEMORY: GUIDELINES FOR CLINICIANS AND FOR FORENSIC HYPNOSIS 39-47 (1994), with Robert A. Karlin, *Illusory Safeguards: Legitimizing Distortion in Recall with Guidelines for Forensic Hypnosis—Two Case Reports*, 45 INT’L J. CLINICAL & EXPERIMENTAL HYPNOSIS 18, 18-20 (1997); see Joseph P. Green et al., *Hypnotic Pseudomemories, Prehypnotic Warnings, and the Malleability of Suggested Memories*, 12 APPLIED COGNITIVE PSYCH. 431, 440 (1998).

AM. J. CLINICAL HYPNOSIS 194, 201 (1994); Emily Carota Orne et al., *Memory Liabilities Associated with Hypnosis: Does Low Hypnotizability Confer Immunity?*, 44 INT’L J. CLINICAL & EXPERIMENTAL HYPNOSIS 354, 365-66 (1996) (finding widespread vulnerability to hypnosis-induced memory distortions among subjects at various hypnotizability levels); David Spiegel, *Hypnosis and Suggestion*, in MEMORY DISTORTION: HOW MINDS, BRAINS, AND SOCIETIES RECONSTRUCT THE PAST 129, 140-43 (Daniel Schacter et al. eds., 1995) (describing studies showing that hypnosis produces “more information, both accurate and inaccurate”).

⁷ See, e.g., Nicholas P. Spanos et al., *Hypnotic Interrogation, Pretrial Preparation, and Witness Testimony During Direct and Cross-Examination*, 15 LAW & HUM. BEHAV. 639, 650-52 (1991) (rejecting the contention that hypnosis immunizes subjects from the effects of cross-examination).

B. Following Petitioner’s 1999 Trial, Evolving Research Showed That Hypnotically Enhanced Memories Are Unreliable And That Safeguards Do Not Work.

In the years following petitioner’s trial, scientific opinion on the reliability of hypnotically enhanced memories and the usefulness of safeguards remained unsettled. The percentage of experts professing confidence in such memories was falling, but it was still as high as 45% in 2001. Saul M. Kassin et al., *On the “General Acceptance” of Eyewitness Testimony Research: A New Survey of the Experts*, 56 AM. PSYCH. 405, 410 (2001). But by 2010, “the conclusion that hypnosis can foster false memories” was “indisputable.” SCOTT O. LILIENFELD ET AL., 50 GREAT MYTHS OF POPULAR PSYCHOLOGY: SHATTERING WIDESPREAD MISCONCEPTIONS ABOUT HUMAN BEHAVIOR 73 (2010). That year, a survey of experts reported that 88% either “mostly disagreed” or “strongly disagreed” with the statement that “[h]ypnosis is useful in helping witnesses accurately recall details of crimes” (the other 12% reported that they “didn’t know”). Daniel J. Simons & Christopher F. Chabris, *What People Believe About How Memory Works: A Representative Survey of the U.S. Population*, PLOS ONE, Aug. 2011, at 1, 3 tbl.2.

Additionally, by 2013, it was clear that potentially false memories are likely to be recalled with undue,

inflated confidence.⁸ Steven Jay Lynn, Anne Malaktaris, Sean Barnes & Abigail Matthews, *Hypnosis and Memory in the Forensic Context*, in WILEY ENCYCLOPEDIA OF FORENSIC SCIENCE (ONLINE) 2, 4 (Allan Jamieson & Andre Moenssens eds., 2013) (noting inflated confidence in more than two-thirds of studies of hypnotically elicited memories that examined confidence);⁹ see also Graham F. Wagstaff et al., *Facilitating Memory with Hypnosis, Focused Meditation, and Eye Closure*, 52 INT'L J. CLINICAL & EXPERIMENTAL HYPNOSIS 434, 446 (2004). The increased findings of overconfidence correlated with new methods for exposing memory hardening in hypnosis subjects. See, e.g., Joseph P. Green & Steven Jay Lynn, *Hypnosis Versus Relaxation: Accuracy and Confidence in Dating International News Events*, 19 APPLIED COGNITIVE PSYCH. 679, 689 (2005) (testing subjects' willingness to change answers when given the opportunity to do so and concluding that previous studies had underestimated the effects of hypnosis on confidence).

