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RESEARCH PAPER

Why do materialistic values undermine flow experiences? The role of self-regulatory resources

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Abstract

Aims: Research has shown that the possession of materialistic values can lead individuals to be less likely to experience flow, an important component of well-being. In this research, we test whether a lack of self-regulatory resources, and a tendency to use self-regulatory resources for avoidance purposes, can mediate this relationship.

Methods: A representative sample of 2000 adults in the UK completed an online survey. Results were analysed using structural equation modelling.

Results: Materialistic values were related to a heightened tendency to dedicate self-regulatory resources towards the avoidance of negative states, which in turn was linked to lower levels of self-regulatory strength. Low levels of self-regulatory strength were related to a reduced tendency to experience flow.

Discussion: The findings provide new insights surrounding the factors and processes that hinder and enhance the creation of flow experiences. In doing so, they suggest suitable routes to promoting flow experiences in materialistic individuals, which in turn should improve their well-being.

Conclusions: Reducing the desire to avoid negative experiences could encourage flow experiences by enhancing self-regulatory resources. Future research is needed to test the causal nature of these relationships.

Keywords: *materialistic values, flow, self-regulation, experiential avoidance*

Flow describes a state of total immersion in an optimally challenging activity. It requires effort to achieve, as individuals must acquire the necessary skills to effectively engage with a challenging task and choose to dedicate all of their attention to it. Once in flow, individuals may experience a lack of boundaries between themselves and the action they are performing and temporarily lose awareness of time and their everyday worries. Flow experiences are intrinsically rewarding (Csikszentmihalyi, 1992). Flow experiences have long been considered as beneficial for wellbeing, having been linked to greater self-confidence (Hektner & Csikszentmihalyi, 1996), higher life satisfaction (Tse et al., 2020) and greater positive affect (Rogatko, 2009), amongst others.

Despite the beneficial nature of flow, emerging evidence is suggesting that individuals holding strong materialistic values are less able to have these experiences (Csikszentmihalyi, 2004). Individuals with strong materialistic values hold firm beliefs concerning the importance of acquiring material goods to achieve happiness and status (Richins & Dawson, 1992). Khanna

and Kasser (2001) demonstrated that highly materialistic students in the US and India felt more alienated (separated from own experience) during their work, leisure, and personal relationships, compared to their less materialistic counterparts. In addition, Isham et al. (2020) reported a negative correlation between materialistic values and flow proneness (each individual's general tendency to experience flow), and demonstrated that priming a materialistic mind-set led individuals to subsequently report poorer quality flow experiences during an activity (in comparison to a low materialism and neutral control group).

Difficulties in experiencing flow may have detrimental effects for the wellbeing of more materialistic individuals. Indeed, strong materialistic values have been negatively linked to many facets of personal wellbeing such as self-esteem, life satisfaction and positive affect (Dittmar et al., 2014). It is less clear why materialistic values should have flow-limiting effects. In this research we test several hypotheses concerning the potential mediating factors in this relationship. We focus on ideas relating to self-regulatory resources, considering how these are needed to facilitate flow experiences, yet may be lacking, or used less effectively, by individuals displaying stronger materialistic values.

SELF-REGULATORY STRENGTH

The strength model of self-regulation (Baumeister et al., 2007) proposes that an individual's ability to manage their thoughts, emotions, and behaviours such that they are in line with certain goals, norms, or expectations relies upon a resource that is limited in its capacity. Some individuals have more of this resource (higher levels of self-regulatory strength) and thus are better able to self-regulate. As the resource is not unlimited it also means that when we exert self-regulation in one domain this temporarily depletes our available resources for use on a wider variety of self-regulatory tasks (de Ridder et al., 2012).

DOES FLOW DEMAND HIGHER LEVELS OF SELF-REGULATORY STRENGTH THAN MATERIALISTIC INDIVIDUALS POSSESS?

The experience of flow is expected to require self-regulatory resources for several reasons. The first is to develop a sufficiently high level of skill. Flow is said to occur when an individual effectively interacts with a challenging activity above their average skill level. Kitsantas and Zimmerman (2002) found that combining 12 measures of self-regulation could explain 90% of the variance in serving skill when comparing college-level volleyball players to non-expert and novice players. Self-regulatory resources enable an individual to initiate practice, manage behavioural performance, and reflect on success or failures (Zimmerman, 2006). This should help them to improve their skill level. Kim et al. (2019) demonstrated that athletes who scored higher on a measure of self-regulated learning were more likely to experience flow during sports. Self-regulatory resources will also facilitate the regulation of emotions such that individuals are more likely to persist in the early stages of skill development when feelings of disappointment may be common (Hopwood et al., 2015).

