Young and old use different strategies to estimate passage of time, study finds

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New research suggests songs also can distort memories of past events, setting us up to miss future deadlines. Listening to four short songs, as opposed to two long songs, such as “Shout” by The Isley Brothers (4:80) and “Ray of Light” by Madonna (5:35), can fool young people into over-estimating how long it took to

complete the same 11-minute task, new research suggests. Credit: Washington University in St. Louis

A song is just a song, but as time goes by, something as random as a song's length could be the difference in whether you miss an important deadline or arrive late for an appointment, suggests time-management research from Washington University in St. Louis.

The study, published in the *Journal of Experimental Psychology: General*, shows that people rely heavily on time estimates of past experiences to plan for future tasks and that outside influences, such as background music, can skew our perception of time, causing even the best-laid plans to go awry.

"Our results suggest time estimates of tasks that we need to incorporate into our later plans, like a drive to an appointment, are often based on our memory of how long it took us to perform that same drive previously," said Emily Waldum, principal author of the paper and a postdoctoral researcher in psychological and brain sciences in Arts & Sciences.

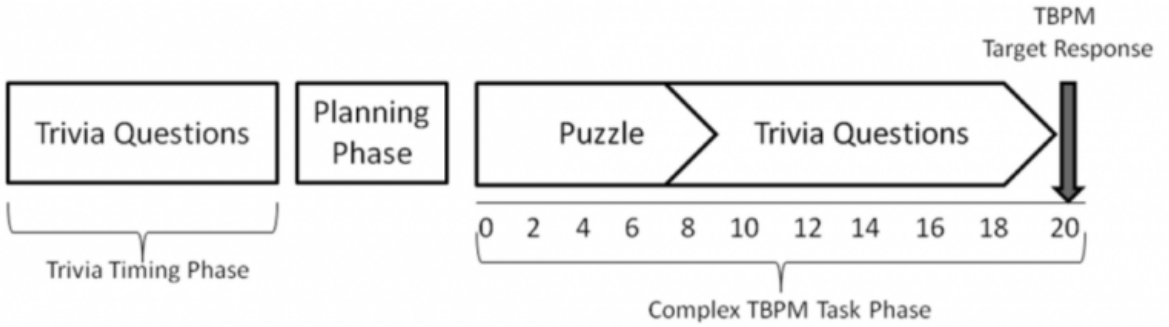
"Even if you think you estimated the duration of events accurately, external factors unrelated to that event can bias time estimates," she said. "Something as simple as the number of songs you heard play on your phone during a run can influence whether you over- or under-estimate the duration of the run."

In a complicated modern world where multitasking is the norm, it's easy for our game plans to fall apart due to breakdowns in "prospective memory," a term psychologists use to describe the process of remembering to do something in the future.

Waldum and co-author Mark McDaniel, a professor of psychological and brain sciences, designed this study to tease out differences in how people young and old approach a challenge that requires them to plan ahead and complete a series of time-based tasks by a specific deadline.

The research included 36 college undergraduates and 34 healthy older adults in their 60s, 70s and 80s. It aimed to simulate the complicated time-based prospective memory (TBPM) challenges that people old and young experience in everyday life.

In the first part of the study, participants were asked to keep track of how long it took to complete a trivia quiz. The quiz always ran 11 minutes, but participants had to make their own time estimates without access to a clock. Some completed the quiz with no background noise, while others heard either two long songs or four short songs.



In this time-based prospective memory (TBPM) experiment, finishing on time requires accurate estimate of time to complete first quiz and remembering to use this estimate when planning a "switch time" for move from puzzle to second quiz. Credit: Washington University in St. Louis

Later, the participants were challenged to put together as many pieces of

a puzzle as possible while leaving enough time to complete the same quiz before a 20-minute deadline.

Contrary to previous research, this study found that seniors managed to complete future tasks on time at about the same rate as college undergraduates, although each age group used surprisingly different strategies to estimate how much time they would need to repeat the quiz and finish the next phase of the experiment on deadline.

Older adults reported ignoring songs heard in the background, relying instead on an internal clock to estimate how long it took them to complete the first quiz. Consistent with other research on internal clocks and time perception, seniors in this experiment tended to underestimate time taken on the first quiz. This led them to spend a little too much time on the puzzle and to finish the second quiz a bit beyond deadline.

