

Mental Time Travel:

A practical business and personal research tool for looking ahead

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Abstract

Mental Time Travel uses guided imagination in the “theatre of the mind” to intuitively visualize and explore contingent future patterns. It is a practical approach for wise choosing, and represents a clear way to improve conventional scenario forecasting, strategic planning and marketing research methods — especially when dealing with Just in Time (JiT) business environments.

The questions to be proactively explored in Mental Time Travel can take many forms, depending on the purpose of the researcher and/or client. For example:

- “What may happen if “X” (a decision or policy option) *is* versus *is not* chosen and implemented? In particular, how would it *feel* to live in each such contingent future?
- “Which of two policy options or possible decisions looks and feels better, “X” or “Y”?
- “In a future involving a specific scenario [specified in advance], what significant *impacts* are likely, but perhaps are as yet unrecognized?” How would such impacts *feel*? *Furthermore, how might these impacts manifest* at various levels of aggregation, such as individual, family, work group, subculture/ecology, global culture/ecology?.

The purpose of this white paper is to present a working set of ideas and methodological guidelines to enable professional futurists, market researchers and other professionals to try the method of Mental Time Travel for themselves and their clients. For the convenience of users new to this type of methodology, a “turn-key” script is appended to the main text. Assuming an appropriate set and setting, this script should be feasible to implement by any professional familiar with group facilitation methods.

Keywords

Methodology, guided imagery, guided visualization, guided focusing, focused imagination, futures research, marketing research, scenario, alternate futures, impact assessment, contingent forecasting, just-in-time, wild-card.

1.0 Background

Guided imagery is a well-known approach for tapping one's intuition in ways that integrate cognitive, affective, and somatic aspects of being [1]. It is a robust approach having a variety of applications for futures research and education [2] as well as creativity [3], and it can be especially useful for the types of "disciplined imagination" recently considered by Chermack [4] with regard to scenario and theory construction.

The use of guided imagery methods – including Mental Time Travel – as an approach to futures research was first developed by the author during the early 1970s when he was a research futurist with the Management and Social Systems Group at Stanford Research Institute (now SRI International). We recognized that exploration and assessment of alternative futures involving societal *transformation* (later termed "paradigm change"), need a robust intuitive capacity to complement more conventional rational-analytic modes of thinking. After some investigation, guided visualization methods appeared to be an "appropriate technology" for this purpose.

In order to ramp up our team's operational expertise with these "visionary" tools, I assembled an informal team of my immediate SRI colleagues to serve as a pilot beta-test group. Our method of operation was simple. Each Friday, in the early afternoon after lunch, we would leave the office and gather at a nearby residence. Then, while having light refreshments, we would talk about our ongoing research projects with an eye toward selection of interesting research questions that might be illuminated by the visionary/intuitive procedures I was developing. After selecting several interesting targets for investigation, I would envision a specific method of approach to use in our afternoon's work and we would begin.

By way of illustration, in one session we decided to visually explore possible smog levels in the future. After first using a type of

relaxation and mental focusing useful for putting us in the right state of consciousness for this type of visionary/intuitive exploration, we each imagined crawling into the same ten foot diameter eyeball—what nowadays might be called a "virtual time machine." Once inside, we collectively “flew” to various space/time locations, such as over the Los Angeles basin at an altitude of 2,000 feet in the year 2020. After each person looked around independently, we compared notes on what we saw. The results were then be used to help guide the more analytically-oriented futures research we did back at the office the following week.

One of the participants in the group was a somewhat hard-bitten SRI transportation engineer who was on loan to our small futures research “think tank” in order to help lead a large alternative futures scenario project on the future of transportation in America which we were currently doing under contract to the U.S. Department of Transportation. He sat in on our Friday afternoon sessions trying to be open-minded, but with a quite skeptical outlook, never having much “visionary stuff” happen for himself personally.