⁸ The research landscape on memory hardening began to shift just months after petitioner's trial, with the publication of a seminal study finding that hypnosis subjects "maintained their belief in the reported memories in the face of challenging information." Richard A. Bryant & Amanda J. Barnier, *Eliciting Autobiographical Pseudomemories: The Relevance of Hypnosis, Hypnotizability and Attributions*, 47 INT'L J. CLINICAL & EXPERIMENTAL HYPNOSIS 267, 278 (1999).

⁹ The third of studies that did not find inflated confidence identified other issues: inaccurate or, at a minimum, unimproved recall. Lynn, Malaktaris, Barnes & Matthews, *supra*, at 4.

Evidence now also shows that safeguards intended to make hypnotically enhanced memories reliable do not—and cannot—serve their intended purpose. For example, eliminating suggestive techniques does not ensure accurate recall because, as studies reflect, “the induction of hypnosis itself can engender illusory memories.” Giuliana Mazzoni & Steven Jay Lynn, *Using Hypnosis in Eyewitness Memory: Past and Current Issues*, in 1 HANDBOOK OF EYEWITNESS PSYCHOLOGY: MEMORY FOR EVENTS 321, 324 (Michael P. Toglia et al. eds., 2012). Nor does warning hypnosis subjects about potential memory distortions affect the rate of false memories. Jeffrey S. Neuschatz et al., *Hypnosis and Memory Illusions: An Investigation Using the Deese/Roediger and McDermott Paradigm*, 22 IMAGINATION, COGNITION & PERSONALITY 3, 11 (2003). Indeed, a recent study found that subjects warned of possible false memories accompanying hypnosis had even *less* accurate recall than subjects who did not receive warnings. Michelle N. Dasse et al., *Hypnotizability, Not Suggestion, Influences False Memory Development*, 63 INT’L J. CLINICAL & EXPERIMENTAL HYPNOSIS 110, 116, 125-26 (2015). And other researchers have confirmed that false confidence persists even when hypnotists refrain from suggesting that memory improves following a session. See Wagstaff et al., *supra*, at 446.

Accordingly, in multiple respects, the evidence accumulated today on hypnotically enhanced memories, their unreliability, and the ineffectiveness

of safeguards presents a striking departure from the unsettled state of science that existed before *Rock* and continued after petitioner’s 1999 trial. Scientific findings now clearly show that hypnotically enhanced memories are often unreliable and likely to be held with undue confidence—and safeguards cannot eliminate these problems.

Courts, moreover, have largely tracked evolving scientific research. A majority of States have adopted *per se* inadmissibility rules precluding the prosecution’s use of post-hypnosis testimony. Steven Jay Lynn et al., *Forensic Hypnosis: The State of the Science*, in *PSYCHOLOGICAL SCIENCE IN THE COURTROOM: CONSENSUS AND CONTROVERSY* 80, 80 (Jennifer L. Skeem et al. eds., 2009); *see also State v. Moore*, 902 A.2d 1212, 1227, 1229 (N.J. 2006) (noting that “[t]he theory that hypnosis is a reliable means of improving recall is not generally accepted in the scientific community” and adopting a *per se* inadmissibility standard for hypnotically enhanced testimony).¹⁰ Texas, however, continues to use the outdated safeguard approach, ignoring alarms sounded in a recent Texas Court of Criminal Appeals dissent calling for a *per se* ban on post-hypnosis testimony because “[h]ypnosis has been discredited . . . as a forensic discipline to uncover forgotten

¹⁰ The *Moore* decision, which is typical of the current judicial approach in most States, abrogated *Hurd*, 432 A.2d 86, the 1981 New Jersey case cited by this Court in *Rock*, 483 U.S. at 58 n.16, that shaped States’ early—and now mostly abandoned—safeguard approaches. *See, e.g., Zani*, 758 S.W.2d at 239 n.4, 243-44.

memories of crimes.” *Ex parte Chanthakoummane*, WR-78, 107-02, 2020 WL 5927445, at *1 (Tex. Crim. App. Oct. 7, 2020) (Newell, J., dissenting).

