IDENTIFYING MOOD- AND AGE-RELATED DIFFERENCES IN ATTENTIONAL BIASES IN DYSPHORIA: AN EYE TRACKING STUDY

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To Steve, Oscar, and Felix

I love you all the love in the world

ABSTRACT

Previous research has indicated that individuals who experience depression selectively attend to negative information for greater periods of time than non-depressed individuals. This negative bias may reflect difficulty disengaging from negative stimuli that is not seen in non-depressed individuals. While there has been a high level of researcher interest in this arena, no studies have investigated the presence of a negative bias in older adults. Accordingly, the present study employed eye tracking techniques to investigate differences in negative biases between dysphoric (n = 27; 14 younger adults; 13 older adults) and non-dysphoric (n = 29; 14 younger adults; 15 older adults) participants by presenting competing emotionally valenced stimuli. In an additional stage of the experiment, the presence of an interpretation bias was investigated whereby participants rated the previously viewed images for perceptions of 'mood'. Results from the eye tracking task were mixed, with partial support being found for a negative bias in dysphoric participants. Similarly, partial support was found for the hypothesis that non-dysphoric participants would attend to positive stimuli for greater periods of time than dysphoric participants. No age-related differences were found in the non-dysphoric group when attending to sad and happy images. However, when attending to sad images, younger dysphoric participants showed greater average glance durations than older dysphoric participants. Results from the rating task were also mixed. No evidence of a negative interpretation bias was found in the dysphoric group. Similarly no evidence of a positive interpretation bias was found in the non-dysphoric group. Consistent with previous research, older non-dysphoric participants provided more positive ratings for happy images compared to younger non-dysphoric participants. Although overall results are not consistent with previous research, methodological issues in the present study may go some way to explain these inconsistencies. Limitations in using eye tracking techniques on older adults offer one possible explanation. Further, the sub-clinical level of dysphoria in the present sample suggests that negative biases are most evident at severe, clinical levels of depression.

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GLOSSARY OF TERMS

Dysphoric and non-dysphoric

The terms 'dysphoric' and 'non-dysphoric', when applied to this study's participants, are used as categorical identifiers only. These terms in no way suggest that participants met criteria for clinical depression. These terms merely reflect the groups of participants whose CES-D scores were either above or below the cut-off score at the time of testing.

Younger adults and older adults

These terms are applied for categorical simplicity. Typically, the term 'younger adults' refers to adults who are of working age, while 'older adults' refers to those of retirement age. When used in discussion of the present study's participants, 'younger adults' refers to those participants aged between 19 and 39 years, while 'older adults' refers to those participants aged between 69 and 80 years.

Late-life depression and late-onset depression

Late-onset depression refers to the experience of depression with onset of symptoms occurring for the first time in late life (usually quantified as 60 years or older). This is distinctly different from late-life depression, which refers to the experience of depression by those aged 60 years or older, irrespective of previous depressive episodes that may have occurred in earlier adulthood, adolescence, or childhood.

Eye tracking

The term eye tracking is used in the current study to refer to use of an eye-gaze system to track how long and how often participants spent looking at images presented on a computer screen rather than to track eye movements or ascertain time spent inspecting individual elements within the images.

Sad images

The term 'sad' in relation to the experimental images is an umbrella term deemed to best engender a sense of sadness in the viewer, or the perception that the depicted scene displays sadness, sorrow, or mourning. These images could also be described as

'negative' in nature, though not in a fear-provoking manner (which would be the case for the threatening images).

Happy images

'Happy' images consist of those images considered to elicit a sense of joy, pleasure, or happiness in the viewer, or images that depict scenes of laughter, pleasant social interactions, and optimism. These images could also be described as 'positive' in nature.

Threatening images

'Threatening' images portray scenes that evoke a sense of threat or fear in the viewer, or that can typically be described as violent, aggressive, or frightening.

Neutral images

'Neutral' images are images considered to evoke little emotional response from the viewer, or images that depict items of little emotional regard.

ACRONYMS

AIM	Affect Infusion Model
ANOVA	Analysis of Variance
BDI	Beck's Depression Inventory
CES-D	Centre for Epidemiologic Studies Depression Scale
DAH	Differential Activation Hypothesis
DASS-21	Depression Anxiety and Stress Scale – Short Form
DOAT	Deployment-of-attention Task
DSM-5	Diagnostic and Statistical Manual of Mental Disorders 5th Edition
HADS	Hospital Anxiety and Depression Scale
MoCA	Montreal Cognitive Assessment
SPSS	Statistical Package for the Social Sciences
SST	Socioemotional Selectivity Theory

