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Who owns these objects? - Impact of social and personal conditions on self-prioritisation

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Abstract

A relatively new development concerning literature pertaining to the concept of self-bias has highlighted that humans tend to self-prioritise when completing tasks based on perceptual judgements (the self-prioritisation effect). Since then, further exploration into the role that other tasks can have on this effect have been demonstrated, including the idea that object-ownership tasks show the same effects (Golubickis et al., 2018). As recent focus has been on the association between this effect and the task used, it means that there has been little exploration into the possible role that other variables have on predicting levels of self-prioritisation. Based on this, the current study aimed to investigate the influence of social/ personal conditions on self-prioritisation. An object-ownership task was used as a measure to compare levels of self-prioritisation against questionnaire scores assessing the current levels of four self-relevant conditions: self-monitoring, narcissism, anxiety, and depression. Linear regression analysis found that, out of all the conditions, only self-monitoring was able to significantly predict levels of self-prioritisation. These results suggest that certain traits can have an influence on the self-prioritisation effect, but the traits that do have an influence are more complicated to predict than just being self-relevant in nature.

Keywords: Self-prioritisation effect, friend-prioritisation effect, object categorisation task, depression, anxiety, narcissism, self-monitoring, self-bias, perceptual judgements.

Introduction

The concept of self is relevant to every one of us, from social to cognitive aspects and every element in between. Despite the perception that we are a selfless species, evolutionists have suggested otherwise. Dawkins (1976) states that the fundamental organisms which make up a person have the sole focus of replication, and this egocentric pursuit for survival equips every human with 'selfish genes' which are projected consciously and unconsciously throughout a person's life. Evolutionary theorists also believe that we have an instinct for putting ourselves first due to natural selection, implying that any instances of cooperation are fundamentally selfish (Heylighen, 2009).

Philosophers have been equally as interested in developing theories surrounding this topic. William James (1890) cultivated the *Theory of Self* which divides identity into two subsections; 'Me', broken down into various self-related aspects, and 'I' which forms the link between the subtypes of 'Me'. Together, these features form one complete entity of the self (James, 1890). Within the 'Me' component mentioned above, 'material me' emphasises the importance of a person's belongings in relation to their identity- a concept that has been inspirational in the development of research into the psychology of self.

The idea that individuals can process stimuli relevant to themselves has been coined as *self-referential processing*- a notion which has revolutionised experimental research into this field, including one experiment which found that self-encoded items lead to better memory recollection (Rogers, Kuiper & Kirker, 1977). In addition to this, advancements in technology have allowed psychologists to develop neurological models, such as the self-attention model (Yang et al., 2019), in which relevant experiments have localised self-referential processing to the medial prefrontal cortex- an area of the brain responsible for goal-directed behaviours (D'Argembeau et al., 2007). The relationship between the function of the medial prefrontal cortex and self-processing is in accordance with the evolutionary theories mentioned above, by inferring a link between selfishness and survival-performance. As well as the technological progressions in research, the floodgates have also been opened into the methodological progressions of self-referential studies, with more recent hypotheses exploring the possible influential factors of self-prioritisation.

Whilst exploring the effects of visual associations on self-relevant recognition tasks, Sui, He & Humphrey's (2012) developed an experimental test in which participants were shown a series of shapes with corresponding labels including 'self' and 'best friend'. In the test phase they were presented with a series of labelled shapes and were asked whether they believed that the information correctly matched that of the study phase or not. These results led to the coining of the *self-prioritisation effect* (SPE)- the notion that humans show a preference for the self when making judgements on the real or novel ownership of objects. This experiment has since facilitated a range studies in this field and inspired further exploration into this area. The 'ownership categorisation task' (Golubickis et al., 2018) is one variation of the original experiment, and involves giving participants novel ownership of one object, and someone else the ownership of another. The test phase differs from Sui et al., (2012) as participants are required to accurately identify the ownership of the object presented to them, as opposed to deciphering the predetermined information presented about an object. This version of the task enables researchers to look at

the self in a more representative way, as ownership has been suggested to be an extension of the self (Beggan, 1992). Other findings have shown that the SPE is not limited to visual stimuli, as audition and touch are also sensitive to its effects (Schäfer et al., 2016). As for demographics, Western cultures have higher accuracy for self-owned objects compared to collectivist cultures (Sparks et al., 2016), and statistically significant levels of self-bias can be seen from as early as 6 years old (Maire et al., 2020).