II. MEMORIES DO NOT FORM IN A MANNER THAT ALLOWS RELIABLE RETRIEVAL FOR USE IN A FORENSIC SETTING.

As the current science reflects, hypnosis does not recover memories that are sufficiently reliable for forensic use. To the contrary, hypnosis increases the risk of false, distorted, or even manufactured memories. *See, e.g.*, Brent A. Paterline, *Forensic Hypnosis and the Courts*, 4 J.L. & CRIM. JUST. 1, 6 (2016). And as previously discussed, eyewitnesses who have undergone hypnosis are likely to recall potentially false memories with undue, inflated confidence due to “memory hardening.” These findings are unsurprising in light of the scientific reality of memory formation and retrieval, which explains why confabulation and overconfidence are so likely to result from hypnosis.

Memories do not form like frames in a movie that can be assembled and replayed, revealing objective truths about events in the past. Daniel L. Schacter & Elizabeth F. Loftus, *Memory and Law: What Can Cognitive Neuroscience Contribute?*, 16 NATURE NEUROSCIENCE 119, 120 (2013). Decades of research have dispelled notions of the brain as a hard drive or database containing fixed, incorruptible files that need only be accessed to “see” truths. Instead, memory is

selective and fragile. The human mind does not store all of the stimuli it receives, and what is stored may not be stored perfectly. Thus, it is possible that memories targeted during hypnosis formed inaccurately in the first place or never formed at all. And the processes through which individuals create and retrieve memories, by nature, invite distortion and, in some instances, outright confabulation.

A. Unlike A Fixed Video Of Past Events, Memory Is Malleable And Forms Through A Reconstructive Process.

Though sufficiently reliable for everyday concerns, memory is selective and fragile. It is “not an exact reproduction of past experiences but is instead an imperfect process that is prone to various kinds of errors and distortions.” Daniel L. Schacter et al., *Memory Distortion: An Adaptive Perspective*, 15 *TRENDS COGNITIVE SCIS.* 467, 467 (2011) [hereinafter Schacter et al., *Memory Distortion*].

The notion that hypnosis can assist memory recall rests on the faulty assumption that memories are like video recordings, readily accessible to play back once accessed with proper tools. Steven Jay Lynn et al., *Creating The “Stuff of Experience”: Spontaneous Thoughts, Memory, and Hypnosis in Clinical and Forensic Contexts*, in *CREATIVITY AND THE WANDERING MIND: SPONTANEOUS AND CONTROLLED COGNITION* 159, 170 (David D. Preiss et al. eds., 2020) [hereinafter Lynn et al., *Stuff of Experience*]. While this “video recorder” myth of memory may fuel plot lines in pop culture and

retain some misguided, popular appeal, it bears no resemblance to the scientific reality of how memory actually functions. Schacter & Loftus, *supra*, at 120.