Self-regulatory resources will also allow individuals to have good control over their attention, such that they can maintain focus and reduce interference from distracting stimuli. One of the key components of flow is that individuals are completely concentrated on the task at hand. Jackson (1992) found that national champion figure skaters believed that maintaining appropriate focus was one of the most important factors for them to experience flow. Further, Lee (2005) reported a significant negative relationship between academic procrastination (a form of self-regulatory failure, Steel, 2007) and the experience of flow when sampling Korean students. Kuhnle et al. (2012) also reported a positive correlation between levels of self-control and the experience of flow when studying German eighth graders.

While theoretically flow appears to place significant demands on self-regulatory resources, several behaviours linked to the possession of materialistic values have been explained in terms of a lack of self-regulatory strength. These include compulsive buying (Claes et al, 2010), overspending (Gardarsdottir & Dittmar, 2012), impulsiveness (Roberts & Pirog, 2013), and risky behaviours such as smoking and drug use (Dittmar et al., 2014). Further, Rose (2007) found that scores on the Material Values Scale (Richins, 2004) were negatively correlated with scores on a measure of impulse control. Therefore, highly materialistic individuals may possess levels of self-regulatory strength that are too low to facilitate flow experiences.

DO MATERIALISTIC INDIVIDUALS USE THEIR SELF-REGULATORY RESOURCES IN THE WAYS THAT ARE LESS SUPPORTIVE OF FLOW?

Additionally, flow experiences may be reliant on individuals choosing to use their self-regulatory resources in certain ways.

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Stenseng et al. (2012) found that individuals could either approach an activity viewing it as an opportunity for personal growth (self-expansion motivation) or as a means of avoiding thinking negatively about the self and current stressors (self-suppression motivation). Approaching leisure activities such as sports and arts with a self-suppression motive was associated with a reduced tendency to experience flow in these activities whilst approaching them with a self-expansion motive was linked to greater flow proneness. This idea was supported by Asakawa (2004) who found that Japanese college students who experienced flow more often were less likely to engage in maladaptive coping styles, often involving the avoidance of problems. Therefore, purposeful attempts to regulate the experience of negative emotions via avoidance may hinder the quality of flow experiences. This may be because flow is said to be an intrinsically motivating process (Csikszentmihalyi, 1992). That is, individuals engage with an activity for reasons of enjoyment only. If engagement in an activity is motivated by a desire to avoid negative thoughts or feelings, rather than enjoyment, then this may undermine the intrinsically motivating aspect of flow. Further, trying to avoid undesirables could also interrupt the process of creating flow by hindering peoples' skill development. Approaching learning activities with performance-avoidance goals, whereby the individual strives to avoid appearing incompetent, has been shown to lead to poorer learning outcomes (Ku et al., 2014).

A body of research has linked materialistic values to a tendency to use self-regulatory resources in ways similar to the avoidance strategies that have been implicated in hindering flow. Kashdan and Breen (2007) reported a positive relationship between materialistic values and experiential avoidance, which involves an unwillingness to be in contact with negative thoughts, feelings, or situations. Materialistic values have also been associated with a desire not to appear vulnerable in front of others (Christopher et al., 2005), a preference for avoidant coping strategies (e.g. denial, suppression) in response to a traumatic event (Somer & Ruvio, 2014), and a prevention regulatory focus (inclined to use self-regulatory resources to prevent failure; Lens et al., 2010). Further, Donnelly et al. (2016) proposed that materialism represents a coping strategy for escaping aversive self-awareness. Narrowing attention down onto only consumer goods prevents attention from drifting onto the self. Therefore, highly materialistic individuals may be inclined to use their self-regulatory resources towards the avoidance of undesirables, which is not supportive of flow experiences.

A COMBINATION OF SELF-REGULATORY STRENGTH AND TENDENCIES TO USE SELF-REGULATORY RESOURCES FOR AVOIDANCE?