When the project was ending and the transportation scenario team was getting ready to travel to Washington for the briefing of final results to the client, we decided that it would make a good Friday afternoon research project to personally "live through" each of the scenarios that the team had created, so as to get a better sense of what the scenarios might signify for the client. After doing this exercise, we talked about what happened.

The transportation engineer/project leader led off by saying, “*Well, this is the first time that I can say that something really important happened for me in any of these exercises. I don't feel like I learned anything really new; but now, for the first time, I feel really confident about briefing these scenarios to a possibly hostile client audience... because they are now something I can talk about from the heart of my own felt experience, rather than as something that I would have to talk about from only intellectual knowing.*”¹

Then, because we had finished early, with more than a half an hour to go before we usually ended our Friday afternoon sessions, we decided that it might

¹ The physiological basis for this type of experience was recently shown by fMRI research in which it was shown that the same parts of the brain “light up” when remembering a past experience and when envisioning a future experience. This fMRI finding is considered so important that its summary, posted at <http://news-info.wustl.edu/news/page/normal/8448.html> is reprinted here as Appendix Two. The published paper is “Neural substrates of envisioning the future,” by K.K. Szpunar, J.M. Watson and K.B. McDermott, Proceedings of the National Academy of Sciences of the United States, 104 (2007), 642-647, posted online at www.pnas.org/cgi/doi/10.1073/pnas.0610082104.

be a good idea for us to do an exercise in which we all moved forward in time about a week, and watched the forthcoming briefing take place, so as to alert ourselves to anything that might be important to know. When we were in the middle of the visionary briefing run-through, the transportation engineer/project leader suddenly sat upright from where he had been lying on the floor, and said loudly, “*We can't do the briefing this way; it simply won't work!*”

When he explained what it was that he had seen, all agreed that the client would be confused by the plan for the briefing that all were working from. The team immediately redesigned that part of the briefing; then went back into the visionary state of consciousness re-visioned the briefing; and came up with a feeling of quiet joy at having a design they felt confident in. At the next Friday meeting after the team had gone to Washington and returned, all agreed that the briefing went superbly--just as it was "re-visioned" as doing; and that it would have been a disaster to have run the briefing as initially planned.

A variety of such methods were developed while I was at SRI, and further developed and taught at the University of Houston-Clear Lake's graduate program in Studies of the Future Program—both to students in a course called Visionary Futures, and to consulting clients in various business and public settings. The particular method described here is based on suggestions found in a chapter on alternate probable realities in a rather “far-out” book [5] that my SRI research assistant, Ruth Miller, suggested that I take a look at when I was beginning to develop guided imagery methods for futures research.

2.0 The Method

For professional futurists, *impact assessment* – the exploration of both main and side effects that might occur when and if a particular technology, strategy, or series of actions is implemented – is perhaps the most important of the various purposes which the generic approach called “Mental Time Travel” can serve. Both a basic and an advanced version of how Mental Time Travel can be used for impact assessment are described below. For convenience, a ready to use script for the basic method is appended at the end of this paper.

2.1 Basic Method. In its simplest form, the process of using Mental Time Travel for impact assessment consists of the following steps:

1. Choose several alternative policy options or strategies by which to accomplish some objective of significant concern, or alternative scenarios whose impacts are to be discerned. (The method does not work well on trivial material.)

2. Pick one strategy for initial exploration.
3. Relax physically, emotionally, and mentally – accepting the suggestion to avoid thinking in rational, verbal, and/or evaluative terms – to a suitable frame of mind for focused imagistic thinking. Imagine that the strategy is *actually* being implemented at the present moment, and that you are going to explore what it leads to in the future.
4. Using passive volition,² allow yourself to be carried along into the future as the strategy is implemented across time, simply watching and feeling things as they occur. Often it is useful to let yourself be surprised by what futurists call a “Wild Card”—some unanticipated event that is sure to bring strong impacts and effects.
5. After scanning to – or beyond – the desired time frame (or event sequence), record the impressions and questions that seem most relevant.
6. Do Steps 3-5 for each strategy or option deemed of interest, including strategies that you may not support or think would work, but which other persons or interest groups are known to advocate.
7. Decide how next to proceed. Typical “next steps” include one or more of the following:
 - a. Select the option or strategy that seems preferable (often it turns out to be a synthesis of several) on the basis of what you saw and felt.
 - b. Select particular questions or issues that have emerged and may require further exploration, using “visionary/intuitive” or “rational/analytic” modes of thinking, or a combination of both.