Instead, memory is “an active reconstructive process.” Robert Nitsch & Frank W. Stahnisch, *Neuronal Mechanisms Recording the Stream of Consciousness—A Reappraisal of Wilder Penfield’s (1891-1976) Concept of Experiential Phenomena Elicited by Electrical Stimulation of the Human Cortex*, 28 CEREBRAL CORTEX 3347, 3348 (2018). Cognitive and biological theorists agree that “memories do not preserve a literal representation of the world; memories are constructed from fragments of information that are distributed across different brain regions, and depend on influences operating in the present as well as the past.” Daniel L. Schacter, *Illusory Memories: A Cognitive Neuroscience Analysis*, 93 PROC. NAT’L ACAD. SCI. U.S. 13527, 13527 (1996) [hereinafter Schacter, *Illusory Memories*]. Thus, “it is now widely recognized” that memories are not comprehensive records of human experiences. Schacter et al., *Memory Distortion*, *supra*, at 467. Rather, memory is “an imperfect process that is prone to various kinds of errors and distortions.” *Id.*

Even when memories are partly accurate, they often contain unrelated elements that are reconstructions of past events rather than true recollections. See Henry L. Roediger, III, & Kurt A. DeSoto, *Psychology of Reconstructive Memory*, in 20 INTERNATIONAL ENCYCLOPEDIA OF THE SOCIAL & BEHAVIORAL SCIENCES 50 (James D. Wright ed., 2d ed. 2015). Memory relies on the brain’s capacity to

structurally and chemically adapt, and the brain can translate only a fraction of external stimuli into actual memories. See Dominik Aschauer & Simon Rumpel, *The Sensory Neocortex and Associative Memory*, in 37 CURRENT TOPICS BEHAV. NEUROSCIENCE 177, 178 (Robert E. Clark & Stephen J. Martin eds., 2018). The remainder of an individual memory is then reconstructed through a process where the brain “fill[s] in the gaps” with what it expects to be presented. See Jeffrey S. Neuschatz et al., *Memory Gaps and Memory Errors*, in EMERGING TRENDS IN THE SOCIAL AND BEHAVIORAL SCIENCES 1, 2 (Robert Scott & Stephen Kosslyn eds., 2015). And it is that gap-filling propensity that triggers unreliability. Even when “verbatim” memories are encoded into memory, they fade rapidly and people tend to rely on gist memories that are not literal copies of experienced events. Valerie F. Reyna et al., *How Fuzzy-Trace Theory Predicts True and False Memories for Words, Sentences, and Narratives*, 5 J. APPLIED RSCH. MEMORY & COGNITION 1, 2, 8 (2016).

B. Memory Retention And Retrieval Occurs In Three Stages That Present Numerous Opportunities For Memory Failure Or Corruption.

Memory is the continuous process of information retention and its subsequent retrieval. See Reto Bisaz et al., *The Neurobiological Bases of Memory Formation: From Physiological Conditions to Psychopathology*, 47 PSYCHOPATHOLOGY 347, 347-51 (2014). Memory formation occurs in three primary stages: (1) encoding;

(2) synaptic consolidation and storage; and (3) retrieval. Karim Nader, *Reconsolidation and the Dynamic Nature of Memory*, COLD SPRING HARBOR PERSPS. BIOLOGY, Oct. 2015, at 1, 1. This process is not perfect—rather, each stage is prone to “various kinds of errors and distortions.” Schacter et al., *Memory Distortion*, *supra*, at 467. Consequently, each phase on its own illustrates the selectivity and fragility of memory.

Stage One—Selective Encoding: Memory includes only those aspects of experience that the brain “encodes.” Encoding is the process through which external stimuli are translated into information that the brain can better process. See PETER C. BROWN ET AL., MAKE IT STICK: THE SCIENCE OF SUCCESSFUL LEARNING 72, 100 (2014). During encoding, a stimulus is perceived and retained in short-term memory, and a new “memory trace” is formed. See *id.* at 100; Yadin Dudai & Richard G.M. Morris, *Memorable Trends*, 80 NEURON 742, 742 (2013).

This stage is inherently limited. Only a fraction of all outside stimuli—the things individuals see, hear, feel, or otherwise sense—is encoded. At this point, the new trace is fragile and highly susceptible to “interference” from pharmacological, molecular, or behavioral sources. Bisaz et al., *supra*, at 348. Rather than document an “‘actual’ event,” encodings “reflect an individual’s prior knowledge, focus of attention, interests, motives, comprehension, and so on.” Marcia K. Johnson et al., *The Cognitive Neuroscience of True and False Memories*, in TRUE AND FALSE RECOVERED MEMORIES: TOWARD A RECONCILIATION OF THE DEBATE 15, 18 (Robert F. Belli ed., 2012).