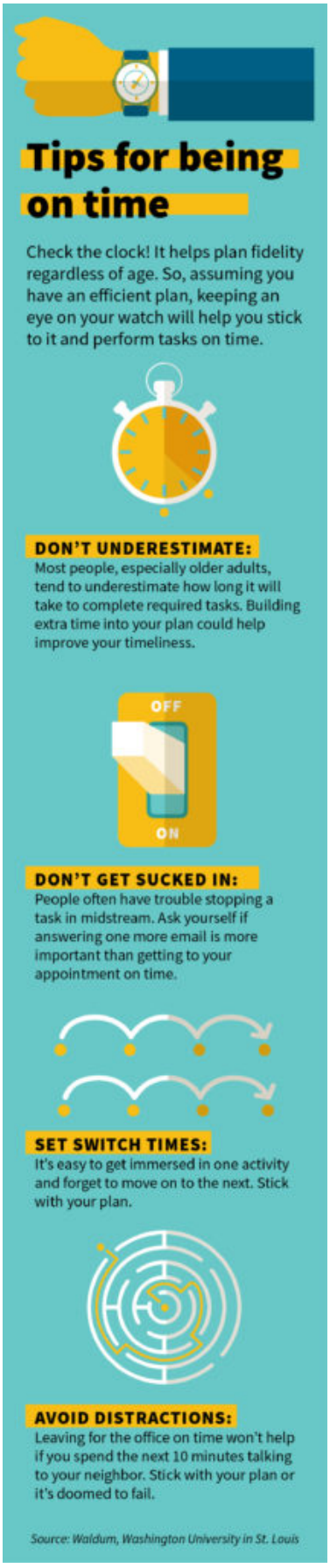
"When younger adults heard two long songs during the first quiz, they performed a lot like older adults, underestimating the quiz duration and winding up a bit late," Waldum said. "When they heard four short songs, younger adults overestimated how much time they would need to repeat the quiz leading them to finish it too early."

Thus, older adults performed about the same, regardless of whether they heard songs or not. For young people though, background music played a big role in whether they were too early or too late, Waldum said.

While the challenges of being on time may remain largely the same throughout a lifetime, this study suggests that the tricks we use to stay on schedule may evolve as we age.

For college students with young, agile minds and no fear of multitasking, using songs to estimate the passage of time may be a plausible approach when no clock is available.

"In a scenario where the duration of a background event is set, such as a 30-minute television show, this is a very good strategy because it provides useful duration information whether you're paying attention to the show or not," Waldum said. "However, when background events are less predictable, as in the case with songs and many other events, basing a time estimate on them can be risky."


Tips for being on time
Check the clock! It helps plan fidelity regardless of age. So, assuming you have an efficient plan, keeping an eye on your watch will help you stick to it and perform tasks on time.
DON'T UNDERESTIMATE:
Most people, especially older adults, tend to underestimate how long it will take to complete required tasks. Building extra time into your plan could help improve your timeliness.
OFF
ON
DON'T GET SUCKED IN:
People often have trouble stopping a task in midstream. Ask yourself if answering one more email is more important than getting to your appointment on time.
SET SWITCH TIMES:
It's easy to get immersed in one activity and forget to move on to the next. Stick with your plan.
AVOID DISTRACTIONS:
Leaving for the office on time won't help if you spend the next 10 minutes talking to your neighbor. Stick with your plan or it's doomed to fail.
Source: Waldum, Washington University in St. Louis

Older adults, who generally see declines in memory and the speed at which they process information, tended to avoid multitasking throughout the study.

During the first quiz, they ignored songs and relied more on an internal clock to make time estimates. In the second phase of the study when a clock was made available, they were less likely to pause working on the puzzle and quiz to check the clock.

These findings suggest that older adults may actually over-rely on their internal clocks that give us a feeling of elapsed time. Checking a clock when it is available is a much better strategy than relying on a feeling of elapsed time, and indeed increased clock-checking predicts better time-based prospective memory performance in this and many other previous studies.

Therefore, even if checking the clock requires some multitasking, it is worth your time, Waldum said.

No matter what challenges the future brings—getting out the door and to work, finishing walking the dog before the cookies are done or purchasing popcorn before a movie starts—the fundamentals of being on time still apply.

You must remember this: Success requires making accurate estimates of the time needed to complete prerequisite tasks, remembering to carry out these tasks at the appropriate time and avoiding distractions that

could prevent you from staying on schedule.

"Our study provides some good news for older adults," Waldum said. "Our results, while preliminary, suggest that time-management ability and the ability to perform some types of complex time-based tasks in real life may largely be preserved with age."

Provided by Washington University in St. Louis