As shown above, it is clear that there is variation between self and other-prioritisation. The rationale for this study emerges as there is no explanation for the already established SPE. It remains unclear what the underlying factors are that can contribute to the differences in levels of self-prioritisation. There are a range of social and personal conditions which, by definition, could have an impact on our levels of self-bias.

Self-Monitoring:

Snyder (1974) proposed a theory distinguishing two types of self-monitoring personalities, the first being high self-monitors who are heavily influenced by social cues and how they are perceived. High levels of self-monitoring are more common in young people as they tend to be particularly sensitive to the perceptions that others have of them (Reifman, Klein & Murphy, 1989). In addition to this, the most prevailing age group among university students as of 2017/18 is twenty years old and younger (HESA, 2021). Based on this, it can be assumed that there will be high levels of self-monitoring among this demographic, and if this is the case, then the data from these participants would be insightful with regards to the effects that self-monitoring has on the SPE.

Conversely, low self-monitors are more reliant on their own attitudes and are therefore less susceptible to external influences. In accordance with this classification, it would be reasonable to predict that low self-monitors would show a high preference for 'self' in the ownership categorisation task due to their heightened self-concepts. However, the present self has been shown to have the most effect on self-prioritisation (Golubickis et al, 2017). In addition to this, low self-monitors rely on existing information around them when in any given situation (Fiske & Von Hendy, 1992). Combining both pieces of data, it makes the effects of low self-monitoring rates more complicated to predict as it suggests that levels of both self-prioritisation AND self-monitoring can be subject to change depending on the environment at the time of study.

The orbitofrontal cortex, located within the prefrontal cortex, plays an important role in the processing of self-monitoring behaviours (Beer et al., 2006). The fact that self-monitoring and self-referential processing have been shown to activate two areas of the brain which are interconnected suggests that there might be a link between the two processes, but research is required to examine the role of self-prioritisation specifically on this trait.

Narcissism:

Narcissism tends to be associated with negative connotations due to the lack of consideration that narcissists have for other people's points of view, but the different

subtypes of narcissism are useful to consider when looking at the effect that this trait can have on self-relevant behaviour. Whilst the 'vulnerable narcissist' is defined by characteristics including shyness and over-sensitivity compared to the extroverted and arrogant 'grandiose narcissist', both are very self-focused (American Psychiatric Association, 2013). Based off this information alone, it would be expected that levels of narcissism would strongly and positively correlate with self-prioritisation. Unsurprisingly, evidence from neurological studies also support the predictions made above, as the medial prefrontal cortex is linked with narcissistic traits (Nenadic et al., 2015). However, a lot of the research into this topic involves participants with extreme levels of narcissism, including narcissistic personality disorder. This is advantageous for psychologists as it demonstrates the effect of the experimental group on the control group by creating a large distinction, in this case, between narcissists and normal-functioning brained participants. Subsequently, these studies fail to consider the more subtle levels of narcissism which are common in the general population, therefore it would be irrational to generalise the results of extreme narcissistic participants to others with less profound characteristics.

A typical trait amongst narcissistic people is the perception that they are superior to others (Emmons, 1987), therefore implying that they put themselves first in social situations. This is important to consider because the SPE is based around a person's level of selfishness, and with both these factors together, it is logical to infer that there will be a strong correlation between the two. Taking all these aspects into account, it favours the idea that narcissism is a condition that is likely to impact self-prioritisation and therefore it would be beneficial to investigate.