Although individuals can encode minor details if they attempt to do so, it is impossible to encode all the details of an event. See Roberto Cubelli, *A New Taxonomy of Memory and Forgetting*, in FORGETTING 35, 42 (Sergio Della Salla ed., 2010). Thus, individuals may encode only those details of events that stand out as unusual or potentially useful in the future. Daniel L. Schacter & Donna Rose Addis, *The Cognitive Neuroscience of Constructive Memory: Remembering the Past and Imagining the Future*, 362 PHIL. TRANSACTIONS ROYAL SOC'Y 773, 778 (2007).

Stage Two—Consolidation and Storage: After the encoding phase, much of the information received and stored in short-term memory is dumped due to limited capacity, with only the most salient information getting stabilized and “consolidate[d]” with the brain’s “preexisting knowledge networks.” See Björn Rasch & Jan Born, *About Sleep’s Role in Memory*, 93 PHYSIOLOGICAL REV. 681, 683, 693 (2013); Marion Quinn Lewis, *Short-Term Memory Items in Repeated Free Recall*, 10 J. VERBAL LEARNING & VERBAL BEHAV. 190, 190 (1971).

Consolidation prepares a memory for storage through neural processes that “stabiliz[e]” memory traces. Rafaël Roesler & James L. McGaugh, *Memory Consolidation*, in ENCYCLOPEDIA OF BEHAVIORAL NEUROSCIENCE 206, 207-08 (George F. Koob et al. eds., 2010). Consolidation encompasses two processes: (1) synaptic consolidation—the initial changes in synapses and neuronal circuits that occur within hours of encountering a stimulus; and (2) systems

consolidation—the reorganization of the brain’s memory systems over a longer period of time. Larry R. Squire et al., *Memory Consolidation*, COLD SPRING HARBOR PERSPS. BIOLOGY, Aug. 2015, at 1, 2. Synaptic consolidation forms short-term memories; systems consolidation forms long-term memories. *See* Roesler & McGaugh, *supra*, at 209-10. Consolidation is a time-dependent process: Synaptic consolidation may be susceptible to outside influence for several hours after the experience. *See* James L. McGaugh, *Time-Dependent Processes in Memory Storage*, 153 SCIENCE 1351, 1357 (1966). Long-term, systems consolidation, by contrast, continues for several weeks. *See* Yadin Dudai, *The Neurobiology of Consolidations, Or, How Stable is the Engram?*, 55 ANN. REV. PSYCH. 51, 54-55 (2004).

Stage Three—Retrieval and “Updated” Memories: Retrieval is the process of recalling a stored memory. Rasch & Born, *supra*, at 683. Retrieval itself is not as simple as finding the video “tape” in storage; instead, it is a “constructive process.” Schacter, *Illusory Memories*, *supra*, at 13527. Retrieval requires “reactivating” the memory through “neural activity corresponding to information previously learned.” Donna J. Bridge & Ken A. Paller, *Neural Correlates of Reactivation and Retrieval-Induced Distortion*, 32 J. NEUROSCIENCE 12144, 12144 (2012).

When a memory is recalled, it enters a state of temporary “postretrieval fragility,” and reconsolidation can distort the memory. Bisaz et al., *supra*, at 348; Sam McKenzie & Howard Eichenbaum, *Consolidation and Reconsolidation: Two Lives of Memories?*, 71 NEURON 224, 224 (2011) (explaining that reconsolidation subjects a newly consolidated memory “to modification through subsequent reminders and interference”); Bridge & Paller, *supra*, at 12144-51. Researchers used to believe a memory, once consolidated, became fixed in the mind; however, scholarship over the past fifteen years has “shown that a [consolidated] memory . . . can again become labile if it is reactivated.” Bisaz et al., *supra*, at 348.