2.2 Advanced Method. The above procedure, though easy to learn and quick to do once you have the requisite skills, leaves much to be desired where serious analytic impact assessment studies are concerned. In particular, the basic method offers no direct way to focus on particular areas (“impact categories”) of interest, such as client return on investment or competitive position. The following expansion of the basic method does offer this type of flexibility, but takes longer and requires much greater ability to focus one’s awareness as needed during a sustained sequence of steps. (This ability may be gained by practicing almost any type of meditation that involves concentrated focus for a sustained time.)

In Step 4 of the Basic Method, you are asked to maintain general awareness of all that is relevant as you move through time. In the Advanced Method, you are asked to focus on only one attribute or dimension at a time, repeating your

² *Passive volition* is a term that comes from biofeedback work. It has to do with “letting” rather than “making” something happen. For those familiar with Taoism, this is equivalent to being “yin” rather than “yang” in orientation.

journey as many times as needed in order to cover all areas of interest. The following is a useful sequence for integrative exploration across system levels:

1. Individual – somatic sensations (i.e., impressions related to bodily well-being).
2. Individual – affective sensations (i.e., emotional feelings).
3. Individual – cognitive sensations (i.e., thought impressions).
4. Primary group or most directly impacted party – general sensations or segmented into the three categories of sensations noted above, done one at a time.
5. Other affected groups or interested parties – general or specific sensations.
6. Groupings at larger levels of aggregation (e.g., nation, society, culture, world, etc.)—general or specific sensations.

NOTE: As in the process called “voice dialogue” [6], it is surprisingly easy and meaningful to experience affective or cognitive impressions *vicariously*, on behalf of a work team, a client organization, a competitor, a mass movement, a society, an ecological niche or whole system, a planet..., and to experience them as bodily, mental and/or emotional feelings, and even metaphysical and/or spiritual levels of impact, should the user be so inclined.

3.0 Case Examples

Two brief case examples of using Mental Time Travel are as follows:

3.1 Proactive career analysis by an individual

Several years ago, a young psychotherapist in the Houston area came to the author’s consulting office in order to shed light on whether he should refocus his career, and if so, how. Feeling quite burned out by continued working in a managed health care system that he experienced as increasingly resource-squeezing and demeaning, he wanted out—but he didn’t know what career path would be best to take. He came to me for an intuitive way to look into the future ramifications of choosing one versus another career path.

After first going through a hour-long sequence of processes designed to put him in touch with the values and career paths he felt most drawn toward, he formulated the following two options to explore:

1. Leave the managed care system, but continue the practice of psychotherapy with an emphasis on personal coaching, as an independent practitioner in Houston’s burgeoning business community.
2. Leave behind the professional practice of psychotherapy, and commercially develop an avocation he loved: that of oil and acrylic portrait painting of high-end yachts in the Gulf Coast area, and the writing of personalized poems that

he framed to go with the portrait—something that worked quite well when he tried it on weekends.

After two Mental Time Travel trips through the future – each of which involved the felt intention to enact one or the other of the above two options – he compared the each, then asked if there is a third option that might maximize the best features and minimize the worst features of each.

In the end, he chose a third path – that of moving to Austin, where he joined a family therapy group practice, and where he could greatly expand his artistic endeavors beyond what he had done in the past. Interestingly, his wife did a parallel set of processes, which also led her to see Austin as where she wanted to go as well. This close similarity of results for the couple is not particularly unique. Not infrequently, when these tools are used for purposes of strategic team development in business settings, many team members independently experience content that has a high degree of similarity, leading to synchronistic team alignment.