Self-regulatory strength and the tendency to use self-regulatory resources for the avoidance of undesirables may also operate in a sequential manner to mediate the relationship between materialistic values and reduced flow proneness. According to the strength model of self-regulation, if self-regulatory resources have been used towards the avoidance of undesirables, then self-regulatory strength should be depleted and thus there are fewer resources available to use towards flow pursuits. In addition, a small field of research has suggested that individuals holding a prevention regulatory focus are less effective in their use of self-regulatory resources. For example, Dholakia et al. (2006) found that priming a prevention regulatory focus led individuals to display poorer self-control when given the opportunity to eat a slice of cheesecake whilst following a diet programme. Crowe and Higgins (1997) also demonstrated that prevention-focused individuals were quicker to quit following failure on a difficult task. Therefore, it may be that there is something more inherent within a prevention/avoidance mind-set that leads individuals to display lower self-regulatory strength.

OVERALL AIMS AND HYPOTHESES

This study aimed to test whether levels self-regulatory strength and the tendency to use self-regulatory resources towards the avoidance of negative thoughts, feelings and events can mediate the relationship between strong materialistic values and lower levels of flow proneness. The results have important implications not just for understanding the relationship between materialism and flow, but also perhaps in the promotion of flow experiences to more materialistic individuals, in order to have beneficial effects on their personal wellbeing. The three main hypotheses are as follows:

H1: Low levels of self-regulatory strength mediate the relationship between materialistic values and a lower likelihood of experiencing flow.

H2: A tendency to use self-regulatory resources towards the avoidance of undesirable thoughts, feelings and events mediates the relationship between materialistic values and a lower likelihood of experiencing flow.

H3: Self-regulatory strength and a tendency to use self-regulatory

resources towards the avoidance of undesirables work together to mediate the materialism-flow relationship: specifically, using self-regulatory resources to avoid undesirables is linked to lower levels of self-regulatory strength which reduces the tendency to experience flow.

METHOD

Participants and procedure

A nationally representative sample of 2000 adults in the United Kingdom was recruited via an external market research company. Quotas were implemented concerning age, gender, socioeconomic status, and geographical region using the latest available government census data. Post hoc power analyses (Soper, 2018) showed that based on the sample size of 2000, an alpha probability of .05, and an observed R^2 value of .09 (the smallest R^2 value for the flow proneness latent variable across our two models), we had enough power to detect any meaningful effects (power = 1.0). The questionnaire was completed online and the order of the individual questionnaires randomised. The study obtained ethical approval in line with the University's ethical guidelines and all participants provided informed consent prior to starting the survey.

Measures

Materialistic values

Material values scale. The Material Values Scale (Richins, 2004) contains 15 items assessing the degree to which acquiring material goods is viewed as a central goal (α = .55), as a route towards happiness (α = .71), and as a sign of success (α = .80). Each of these three subscales contains five items to which participants rate their agreement on a scale from 1 (*not at all*) to 7 (*very much*). Scores across the three subscales are averaged to give an overall materialistic values score (α = .83). Example items include "I like a lot of luxury in my life" (centrality subscale), "I'd be happier if I could afford to buy more things" (happiness subscale), and "I admire people who own expensive homes, cars, and clothes" (success subscale).

Aspiration index. The 14-item shortened version of Kasser and Ryan's (1996) Aspiration Index (Martos et al., 2006) assessed how important respondents deemed different life goals. Some of these goals are classified as extrinsic (e.g. "to be rich" and "to be famous") whilst others are intrinsic (e.g. "to help others improve their lives" and "to grow and learn new things"). Respondents rated how important each goals was to them on a scale of 1 (*not at all*) to 7 (*very*). The internal reliability of the extrinsic (α = .87) and intrinsic (α = .85) items was good. Materialism is considered as placing a greater emphasis on extrinsic relative to intrinsic goals.

Flow proneness

Participants' tendency to experience flow was measured using the English version of Ullén et al's. (2012) Swedish Flow Proneness Questionnaire. Individuals rated how often (1 = *never*, 5 = *almost every day*) they experienced seven feelings characteristic of flow during their work (α = .74), household chores (α = .72), and leisure time (α = .81). Example items include "you feel completely concentrated" and "you have a sense of complete control". This scale therefore allowed for an examination of the tendency to experience flow across a range of contexts, rather than just in one specific scenario. Whilst the original scale asks participants to skip the work section if they are unemployed, we allowed students to complete this section. Rather than answering how often they experienced the seven feelings during their work, students responded with how often they experienced them during study periods. Here, α = .89 for the full scale.