In other words, the synaptic processes that occur whenever an individual tries to remember events also render those memories susceptible to distortion. The mere act of retrieving a memory “promote[s] encoding and storage of the *retrieval event* itself”—creating opportunities for the mind to blend aspects of the retrieval process with the encoded, consolidated, and stored stimuli from past events. See Bridge & Paller, *supra*, at 12149 (emphasis added); see also Linda A. Henkel, *Erroneous Memories Arising from Repeated Attempts to Remember*, 50 J. MEMORY & LANGUAGE 26, 44 (2004). Retrieval can fundamentally alter a memory, which has led to the conclusion that “memories are not fixed entities but are instead a dynamic process for updating memories.” Jonathan L.C. Lee et al., *An Update on Memory Reconsolidation Updating*, 21 TRENDS COGNITIVE SCIS. 531, 531 (2017).

III. POPULAR MYTHS ABOUT MEMORY, OVERCONFIDENT WITNESSES, AND THE UNRELIABLE AND EFFECTIVELY UNTESTABLE NATURE OF POST-HYPNOTIC RECOLLECTIONS SHOULD PRECLUDE FORENSIC USE OF HYPNOSIS, ESPECIALLY BY LAW ENFORCEMENT.

The fragile and reconstructive reality of memory explodes the myth of a video recorder in the brain, just waiting for someone to push “play” to access a documentary of past events. Yet the video view of memory retains traction among the general public and too often infects criminal investigations and prosecutions in multiple respects.

Expectancies about memory—even if misguided—shape how an eyewitness responds to hypnosis, how that eyewitness testifies about post-hypnosis recollections, and how that testimony is perceived in court. For example, an eyewitness who testifies about hypnotically elicited recollections she believes she “watched” while hypnotized may exude heightened confidence that in turn persuades jurors to trust her testimony. And if jurors expect memory to function like a documentary that the confident witness watched during hypnosis, that testimony’s impact grows. Plus, if opposing counsel is then unable to expose the inaccuracy or falsity of the testimony due to the witness’s memory hardening and overconfidence, the testimony may become all but conclusive—even if it does not reflect the truth. And if law enforcement conducts the underlying hypnosis session, further expectancy distortions ripple throughout the case. The

stakes are too great to allow forensic use of hypnotically elicited memories that are unreliable yet profoundly impactful on a jury.

A. Erroneous Expectancies About Memory And Witness Confidence Skew The Impact Of Post-Hypnosis Testimony That May Be Distorted Or False.

Although the video-recorder theory of memory has been thoroughly discredited in the scientific community, that myth retains popular traction. In a survey published in 2011, 63% of respondents agreed that “[h]uman memory works like a video camera, accurately recording the events we see and hear so that we can review and inspect them later.” Simons & Chabris, *supra*, at 1, 3 tbl.2. Similarly, 66.7% of undergraduate students responding to a 2014 survey agreed that “[m]emory of everything experienced is stored permanently in the brain,” with 44.6% further believing that “[h]ypnosis can accurately retrieve memories that previously were not known to the person.” Lawrence Patihis et al., *Are the “Memory Wars” Over? A Scientist-Practitioner Gap in Beliefs About Repressed Memory*, 25 PSYCH. SCI. 519, 521 tbl.1 (2014).

As a result, eyewitnesses to a crime who do not recall details about the event may, like many people, be under the mistaken impression that hypnosis will uncover objectively truthful images stored safely in the recesses of the mind. And that “expectancy” can have

a dramatic impact on a witness's retrieval efforts. *Cf.* Edward R. Hirt et al., *Expectancy Effects in Reconstructive Memory: When The Past is Just What We Expected*, in *TRUTH IN MEMORY* 62, 83 (Steven Jay Lynn & Kevin M. McConkey eds., 1998) (discussing expectancy effects on memory retrieval generally).