3.2 Policy analysis and alignment of viewpoints across different levels of management in a multi-national corporation

A second case example involves a team from a large automotive and electronic data systems corporation who came to UHCL to learn state-of-the-art tools of applied futures research. Membership in the team included an assistant vice president, a department head and several staff professionals. As we were discussing various visionary futures research tools, the group decided that they would like an experiential introduction to the method described above as Mental Time Travel. Since the group had just several hours before involved themselves in a frustratingly inconclusive discussion regarding “Third World” policy implications for their global corporation, the policy option chosen for investigation of this futures method focused on this question:

“What would the future of our company and of the world look like if major ‘First World’ Corporations such as us [do versus do not] strategically embrace the poverty-stricken ‘Third World’ nations and cultures as customers (i.e., not just as the source of low-cost labor)?”

Our exercise was attended by all of the corporate team members plus two UHCL futures faculty and several graduate students and alumni. Two Mental Time Travel journeys (one for each policy option) were facilitated by the author, who first described the process, then gave appropriate instructions for relaxation and focusing. Various frames of reference and time horizons to experience were

suggested as the participants imaginatively journeyed through two different futures: one representing the “do” and one representing the “do not” policy options, regarding the embrace of the Third World as a strategic customer base by First World corporation.

The results were clear cut. All participants, both corporate team members and academic participants, experienced much the same thing. Our conclusion? Globally, “the chain” of human systems is only as strong as its weakest link. In the very long term, sustainable growth and well-being is dependent on the well-being of all nations, not just the ones that have a good shot at becoming prosperous. Thus, it is clear that developing a Third World customer base is essential.

The corporate team, in mulling this over came to an additional conclusion: The strategic question that should be focused on is not: Whether or not the corporation should move in this direction; Rather, it needs to be: How might it be feasible to help leaders at all levels in our corporation to experience and see this for themselves, so that meaningful progress in this direction might become feasible to achieve? Obviously, Mental Time Travel would be a way to do this, but the team members saw this as politically too risky to recommend to their corporate superiors, so the matter was dropped, and the team continued their brief experiential survey of futures research and forecasting methods.

4.0 Discussion

To the practicing futurist, the substantive conclusions reached in the above examples are not at all very startling. Of much greater interest is the fact that when most or all members of the group experience the same type of result in a facilitated “time travel” exercise in the theater of their own imaginations, an alignment of widely diverging points of view can occur, and one that feels like their own personal experience. The corporate team in the second case example noted above, for example, spanned an ideological spectrum from economic conservative to ecology activist. And yet the conclusions reached in the exercise transcended such ideological differences, by experientially tapping “core values” common to all.

Similarly, when using this method in conventional corporate settings, all participants typically agree that the method is robust, but that a receptive political climate for its use needs to be developed early in the process so that results can be communicated in a credible way. In retrospect, it is interesting to recall how back in the 1970’s, our research team at SRI chose not to cite our use of these “visionary methods” in the methodology section of our reports for fear of losing credibility with clients who already felt a bit vulnerable to criticism for embracing

alternative futures thinking. The discernment whether or not such reservations exist in a prospective client community is an important part of the contracting process leading to this type of work in politically sensitive settings.

Hopefully, these brief examples give a taste of the range and robustness that Mental Time Travel offers the working futurist. But because the approach has as yet not really caught on as a way to help clients in different settings to experientially envision possible, probable and preferable futures for themselves and their clients, it is hard to say what the limits will be to which this method will ultimately be constrained. For example, with further development, this method may well come to be recognized as a form of Remote Viewing—a possible approach to futures research recently reviewed by J. H. Lee [7].

5.0 Summary/Conclusion

Focused Imagination tools, including Mental Time Travel, generally represent a clear way to complement and thereby to improve conventional scenario forecasting and strategic planning/assessment methods – especially applicable for Just in Time (JiT) business environments. As such, they have considerable promise as best practices for professional and business leaders looking for leading-edge tools and techniques for wise choosing. They do, however, require a supportive mental set and contextual setting in order to be used appropriately in conventional business or governmental organizations.