Anxiety:

Even though there are many types of anxiety disorders, the diagnosis is always somewhat categorised by the unrealistic ways in which a person interprets their situation, such as excessive worrying (American Psychiatric Association, 2013). The focus on the self for those with anxiety has made it an important factor to consider when looking at the related aspects of psychology mentioned above, such as self-referential processing.

Generalised anxiety disorder (GAD) is one of the most common types, with estimated worldwide rates of between 1.6%-5% (Spitzer, Kroenke, Williams & Löwe, 2006). Aside from its high prevalence, it is also an interesting disorder to consider in relation to the SPE. Self-prioritisation can be measured by the reaction time/accuracy of the ownership for self-related items compared to those owned by someone else (Golubickis et al., 2018), and one of the main symptoms of GAD is overthinking situations and events, such as speaking to strangers (American Psychiatric Association, 2013). One explanation for excessive social-related thoughts of others is that those with anxiety fear how they may be perceived. Using this logic, it could be argued that anxious people are very self-bias in their thinking, with clinical reviews supporting this idea (Spurr & Stopa, 2002). Having said this, the excessive thoughts of other's perspectives could also suggest that when taking part in the ownership categorisation task, those with GAD may have less focus on the self-related ownership of objects, and therefore show more of a prioritisation for others. Taking both arguments into consideration, it begs the question of how those with symptoms of anxiety would perform in a self-prioritisation related task.

Depression:

Over the last decade, depression has been the most predominant mental health problem in the world (Vos et al., 2015). More specifically, a 2012 systematic review of depression rates amongst university students found that the prevalence of depression was substantially higher for students in comparison to the general population (Ibrahim, Kelly, Adams, & Glazebrook, 2013). Statistics like these show the significance of this mental health condition among people today which, in turn, highlights why any research into depression would be valuable.

The symptoms and severity of this condition range from person to person, and due to its high prevalence, many have conducted research in order to gain a better understanding of depression. One experiment focused on the relationship between self-referential processing and this condition and found that negatively biased self-referential processing increased a person's chances of having a depressive episode for the next three years (LeMoult et al., 2017). Research like this has been insightful in providing us with a more in-depth awareness of the risk factors associated with depression, subsequently helping with the prevention and early intervention of this condition- this is evident as the use of interventions have been successful in reducing the rates of depression by 20-25% (Reynolds et al., 2012). In addition to this, the cortical midline, which includes the previously established medial prefrontal cortex, has been used as a predictor for depressive vulnerability in those with no previous symptoms of the condition (Liu et al., 2020).

All this data indicates that there is a link between self-bias and depression, but a gap in the literature arises from the lack of research into the outcomes that depressive symptoms have on self-prioritisation rates. Based on what we know about this condition from the evidence above, it is difficult to predict whether depression would lead to an increase or decrease in self prioritisation, however it is logical to infer that there will be some relationship between the two due to the large role that the self plays in characterising depression.

Inspired by the gaps in the literature which have been highlighted above, the current study aimed to investigate the impact of social and personal conditions on self-prioritisation using the object categorisation task outlined above with pens and pencils as the object stimulus. Performance on task was regressed against questionnaire scales for depression, anxiety, narcissism, and self-monitoring.

Methodology

Participants and design:

The experiment involved 158 participants (19 males & 1 other, mean age = 20.80, SD = 4.44) and used a repeated measures design. Participants were recruited using an online opportunistic sample on the University of Plymouth's participation pool and with the reward of course credit for completing the study. The established criteria ensured that everyone who took part was an undergraduate Psychology student studying at any stage of university. All participants reported normal or corrected-to-normal visual acuity.