Self-regulatory strength

Trait levels of self-regulatory strength were measured using Tangney et al's. (2004) Brief Self-Control Scale. This 13-item measure assesses self-regulatory strength using items relating to controlling thoughts, controlling impulses, regulating behaviour, and breaking habits. Participants rate their agreement with items on a scale of 1 (*not like me at all*) to 5 (*very much like me*). Here, α = .81.

Avoidance of undesirables

An individual's tendency to use their self-regulatory resources to avoid negative feelings, thoughts, and events was examined using a combination of three scales. This was because the research suggesting links between materialism, avoidance of undesirables and flow experiences was drawn from a variety of literatures, rather than all findings linking to experiential avoidance, for example.

Prevention regulatory focus. The prevention subscale of The General Regulatory Focus Measure (Lockwood et al., 2002) was used to assess the extent to which individuals were motivated to prevent undesirable outcomes. Examples of items include "In

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general, I am focused on preventing negative events in my life", and "I am anxious that I will fall short of my responsibilities and obligations". The subscale has seven items which respondents rate how true they are of themselves on a scale of 1 (*not at all true of me*) to 9 (*very true of me*), α = .84.

Experiential avoidance. To measure experiential avoidance we employed both the Acceptance and Action Questionnaire–II (AAQ-II; Bond et al., 2011) and the Brief Experiential Avoidance Questionnaire (BEAQ; Gámez et al., 2014). The AAQ-II contains seven items such as "worries get in the way of my success" and "I'm afraid of my feelings", to which participants rate how true the statement is of them on a scale of 1 (*never true*) to 7 (*always true*), α = .95. The BEAQ contains items that assess an individual's tendency to view pain negatively and avoid painful situations, thoughts, and emotions. We chose to use this scale in addition to the AAC-II because it taps more specifically into people's desire to be rid of negative emotions rather than just the extent to which they are perceived to be causing problems in one's life. For example, through the inclusion of items such as "I would give up a lot to not feel bad" and "I work hard to keep out upsetting feelings". Respondents rate their agreement with the 15 items on a scale of 1 (*strongly disagree*) to 6 (*strongly agree*), α = .88.

RESULTS

Descriptive statistics

Table 1 displays the means, standard deviations, and correlations between all variables. Materialistic values were negatively correlated with flow proneness and self-regulatory strength but positively correlated with 'avoidance of undesirables' measures. Equally, flow proneness was positively correlated with self-regulatory strength and negatively correlated with most 'avoidance of undesirables' measures.

Plan of analysis

Structural equation modelling (SEM) with maximum likelihood using AMOS 23.0 (Arbuckle, 2014) was conducted. Variables were modelled as latent variables and indicated using three, four, or six observed indicators. Items were parcelled using a content-based (Landis et al., 2000) parcelling method. When there were a larger number of dimensions within a scale, or the indicators displayed low loadings onto the latent variable using this content-based method, the factorial algorithm method (Rogers & Schmitt, 2004) was instead employed. Model fit was examined using the root mean square error of approximation (RMSEA) and comparative fit index (CFI). This method followed (a) suggestions in the literature to use a combination of a relative fit index (e.g. CFI) and either the standardized root mean square residual (SRMR) or RMSEA in order to minimise Type I and Type II errors (Hu & Bentler, 1999), (b) findings that CFI and RMSEA indicators are least affected by sample size and estimation technique (Cangur & Ercan, 2015), and (c) previous research using similar constructs and methods (e.g. Unanue et al., 2014) also choosing to employ these indices. CFI values of above .90, and RMSEA values below .08 were considered as indicative of a good model fit (Awang, 2012). There was no missing data. All skewness and kurtosis values were between ± 2, indicating that the variables were normally distributed.

Confirmatory factor analysis of the measurement model

The initial four-factor measurement model displayed adequate fit, $\chi 2$ (84) = 1268.25, p < .001; CFI = .92; RMSEA = .08. Modification indices suggested that model fit could be improved by co-varying the error terms of the third Aspiration Index parcel with the other two remaining Aspiration Index parcels. This improved the model fit such that it was now good, $\chi 2$ (82) = 845.73, p < .001; CFI = .95; RMSEA = .07 (Steiger, 2007). All factor loadings were above the cut-off point of .5. All constructs demonstrated good convergent and discriminant validity, as indicated by composite reliability (CR) values above .7, average variance extracted (AVE) values above .5, and greater AVE than maximum shared variance (MSV) values for each construct (Hair et al., 2010).