Appendix One

Shown below is a script for guiding the basic method. To guide the advanced method, simply substitute the specific attribute (e.g., body, emotions, mind, spirit) or level of aggregation (individual, work group, family, tribe, nation, all mankind, all consciousness) when you say what to focus on as you look for impacts in the journey. In the following script, when **[Option #]** occurs, it is important to insert what ever name you and the client have agreed on as a way to refer to each option. Do **not** say “Option A” or “Option B” when actually guiding the experience! And, be aware of the possible need to spend several minutes taking the group through a systematic process of relaxation if they seem a bit “up tight,” rather than just the few words about relaxation in the script below.

The Script

“Before we begin the actual Mental Journey, I need to ask you some setup questions:

“What do you want to explore the alternative impacts of? For purposes of the clarity, for now we will call them *Option A* and *Option B*.” (Please note that it is often better to have Option A be the alternative that seems closest to “present trends extended” and Option B be what feels like more of a shift, but this is by no means necessary.)”

[Both here at this step and at other steps below, be sure to record what the client reports.]

“Next, you need to decide how you want to travel. (Mental travel can be done in any type of imaginary vehicle that miraculously conveys the rider to distant times and places according to one’s intention; it can be done with no imagined vehicle at all, instead just imagining that all of your senses—and extra-sensory sensitivities—are receptive to whatever needs to be noticed as you proceed.) How do you want to do it? ...

“Finally, it is important to avoid any biasing beliefs or expectations about which of the alternatives you are going to explore is better or best. So before we proceed, imagine some type of “air tight” container in which to put all of your current beliefs and expectations regarding the alternatives. Pick a container that fits for you....and when you get one, tell me what it is. ...

“Good. Now imagine that you had some type of vacuum cleaner that was able to suck up all your biasing beliefs and expectations, and then pump them into the container you picked. ... Then seal it up and set it aside.

You will be able to open it up again at the end of our exercise, but for now, just let all this be out of the way as we proceed.

“Fine. Now I’m going to count down from 10 to 0 as they do at NASA, to help you get ready for the mental journey into the future. You can lift your finger after each number, when you have done what was suggested, and are ready for the next number. Here we go.

Ten... Imagine that you are getting into your vehicle. ...

Nine... Get comfortable and relaxed. ... Very relaxed.

Eight... Let go of any concerns, including concerns about whether this process will work. ...

Seven... Still more deeply relaxed, let go of any thoughts about the future, just be in the present moment. ...

Six ... Relax more and more deeply,

Five ... As you relax still further, gradually begin to hold the intention that **[Option #]**, with the feeling of being totally open about what **[Option #]** may lead to in the future. ...

Four ... Feel yourself really relaxed in the vehicle of your choice. Feeling how comfortable and good it feels to be here, getting ready for the interesting journey in which you will be able to discern all that you need for the journey to be a success. ...

Three... Let your mind become very peaceful but sharply sensitive, and your emotions quite calm, but sensitive as well ...

Two ... Now, get ready for a really interesting journey ...

One ... Ready to proceed. ... With **[Option #]** clearly held as a dominating influence on the future you will be experiencing ...

Zero ... Here we go! Just let yourself have the following experiences ...

“Leaving here after this session has ended. ...

“You are back at home now, sleeping peacefully as another part of you brings back intuition of future realities

“Now you are experiencing your life as it unfolds in the days just ahead, letting the **[Option #]** unfold in whatever way is most likely ... [longer pause]

“Now you are experiencing your life as it unfolds in the months ahead ...
...still further developments of **[Option #]**;

“Be aware of what is happening to other people and other things you care about ... in the months ahead [much longer pause] with many new developments for **[Option #]**.

“Moving on into the years ahead... the longer-term future... experience what is significant in your life also what is happening to other people and other things you care about. ...