Stimulus, materials, and procedure:

Those interested in the study were required to sign up through SONA Systems. Completion of the experiment was not restricted to a particular environment, but a

computer or laptop was necessary for participation. After consenting, they were presented with a sequence of information, firstly explaining that they would be taking part in an object-categorization task featuring two types of objects (pencils and pens) and then they would be asked to fill in some short questionnaires.

Before beginning the task, it was then stated that the computer had randomly assigned one of the object categories to them (i.e., owned-by-self) and the other category had been allocated to a friend (i.e., owned-by-friend). This meant that the participant owned all the objects in their given category (either pens or pencils) and the friend owned all of the items in the remaining category. After pressing the spacebar on the keyboard, more on-screen text revealed who had been assigned the pens and pencils, respectively (i.e., you = pen, friend = pencil). Object assignment to self and friend were counterbalanced across sample.

After this, it was explained on the computer screen that the participants would be presented with one object at a time which would depict either pens or pencils and all they needed to do was indicate (as fast and accurately as they can) whether the item belonged to themselves or a friend using specified buttons on the computer/ laptop keyboard. They were instructed to press either the C or M key, with 'mine' and 'friend' labelling the corresponding responses- these key responses were also counterbalanced. Every trial commenced with a fixation cross in the centre of the screen for 1000ms, followed by a 100ms presentation of the image of either a pen or pencil and then a black screen until a button was pressed by the participant indicating whether they believed the object was owned by them or the friend. This cycle was repeated 20 times for the practice trials, followed by two blocks of 120 trials (totalling 240) with an equal number of self-owned and friend-owned trials in a randomised order. The pictorial stimuli were taken from Google images and edited on Photoshop CS6 to ensure that all of the images had the same luminance and orientation (every pen/ pencil was positioned from the bottom-left to the top-right corner). There were 20 different objects in total, of which 10 were pens and 10 were pencils and all sized at 140 x 140 pixels in greyscale. All stimuli were shown in equal amounts during the trials.

After the completion of the object-categorisation task, participants were introduced to the four questionnaires, one after another, which each consisted of a different number of items (57 items in total). The questionnaires were presented in a randomised order for each participant. 1. Patient Health Questionnaire (PHQ-9) measured the frequency of depressive symptoms using a four-point Likert scale ranging from 'Not at all' to 'Nearly every day' with nine items in total (Kroenke et al., 2001). 2. General Anxiety Disorder (GAD-7) measured the participant's level of anxiety for the two weeks prior to them completing the study and used the same four-point Likert scale as above but with seven items (Spitzer et al., 2006). 3.

Narcissistic Personality Inventory (NPI-16) measured their levels of narcissism by presenting them with two opposing statements in which they had to choose which was more suited to them, i.e., 'being an authority does not mean that much to me' and 'people always seem to recognise my authority' (Ames et al, 2006)
4. Self-monitoring scale measured the distinction between the self-presentation of the participants' and behaviours in external situations using 25 true or false items (Snyder, 1979).

After the task was completed, participants were presented with the experiment debrief and were thanked for their time.

Results

Before analysis, any extreme scores, including responses faster than 200ms; participants who completed >70% of trials; no responses; and those who participated at chance were excluded (>1% of trials omitted)

Paired sample T-test (one tailed) of accuracy in the object categorisation task:

To investigate the effects of self and friend-owned objects, the accuracy (proportion of correct responses) for each participant was submitted to a paired sample t-test. Findings show that mean accuracy was higher for the self-owned ($M = .90$, $SD = .08$) than friend-owned objects ($M = .87$, $SD = .11$) and a significant difference was found ($t(115) = -2.44$, $p = .008$). The increased mean accuracy for self-owned objects, as depicted in Figure 1, replicates previous research into the SPE, further supporting the idea that humans tend to self-prioritise when making judgements on the ownership of objects.

