

## Procrastination and Dementia




Cormac Monaghan<sup>1,2</sup>, Rafael de Andrade Moral<sup>3</sup>, and Joanna McHugh Power<sup>2</sup>

<sup>1</sup>Hamilton Institute, Maynooth University, Ireland

<sup>2</sup>Department of Psychology, Maynooth University, Ireland

<sup>3</sup>Department of Mathematics and Statistics, Maynooth University, Ireland

### Author note

Cormac Monaghan,  <https://orcid.org/https://orcid.org/0000-0001-9012-3060>  
Rafael de Andrade Moral,  <https://orcid.org/https://orcid.org/0000-0002-0875-3563>  
Joanna McHugh Power,  <https://orcid.org/https://orcid.org/0000-0002-7387-3107>

### Correspondence

Correspondence concerning this article should be addressed to Cormac Monaghan ([cormacmonaghan@protonmail.com](mailto:cormacmonaghan@protonmail.com)), Hamilton Institute, Maynooth University, Ireland, ; Department of Psychology, Maynooth University, Ireland,

## Procrastination and Dementia

Dementia is a syndrome characterized by the progressive and typically irreversible decline of cognitive function, leading to memory loss, impaired reasoning, and difficulties with daily activities (Prince et al., 2013; Sanz-Blasco et al., 2022). It encompasses a range of conditions, including Alzheimer's disease, vascular dementia, and Lewy body dementia (Cao et al., 2020). The global burden of dementia is substantial, with projections suggesting that the number of affected individuals will rise from 57.4 million in 2019 to 152.8 million by 2050 (Nichols et al., 2022). Given this projection, identifying and addressing modifiable risk factors is crucial to mitigate the growing prevalence of dementia worldwide.

Given the progressive nature of dementia, early identification of pre-dementia conditions such as mild cognitive impairment (MCI) is essential for timely intervention. MCI is a condition characterized by cognitive changes - such as memory lapses or difficulty making decisions - that exceed typical age-related decline (Abner et al., 2012; Cooper et al., 2015; Fresnais et al., 2023; Salem et al., 2023; Yu et al., 2013). Studies indicate that approximately 46% of people with MCI transition to dementia within three years and approximately 80% within six years (Cooper et al., 2015; Shigemizu et al., 2020; Tschanz et al., 2006). As such, identifying factors that influence this progression is critically important for early intervention and personalized care.

Among the behavioural symptoms in MCI and dementia, apathy is one of the most prevalent (Dalen et al., 2018; Fresnais et al., 2023; Richard et al., 2012; Salem et al., 2023). Defined as a lack of motivation (Fresnais et al., 2023), apathy is also a multidimensional construct that encompasses deficits in executive and emotional functioning, initiation, and increased

functional impairment (Okura et al., 2010; Radakovic & Abrahams, 2018). Individuals with apathy exhibit reduced goal-directed behavior and a diminished desire to pursue rewards or pleasure (Fahed & Steffens, 2021). Importantly, apathy has been identified as a significant risk factor for the transition from MCI to dementia (Dalen et al., 2018; Palmer et al., 2010; Ruthirakuhan et al., 2019). For instance, a meta-analysis by Dalen et al. (2018) found that apathy almost doubles the risk of transitioning to dementia. Additionally, apathy has been correlated with higher levels of neurofibrillary tangles in individuals with dementia, suggesting a potential connection to underlying neuropathology (Skogseth et al., 2008).

Procrastination, although traditionally viewed as a distinct behavioural issue, may share key characteristics with apathy, suggesting potential common underlying mechanisms. Chronic procrastination, characterized by persistent delays in decision-making and task completion (Abbasi & Alghamdi, 2015; Ferrari, 2010), has been associated with dysfunction in the brain's reward and decision-making systems, particularly the dorsolateral and ventromedial prefrontal cortices (Fridén, 2020; Zhang et al., 2019). These brain regions are critical for both initiating and sustaining goal-directed action and are areas where both apathy and procrastination show deficits (Fahed & Steffens, 2021; Zhang et al., 2019).

While apathy primarily reflects a lack of motivation, procrastination involves a delay in action despite an intention to complete such action (Steel, 2007). Both behaviours suggest impaired executive function, particularly in goal-oriented behaviour and decision-making, which are hallmark deficits in MCI and dementia (Kirova et al., 2015; Stopford et al., 2012). In this context, procrastination could reflect broader motivational and cognitive impairments akin to those seen in apathy.

Given these parallels, it is worth exploring whether chronic procrastination could serve as an early behavioural marker for cognitive impairment, or even a risk factor for dementia, especially in older adults. Procrastination may exacerbate existing cognitive decline by reinforcing patterns of inaction and passivity. Individuals who chronically delay tasks may inadvertently engage in fewer cognitively stimulating activities, such as physical activity, problem-solving, decision-making, and goal-setting—activities that are known to build cognitive resilience and reduce dementia risk (Chowdhary et al., 2022). By limiting engagement in such activities, procrastination could contribute to the acceleration of cognitive decline. Therefore, while apathy has already been established as a significant risk factor for dementia, the role of procrastination, especially when chronic, may represent an overlooked behavioural trait that warrants similar attention.

Although current research on procrastination in relation to dementia is non-existent, this possible association warrants exploration. Identifying procrastination as a potential risk factor could expand the scope of early interventions aimed at preventing or slowing the progression of dementia. As such, the purpose of this study was to test the hypothesis that higher levels of procrastination would be associated with an increased probability of transitioning from normal cognitive function or MCI to dementia.

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