“And now, imagine that there is some type of right-angle turn in your journey, a “wild card” shift into something that is surprising to you but that really fits in this particular future you are experiencing, what futurists call “a wild card future.” ... what do you notice first? Is there a specific way in which **[Option #]**, the option you are exploring has morphed into something rather different, perhaps something you never thought of before?

“Good. ... now, as you proceed, imagine that you dimly discern some type of destination out ahead that signifies the end of this journey. ...

“Let yourself be drawn closer and closer to the destination. ... [Very Long Pause] ... And when you get there, turn back and let yourself be aware of the entire journey from the beginning until you got here, and review in your mind the main things you experienced, and the things you would like to remember when this journey is finished. ... Imagine that you are writing in a journal or telling someone about what you experienced on this journey. What are the main things you are describing? Itemize each of them in your mind before we return to normal consciousness, so that you will be able to remember them clearly. [Very Long Pause] ... Just lift a finger or nod your head when you are ready to come back to report out on what you experienced.

“Wonderful. Now come back to normal consciousness. Open your eyes, bend your wrists and your ankles, and be fully back.

“Would you like to report out now? Or journey through the other alternatives, and then report out on all of them at the same time?

“Fine. Before we begin the next journey, I would like you to imagine that you are erasing the intention you had regarding the conditions that set up the journey you just began so that it doesn’t interfere with the next journey.

...

“Good, now create in yourself the intention that the next option, **[Option #]**, is being realized in what we call reality.

“And now, here is the count down for the next journey.”

[Return to “Ten” in the script above, and go on from there.]

[After looking at each of the alternative futures that were initially chosen for exploration, and either before or after reporting out on each of them]:

Before going any further, you might want to go back to the container in which you put all of your beliefs and expectations about the future; and now release them so that you have them back.

“Now, I would like you to compare the strengths and the weaknesses of each of the alternatives in your mind. Is there some synthesis of them all that maximizes the strengths and minimizes the weaknesses? If so, what is it like?

Looking back over the entire experience, what are the main things that stand out for you?

What, in your “real” life, would you do differently as a result of having done this exercise in Mental Time Travel?

That's it!

Appendix Two

[copied from <http://news-info.wustl.edu/news/page/normal/8448.html>.]

[Washington University in St. Louis News & Information](#) > [University News](#) >

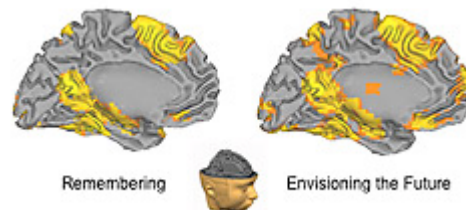
Imaging pinpoints brain regions that 'see the future'

Memory and future thought go 'hand-in-hand'

By Gerry Everding

Jan. 2, 2007 -- Human memory, the ability to recall vivid mental images of past experiences, has been studied extensively for more than a hundred years. But until recently, there's been surprisingly little research into cognitive processes underlying another form of mental time travel — the ability to clearly imagine or "see" oneself participating in a future event.

Now, researchers from Washington University in St. Louis have used advanced brain imaging techniques to show that remembering the past and envisioning the future may go hand-in-hand, with each process sparking strikingly similar patterns of activity within precisely the same broad network of brain regions.



Comparing images of brain activity in response to the "self-remember" and "self-future" event cues, researchers found a surprisingly complete overlap among regions of the brain used for remembering the past and those used for envisioning the future.

"In our daily lives, we probably spend more time envisioning what we're going to do tomorrow or later on in the day than we do remembering, but not much is known about how we go about forming these mental images of the future," says Karl Szpunar, lead author of the study and a psychology doctoral student in Arts & Sciences at Washington University.

"Our findings provide compelling support for the idea that memory and future thought are highly interrelated and help explain why future thought may be impossible without memories."

Scheduled for advance online publication Jan. 1 in Proceedings of the National Academy of Sciences, the study sheds new light on how the human mind relies on the vivid recollection of past experiences to prepare itself for future challenges, suggesting that envisioning the future may be a critical prerequisite for many higher-level planning processes.