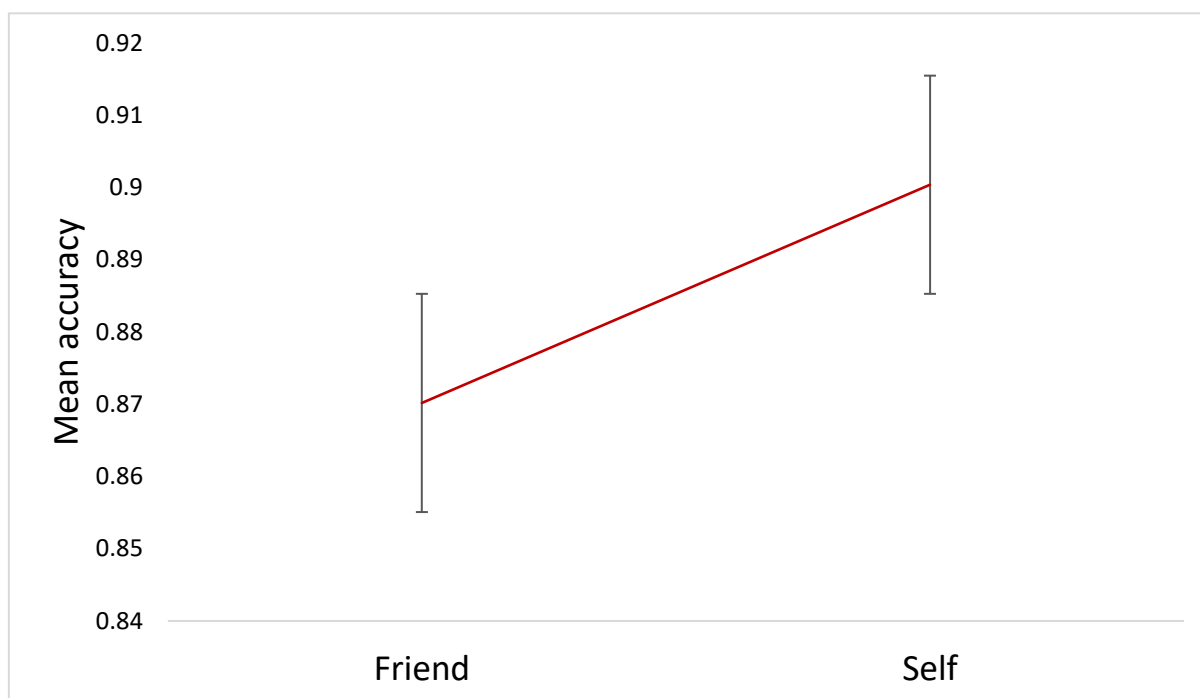


Figure 1: Line graph depicting the differences in mean accuracy between friend-owned and self-owned objects with standard error bars ($n = 116$).

Paired sample T-test (one tailed) of reaction time (RT) in the object categorisation task:

The same paired sample t-test was conducted on the participant's RT, and this also revealed a prioritisation for self, as responses to friend owned objects ($M = 543$ ms,

SD = 94ms) were slower than self-owned (M = 527ms, SD = 83ms), ($t(115) = 3.42, p < .001$). As displayed in Figure 2, participants responded quicker to self-owned objects on average, and this demonstrates a bias for the self which, similarly to the accuracy results, replicate findings that support the SPE in relation to object categorisation tasks.