PREFACE

Depression, aging, and eye tracking! One could ask why, or even how, this became a topic of interest. In reality, the coming of age of this topic was somewhat serendipitous. It started with a conversation between myself and Associate Professor John Podd, with whom I had previously worked (although on completely unrelated topics). I can't recall the exact nature of the conversation other than there was some mention of the School of Psychology's recent acquisition of an eye tracking device, which John was keen to put to good use. As John has a keen interest in research pertaining to older adults and the effects of aging, and I had developed a curiosity in psychogeriatrics from an undergraduate paper I had completed a few years earlier, it seemed pertinent to include aging in our investigation. But aging, eye tracking, and what? A few psychological conditions were considered and quickly dismissed for logistical and ethical reasons. The idea of depression was raised, for which John was none too keen! He was already researching older adults and depression, and finding the recruitment of older depressed adults to be a difficult task. But I persevered and (extremely naively) put to John that I would be able to do the impossible and recruit the required number of clinically depressed participants. It is at this point that I can say, he was right; I was wrong. But I cannot state that I regret not listening. While I may not have recruited the necessary depressed participants, I believe I learned a great deal about depression and aging, which I will firmly carry with me into my clinical practice. But there was another reason for which I was so insistent about investigating depression in older adults. A very personal reason…

I have some very good friends whose father sadly committed suicide in late life. It was an event that left them, among other things, with a number of unanswered questions and an incessant need to understand why he did what he did. This is often the case with suicide – it simply does not make sense to those left behind. I remember a conversation I had whereby my friend said, "I just want to know why he did it". I had no answer; I did not know. I could not provide my friend with some, albeit momentary, reprieve from his pain. Suicide is a permanent solution to a temporary problem. It is difficult to understand for those of us who have no inkling to engage in this kind of behaviour, who see the future looking that much brighter. But I wanted to

understand it better for myself so I could help people, like my friend, understand it too, even if this understanding was ever so slight.

It would seem sensible that suicide should then become the focus of any future research. But to me, researching suicide was a bit like putting an ambulance at the bottom of the cliff. If I wanted to understand why people suicided, I needed to understand the risk factors associated with suicide, none so great as depression. And that is what I did - depression, aging, and eye tracking. It took some twists and turns, but what follows is the product of several years work trying to understand the differences in how older and younger adults may experience depression. Of course, I do not think for a minute that this research holds the key to why people suicide. Nor does it help me respond to my friend's desire to understand his father's death any better. But, what I do know is researching depression has taught me that there are distinct differences in the way older and younger adults present with depression. The current ways of responding to these differences by medical and mental health practitioners may not be identifying the true extent of depression in this older cohort, which means many are going either undiagnosed or misdiagnosed. And with that, I truly believe that every piece of research conducted in the area of aging and depression adds value to our knowledge base, aiding us to understand, interpret, assess, diagnose, and treat depression in older adults in a manner that is beneficial to this cohort, and ultimately reducing the number of future suicides.

Remaining lost are the words I needed to find to help my friend understand his father's death. But gained is the knowledge I now have that will aid me in helping others not reach such depths of depression as to find a similar fate. I still don't know why people suicide, but I do have a greater understanding of what they experience leading up to that point. It is here that the ambulance is firmly planted at the top of the cliff, in a proactive position, where it needs to be. And in understanding what those experiences of depression are like, it is through the experiential looking glass of Andrew Solomon, reflecting on a tree in a forest that had become encapsulated by vine, that others may come to see the desperation, despair, and unrelenting torment experienced in clinical depression:

> *My depression had grown on me as that vine had conquered the oak; it had been a sucking thing that had wrapped itself around me, ugly and more alive than I. It had had*

a life of its own that bit by bit asphyxiated all of my life out of me. At the worst stage of major depression, I had moods that I knew were not my moods: they belonged to the depression, as surely as the leaves on that tree's high branches belonged to the vine. When I tried to think clearly about this, I felt that my mind was immured, that it couldn't expand in any direction. I knew that the sun was rising and setting, but little of its light reached me. I felt myself sagging under what was much stronger than I…Its tendrils threatened to pulverize my mind and my courage and my stomach, and crack my bones and desiccate my body. It went on glutting itself on me when there seemed nothing left to feed it.

I was not strong enough to stop breathing. I knew then that I could never kill this vine of depression, and so all I wanted was for it to let me die. But it had taken from me the energy I would have needed to kill myself, and it would not kill me. If my trunk was rotting, this thing that fed on it was now too strong to let it fall; it had become an alternative support to what it had destroyed. In the tightest corner of my bed, split and racked by this thing no one else seemed to be able to see, I prayed to a God I had never entirely believed in, and I asked for deliverance…the very worst pain is the arid pain of total violation that comes after the tears are all used up, the pain that stops up every space through which you once metered the world, or the world, you. This is the presence of major depression (2001, pp. 18-19).