Structural models

Two structural models were tested.The first included only the materialism latent variable as a predictor of flow proneness, to determine if we could we could replicate previous findings concerning the negative relationship between materialistic values and flow proneness. This model displayed good fit, $\chi 2$ (45) = 444.95, p < .001; CFI = .98; RMSEA = .06. Path coefficients demonstrated that materialism scores were negatively associated with flow proneness (standardized effect = -.22).

The second model included the three hypothesized mediating paths: through self-regulatory strength, through the avoidance of undesirables, and the sequential effect of both mediators. Note that, due to the cross-sectional nature of this study, we

Table 1

Means, Standard Deviations, and Correlations between All Items

		M	*SD*	1	1.1	1.2	1.3	2	3	3.1	3.2	3.3	4	5	6
1	Materialistic values	41.88	8.85												
1.1	Acquisition centrality	14.40	3.04	.76***											
1.2	Happiness dimension	14.03	3.75	.79***	.40***										
1.3	Success dimension	13.45	4.17	.86***	.52***	.49***									
2	Relative importance of extrinsic goals	-1.69	1.48	.64***	.39***	.46***	.65***								
3	Flow proneness	23.26	3.81	-.18***	-.15***	-.19***	-.10***	-.24***							
3.1	School or work	23.20	4.13	-.17***	-.15***	-.19***	-.08***	-.19***	.88***						
3.2	Household chores	22.79	4.20	-.14***	-.11***	-.15***	-.07**	-.18***	.89***	.68***					
3.3	Leisure time	23.79	4.53	-.17***	-.13***	-.18***	-.12***	-.26***	.90***	.69***	.69***				
4	Self-regulatory strength	41.12	8.13	-.31***	-.15***	-.34***	-.25***	-.26***	.28***	.30***	.23***	.23***			
5	Prevention RF	34.86	11.12	.36***	.10***	.36***	.37***	.28***	-.03	-.04	.01	-.04	-.41***		
6	Exp avoid (BEAQ)	52.31	12.07	.33***	.10***	.32***	.34***	.30***	-.13***	-.14***	-.09***	-.11***	-.39***	.57***	
7	Exp avoid (AAQ-II)	23.85	10.90	.35***	.09***	.40***	.32***	.32***	-.25***	-.26***	-.18***	-.23***	-.48***	.65***	.65***

Note. *** p <.001 ** p <.01 * p < .05

cannot test for any bi-directionality in the relationship between avoidance of undesirables and levels of self-regulatory strength. We chose to model the effect of avoidance of undesirables on self-regulatory strength as previous findings (e.g. Dholakia et al., 2006) had demonstrated that priming a prevention/avoidance mind-set could lead to lower levels of self-regulatory strength. However, there is also the possibility for this relationship to function in the opposite direction.

The mediational model (see Figure 1) displayed good fit $\chi 2$ (82) = 845.73, p < .001; CFI = .95; RMSEA = .07. The size of the direct effect from materialism to flow proneness was reduced in comparison to the first model, suggesting that partial mediation was likely. The standardized indirect effect between materialism and flow proneness was -.10. A bias-corrected bootstrap procedure (Efron, 1987) with 2000 samples and 95% confidence intervals demonstrated that this was significant at the p <.01 level, CI[-.14 to -.06]. The specific indirect effects were tested using a product of coefficients approach as outlined in Hayes et al. (2011). The indirect pathway through materialistic values » self-regulatory strength » flow proneness was significant (z = -3.72, p < .01, 95% CI[-.06 to -.02]), thus supporting Hypothesis 1. The indirect pathway through materialistic values » avoidance of undesirables » flow proneness was not significant (z = 1.33, p = .09, 95% CI[-.07 to .01]), hence Hypothesis 2 is not supported. The sequential mediating effect (materialistic values » avoidance of undesirables » self-regulatory strength » flow proneness) was significant (z = -7.48, p < .001, 95% CI[-.13 to -.08]), supporting Hypothesis 3.