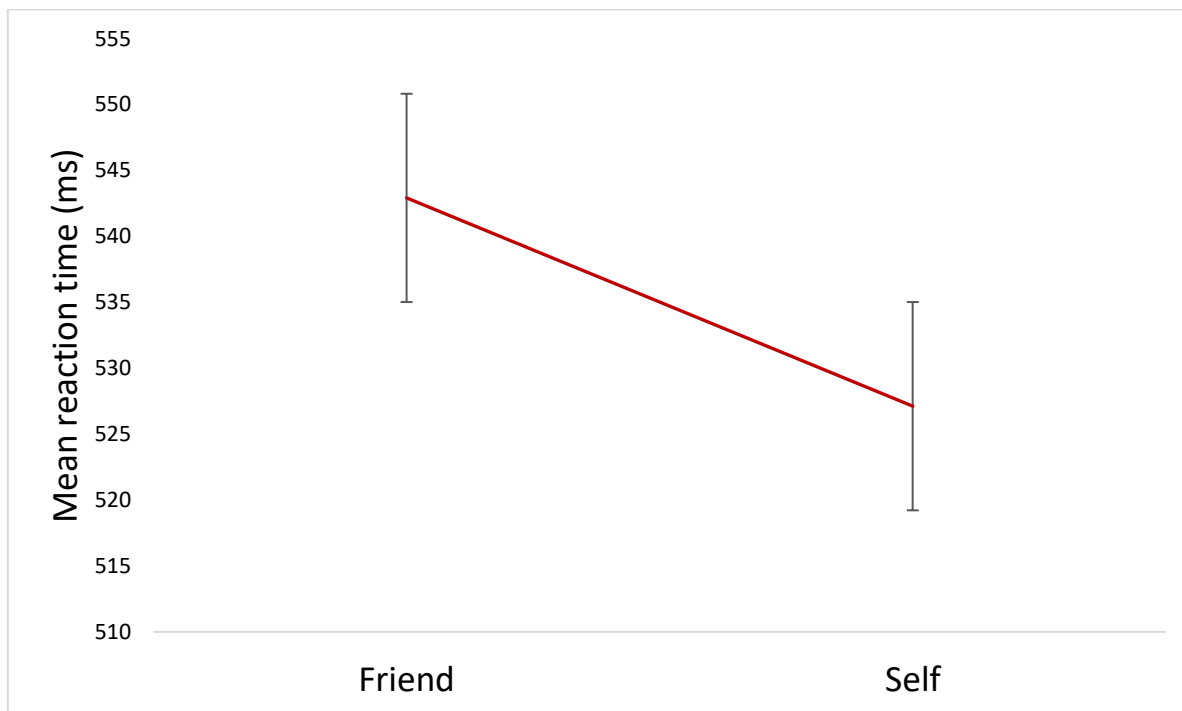


Figure 2: Line graph depicting differences in mean reaction time between friend-owned and self-owned objects with standard error bars (n= 116).

Pearson’s correlation (two-tailed) showing the relationship between scores of depression, anxiety, narcissism, and self-monitoring:

A Pearson’s correlation was carried out to investigate the relationship between the questionnaire scores for each of the four predictor variables: anxiety, generalised anxiety disorder (GAD-7); self-monitoring, self-monitoring scale (SMS); depression, patient health questionnaire (PHQ-9); narcissism, narcissistic personality inventory (NPI-16).

The data output shown in Table 1 denotes a strong positive correlation between GAD-7 and PHQ-9 scores at the $<.001$ level. GAD-7 also has a strong correlation with NPI-16 scores; however, this is a negative association and at the $.022$ level. Despite the significant correlations between the variables mentioned above, there appears to be no statistically significant association between PHQ-9 and NPI-16. The final noteworthy relationship is the positive correlation between SMS and NPI-16 scores, at a $.001$ level.

Table 1: Results of Pearson’s correlation on each predictor variable (n= 115)

Variable		GAD_score	totalSMS	PHQ_score	NPI_score
1. GAD_score	Pearson's r	—			
	p-value	—			
2. totalSMS	Pearson's r	0.018	—		
	p-value	0.847	—		
3. PHQ_score	Pearson's r	0.716	0.079	—	
	p-value	< .001	0.401	—	
4. NPI_score	Pearson's r	-0.213	0.299	-0.124	—
	p-value	0.022	0.001	0.186	—

Linear regression analysis of SPE scores on depression, anxiety, narcissism, and self-monitoring levels:

A linear regression was carried out to investigate whether social/ personal conditions were able to predict self-prioritisation- each SPE score was calculated by subtracting the participant’s friend-response from their self-response (any SPE score below zero is indicative of a friend-prioritisation effect).