Other study co-authors are Jason M. Watson, a Washington University doctoral graduate now assistant professor of psychology at the University of Utah; and Kathleen McDermott, an associate professor of psychology in Arts & Sciences and of radiology in the School of Medicine at Washington University.

McDermott, principal investigator for the University's Memory and Cognition Lab, where the research is based, suggests that the findings are notable for two reasons.

First, the study clearly demonstrates that the neural network underlying future thought is not isolated in the brain's frontal cortex, as some have speculated. Although the frontal lobes play a well-documented role in carrying out future-oriented executive operations, such as anticipation, planning and monitoring, the spark for these activities may well be the very process of envisioning oneself in a specific future event, an activity based within and reliant upon the same neurally distributed network used to retrieve autobiographical memories.

Second, within this neural network, patterns of activity suggest that the visual and spatial context for our imagined future often is pieced together using our past experiences, including memories of specific body movements and visual perspective changes — data stored as we navigated through similar settings in the past.

These findings, McDermott suggests, offer strong support for a relatively recent theory of memory, which posits that remembering the past and envisioning the future draw upon many of the same neural mechanisms. Previous speculation has been based largely on the anecdotal observation of very young children, cases of severe depression and brain damaged persons with amnesia.

"There's a little known and not that well investigated finding that if you have an amnesic person who can't remember the past, they're also not at all good about thinking about what they might be doing tomorrow or envisioning any kind of personal future," McDermott explains. They comprehend time and can consider the future in the abstract sense (e.g., that global warming is a concern for the future), but they cannot vividly envision themselves in a specific future scenario.

"The same is true with very small children — they don't remember particularly what happened last month and they can't really tell you much of anything about what they envision happening next week. This is also the case with suicidally depressed people. So, there's this theory that it all goes hand-in-hand, but nobody has looked closely enough to explain exactly how or why this occurs."

In this study, researchers relied on functional magnetic resonance imaging (fMRI) to capture patterns of brain activation as college students were given 10 seconds to develop a vivid mental image of themselves or a famous celebrity participating in a range of common life experiences.

Presented with a series of memory cues, such as getting lost, spending time with a friend or attending a birthday party, participants were asked to recall a related event from their own past; to envision themselves experiencing such an event in their future life; or, to picture a famous celebrity — specifically former U.S. President Bill Clinton — participating in such an event.

The "Clinton-Imagine" task was introduced to help researchers establish a baseline level of brain activity for a cognitive event that was in many ways similar to the other two tasks but did not involve the mental projection of oneself through time. Bill Clinton was chosen because pre-testing showed he was easy for participants to visualize in a variety of situations.

Comparing images of brain activity in response to the "self-remember" and "self-future" event cues, researchers found a surprisingly complete overlap among regions of the brain used for remembering the past and those used for envisioning the future — every region involved in recollecting the past was also used in envisioning the future.

During the experiment, participants were not required to describe details or explain the origin of mental images elicited by the memory cues, but in post-testing questionnaires most indicated that they tended to place future-oriented images in the context of familiar places (e.g. home, school) and familiar people (e.g. family, friends), which would require the reactivation of those images from neural networks responsible for the storage and retrieval of autobiographical memories.

Conversely, the neural networks associated with personal mental time travel showed significantly less activity when participants imagined scenarios involving Bill Clinton. The reason, researchers suggest, is that participants had no personal memories of direct interaction with Clinton, and thus, any images of him had to be derived from neural networks responsible for semantic memory —

our context-free general knowledge of the world. In fact, participants later reported that their mental images of Clinton tended to be less vivid (e.g. "I see Bill Clinton at a party in the White House, alongside several faceless senators").

"Results of this study offer a tentative answer to a longstanding question regarding the evolutionary usefulness of memory," McDermott concludes. "It may just be that the reason we can recollect our past in vivid detail is that this set of processes is important for being able to envision ourselves in future scenarios. This ability to envision the future has clear and compelling adaptive significance."

References

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