Subjects who view hypnosis as some sort of truth pill develop a more “lax criterion” for recollections reported to the hypnotist, “giving . . . additional details about which [subjects] were previously unsure, resulting in increases in incorrect information.” Graham F. Wagstaff et al., *Reducing and Reversing Pseudomemories with Hypnosis*, 25 *CONTEMP. HYPNOSIS* 178, 179 (2008). Thus, while hypnosis may increase the “quantity of information” a subject reports, that additional information “consists of both new accurate *and inaccurate* material.” Emily Carota Orne et al., *supra* at 355 (emphasis added); *see also* Graham F. Wagstaff, *Hypnotically Induced Testimony*, in *ANALYSING WITNESS TESTIMONY: A GUIDE FOR LEGAL PRACTITIONERS AND OTHER PROFESSIONALS* 162, 166 (Anthony Heaton-Armstrong et al. eds., 1999) (discussing “a fairly overwhelming body of experimental evidence” that hypnosis does not improve subjects’ memory *accuracy*). Moreover, when a subject believes that memory is a video recording and hypnosis is a truth pill, that subject is likely not only to disclose additional, partially—or wholly—

inaccurate details, but also to believe them with heightened confidence. See Lynn et al., *Stuff of Experience, supra*, at 171-72.

Whereas positive expectancies about hypnosis in psychotherapy may yield beneficial outcomes regarding chronic pain, anxiety, or addiction,¹¹ expectancies that hypnosis produces accurate memories pose grave dangers when imported into a forensic setting. See Emily Carota Orne et al., *supra*, at 366 (cautioning against use of hypnosis in contexts where “the truth value of the material is important”). First, a direct correlation exists between the confidence of a testifying witness and a jury’s willingness to accept as true the information described by that witness. Second, traditional cross-examination techniques designed to expose inconsistencies and false aspects of a witness’s testimony can be ineffective when that testimony consists of unnaturally hardened, post-hypnosis memories.

First, juries assign significance to witness confidence. In eyewitness identification cases, a witness’s confidence in her testimony is an important factor in convincing jurors that the witness correctly identified a culprit. See R. C. L. Lindsay et al., *Can People Detect Eyewitness-Identification Accuracy Within and Across Situations?*, 66 J. APPLIED PSYCH. 79, 86-87 (1981). Indeed, a witness’s confidence can lead jurors

¹¹ For an in-depth discussion of medical applications of hypnosis, see generally HANDBOOK OF MEDICAL AND PSYCHOLOGICAL HYPNOSIS: FOUNDATIONS, APPLICATIONS, AND PROFESSIONAL ISSUES (Gary R. Elkins ed., 2017).

into “overbelieving” a witness’s identification of a defendant, even when that witness’s testimony is inaccurate. *See id.*

Studies support this notion. For example, a 2009 study found that 37.1% of the general public agreed with the statement: “In my opinion, the testimony of one confident eyewitness should be enough evidence to convict a defendant of a crime.” *See* Simons & Chabris, *supra*, at 1-3 & tbl.2. All experts, faculty researchers, and graduate students involved in this study disagreed with that statement. *Id.* The upshot is that jurors are likely to believe a witness who testifies confidently—even when the testimony consists of a hypnotically induced, false memory. Moreover, if jurors buy into the myth that memory is a video recording and hypnosis is a truth pill, they are already predisposed to believe that a witness’s inherently unreliable, post-hypnosis recollections offer actual snapshots of objective truth.

Second, cross-examination has proven ineffective at exposing and counteracting overconfidence and popular myths about memory. By the time of trial, a false memory elicited through hypnosis will have “hardened.” Paterline, *supra*, at 6. Hypnosis “generally fixes one particular version of the testimony in the witness’s mind which is then faithfully and reliably reproduced every time.” Martin T. Orne, *The Use and Misuse of Hypnosis in Court*, 3 CRIME & JUST. 61, 94 (1981) [hereinafter Orne, 1981 *Use and Misuse*]; *see also* Paterline, *supra*, at 6.