Results from the analysis showed that out of the four predictor variables, self-monitoring was the only condition able to significantly predict levels of self-prioritisation (B = 2.62, SE = 1.30, t = 2.02, p <0.05). Figure 3 demonstrates a positive correlation between the two variables, therefore indicating that as levels of self-monitoring increase, so do the rates of self-prioritisation.

Aside from this, none of the other conditions were able to predict the SPE. Of the other traits, narcissism came the closest to being significant (t = -1.18, p = .24), anxiety did not significantly predict SPE (t = 0.36, p = .72) and neither did depression (t = -0.63, p = .53). These statistics partially contradict the hypothesis that the SPE can be affected by self-related social/ personal conditions as most variables did not predict self-prioritisation.



Figure 3: Partial regression plot showing relationship between self-prioritisation effect scores and levels of self-monitoring (n= 115). Generated using statistical package JASP (JASP Team, 2020).

Discussion

In an attempt to expand upon the existing literature surrounding the self-prioritisation effect (SPE), the current study used an object categorisation task to investigate which social and/ or personal conditions, if any, would influence the SPE. Findings revealed that when making judgements on the ownership of objects, participants showed a significant SPE for both the accuracy and reaction time of their responses.

These findings replicate that of previous studies (Golubickis et al., 2018; Schäfer & Frings, 2019), therefore increasing the validity of the SPE as a concept. In addition to this, when the participant's SPE score was regressed against the four trait questionnaire results, it was established that self-monitoring positively predicted a person's level of self-prioritisation. However, contrary to the experimental hypothesis, narcissism, anxiety, and depression had no significant effect on levels of self-prioritisation despite previously explored evidence which would indicate otherwise. This raises the question of why only one of the variables was able to support our experimental hypothesis.

Self-monitoring:

As previously established, the regression analysis demonstrated that self-monitoring could predict a person's SPE score. The regression plot, previously depicted by Figure 3, demonstrated a significant positive correlation between the two, meaning

that higher levels of self-monitoring are associated with higher SPE scores. Despite these results, Snyder (1974) proposed that low self-monitors are reliant on their own attitudes, and the self-focused nature of this characteristic should reflect in our findings by showing a high SPE among this group, however the opposite relationship was found from our data. One explanation for the discrepancy in results could be the essence of the task. Snyder's self-monitoring categories were centred around people's attitudes and intentions, as opposed to concrete behaviours like the object-categorisation task. Bearing this in mind with relation to our results, it suggests that the ways in which characteristics associated with low self-monitors are expressed is subject to the nature of the task. Taking this into account, the current findings are influential as they demonstrate the specific impact that self-monitoring has on materialistic-based self-prioritisation.

It is also important to note that some of the low self-monitoring participants showed a friend-prioritisation effect (FPE). This is significant as it highlights the complexity of predicting self-prioritisation with regards to this trait by demonstrating a link between the social implications of self-monitoring and the impact that these consequences have on self-prioritisation. Having said this, the present study fails to ascertain an explanation for differences between the low self-monitors who showed a FPE compared to those with a SPE, therefore further research would be beneficial to better understand how to predict the types of prioritisation on self-monitoring. On the other hand, one aspect of the findings which was successfully predicted by the literature with regards to self-monitoring was the distribution of scores. As mentioned previously in the paper, young people are sensitive to high levels of self-monitoring (Reifman et al., 1989). This concept was demonstrated in the current study as the average participant age was young ($M = 20.80$, $SD = 4.44$) and the self-monitoring questionnaire had the highest mean score out of all conditions ($M = 12.65$, $SD = 0.83$). This indicates that we can reliably predict levels of self-monitoring based on a person's age, and the implications of this concept on future research will be discussed in due course.