Even if the witness is someone “whose credibility would easily have been destroyed by cross-examination” prior to hypnosis, that same witness, after hypnosis, may be “impervious to such efforts.” Orne, 1981 *Use and Misuse*, *supra*, at 94; *see also* Paterline, *supra*, at 6. Thus, a witness’s unwarranted confidence in a false version of events may “render[] cross-examination largely ineffective.” *Moore*, 902 A.2d at 1221.

If a witness’s undue confidence renders cross-examination ineffective, that witness’s testimony will seem unassailably authentic—providing just the type of evidence most likely to sway a jury. *See* Paterline, *supra*, at 6; Lindsay et al., *supra*, at 79, 86-87. Accordingly, there is a grave danger that unreliable, post-hypnotic recollections will drive the narrative of a prosecution yet be impervious to techniques that would have exposed flawed testimony but for the unwarranted confidence boost provided by hypnosis.

B. Expectancies May Cause Further Distortions When Hypnosis Involves Law Enforcement.

Conducting hypnosis in a law-enforcement setting heightens the risk of distorted and false memories that already inheres in any hypnosis session. Subjects may feel the need to please the hypnotist and be helpful, *see* Orne, 1981 *Use and Misuse*, *supra*, at 83, especially if their recollections may be key to convicting a defendant or furthering a criminal

investigation. A hypnotist's use of positive reinforcement—for example, interjecting phrases like “Good,” “Fine,” and “You are doing well”—can shape what the subject reports,” *id.* at 83-84, “particularly in a police interrogation situation.” *Id.* at 83. Once the hypnotist stops reassuring the subject, the subject may wonder what went wrong and seek to be helpful again. *See id.* at 83-84. “It requires only a modest decrease in the level of support to alter subjects’ behavior” and cause subjects to try to regain the interrogator’s approval. *See id.* That is a dangerous dynamic when fragile memories—and an accused’s liberty—are both at stake.

“[T]he more an eyewitness is questioned about details, the more details will be obtained—but with a marked decrease in accuracy.” *Id.* at 76-77. This phenomenon occurs even with non-hypnotized eyewitness, *id.* at 77, but hypnosis offers additional opportunities for distortion. And this may even happen inadvertently when the interrogator knows some information about the event in question. *See id.* at 79-80. For example, an interrogator who knows that two shots rang out at a certain time on a certain date might ask whether the witness heard anything—particularly loud noises—at the precise moment shots, in fact, were fired. *Id.* And that question may be enough for the “responsive hypnotized subject to create the desired ‘memories.’” *Id.* Moreover, when a hypnotized subject receives validation for case-specific details she reports, that builds precisely

the type of overconfidence that often renders cross-examination ineffective at trial. *See id.* at 84, 94. In many respects, therefore, law-enforcement involvement may further skew the already unreliable information hypnosis produces.

The results are particularly problematic when the interrogator overtly encourages a subject to embrace the video-recorder fiction. *See id.* at 81-82 (This “objective” viewing approach to hypnosis “maximizes the potential input of the hypnotist about what is wanted, making it even more likely that the subject’s memories will more closely resemble the hypnotist’s prior conceptions.”). In petitioner’s case, for example, the State’s sole eyewitness was told by the law-enforcement officer who conducted the hypnosis session to imagine her “very own special theater” with a remote control she could use to press “play” and see a “documentary” of the “film of the events” that occurred on the day in question. *See* Pet. 8 (quoting Pet. App. C102-04). Those directives to view hypnosis as a private screening of the contents of a witness’s mind flatly contradict scientific reality and decades of research establishing that hypnosis cannot reliably resolve errors or gaps in memory formation and instead invites new distortions that may result from the act of memory retrieval.



CONCLUSION

The petition for a writ of certiorari should be granted.

Respectfully submitted,

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