Narcissism:

When evaluating the findings of each condition based on existing literature, the most surprising conclusions emerge from the narcissism variable. The regression analysis measuring the prediction of this trait on levels of self-prioritisation was not statistically significant. This finding equips researchers with a more specific understanding the SPE's susceptibility to social/ personal conditions by demonstrating that being self-relevant does not necessarily mean that a trait is predictive of self-prioritisation. These results, in conjunction with the self-monitoring findings mentioned above, show that some personality traits are indicative of the SPE, however it also suggests that the variables needed to predict this effect are more meticulous than hypothesised, so additional research is needed to explore this idea in more detail.

Even though these results suggest that narcissism has no influence on the SPE, it is important to note that these findings are contradictory to the neurological and social cognition research previously explored in this paper (American Psychiatric Association, 2013; Emmons, 1987). One explanation for this inconsistency is the lack of distribution between participants' scores in the Narcissistic Personality Inventory questionnaire (NPI-16). The mean NPI-16 score is low ($M = 2.63$, $SD =$

1.31), which indicates that most of the participants had low levels of narcissism at the time of the study and therefore the data does not account for high levels of the trait. The implications that this could have on the overall results coincide with the literature referred to above, as the afore mentioned studies used participants with very high levels of narcissism- this could explain why our results were not significant but theirs were.

Anxiety:

The methodological flaws within the current study could account for the surprising findings of the anxiety condition. One limitation of this study is the lack of ecological validity, as the experiment was conducted using a computer, therefore the participants had to imagine the 'friend' as opposed to having a friend present. This has implications on the data in the anxiety condition because the task fails to imitate the social consequences that anxiety can induce, such as avoidance of the feared stimuli (Pittig et al, 2014), ergo, it is hard to generalise said findings to real life settings. Whilst this limitation could explain why the findings in the anxiety condition were not significant, it could also be the case that clinical disorders are just not able to predict the SPE due to the well-known management techniques associated with their symptoms compared to the more stable presentation of personality traits.

Depression:

As per our research findings, there appears to be no relationship between the participant's depression scores and their levels of self-prioritisation. This disputes the predictions we made prior to the experiment that were influenced by existing research, including LeMoult et al., (2017) who established that self-referential processing levels were able to predict depressive episodes. The fact that these results do not correspond with the findings in the current study implies that, despite being similar by definition, self-referential processing and the SPE are independent concepts and do not overlap. This finding should be considered when inferring information from one concept to another.

Future research:

The innovative nature of the current findings has paved the way for future research. Using the knowledge that self-monitoring levels can predict the SPE, the next step should be to investigate if it is possible to accurately predict which characteristics of self-monitoring will lead to the exhibition of either a FPE or SPE- this will further develop our psychological understanding of the role that this trait has on self-prioritisation. The previously discussed idea that age can reliably induce levels of self-monitoring is another concept that could be utilized for further research. By using age as a variable to compare performance in the object categorisation task, it would provide a more concrete and in depth understanding of the extent to which this trait is able to predict the SPE.

Although neither of the narcissism, anxiety or depression results were significant, the afore mentioned limitations associated with them should be addressed in future research as a way of verifying their lack of influence on the SPE. For example, the prediction that inconsistencies between the literature on narcissism and the present findings are because of the limited ranges of narcissism levels within samples, and this is an aspect that would benefit from further investigation. By comparing the SPE scores of clinically diagnosed narcissists to participants with low levels of narcissism,

it would provide a more thorough insight into whether different levels of this trait have any effect on self-prioritisation.

Conclusions

In conclusion, these findings have been influential by demonstrating the first piece of empirical evidence that a condition associated with an individual's personality can reliably predict how much a person shows a SPE. Since self-monitoring can positively predict self-prioritisation, it suggests that other social/ personal conditions could be equally as influential in this regard. Having said this, not all the self-relevant conditions were significant, thus indicating that the necessary features needed to predict the SPE are more complicated to predict than previous research would suggest.

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