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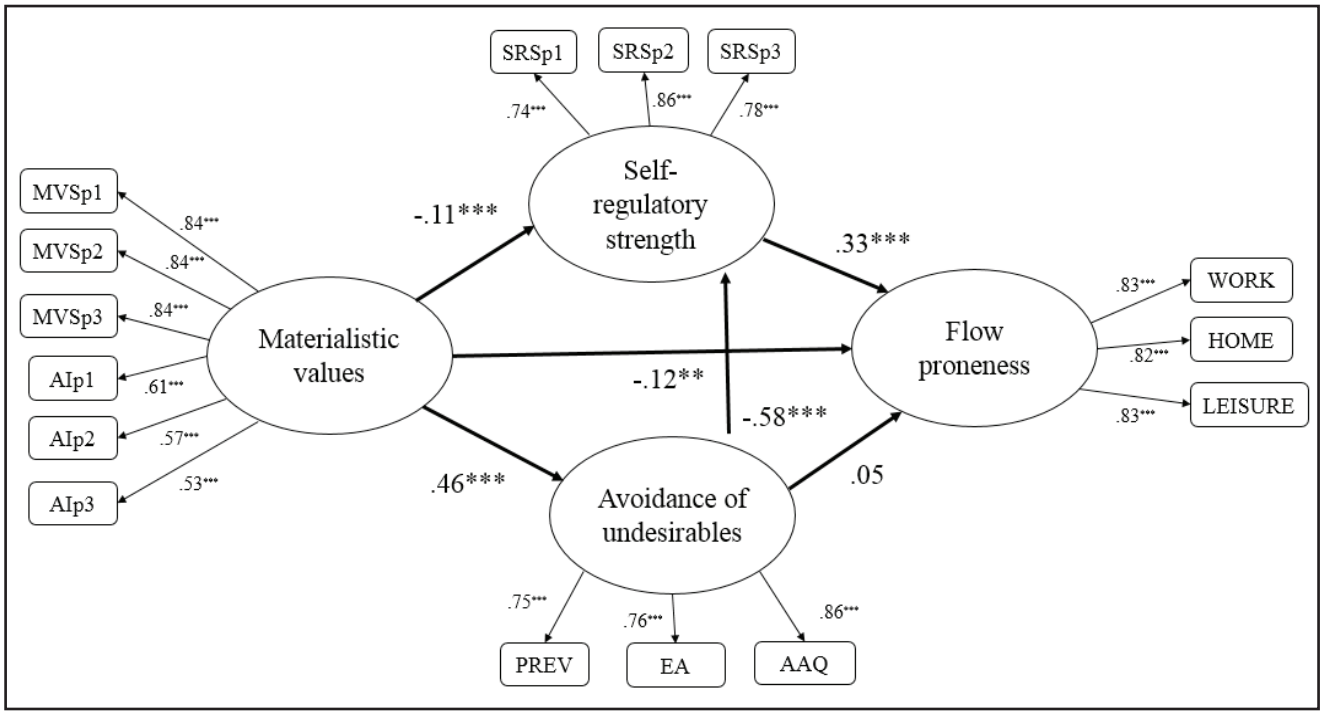
Figure 1

Structural Model Assessing the Three Hypothesized Mediating Effects through Self-regulatory Strength and Avoidance of Undesirables.



Note. Error terms not displayed for the sake of clarity. * $p < .05$ ** $p < .01$ *** $p < .001$

DISCUSSION

The aim of this study was to test several hypotheses concerning the role of self-regulatory resource levels and the way in which these resources are used in accounting for why individuals possessing strong materialistic values are less able to experience flow. We find that highly materialistic individuals tend to have lower levels of self-regulatory strength which in turns is linked to them being less prone to experiencing flow. Lower levels of self-regulatory resources appear to be a related to the tendency of highly materialistic individuals to grant their self-regulatory resources to tasks that involve avoiding undesirable feelings, thoughts and events. This study has therefore supported and added to the existing literature in several ways.

Firstly, we replicate previous findings concerning the negative relationship between the possession of materialistic values and the tendency to experience flow. In their previous study, Isham et al. (2020) used an opportunity sample of 451 individuals and found the overall correlation between materialistic values (as measured by the MVS) and flow proneness to be -.19 ($p < .001$), which is almost exactly the same as we find in the present study (r = -.18, $p < .001$) using a larger, representative sample. This helps to strengthen the evidence base and reliability of the negative association between materialism and flow proneness.

Previous research (Asakawa, 2004) had suggested that highly flow prone individuals were less likely to use avoidance coping strategies. In line with this, we found a negative correlation between our

experiential avoidance measures and flow proneness. However, the results from our structural model suggested that the avoidance of undesirables could not mediate the relationship between materialistic values and flow proneness on its own. Instead, it appears that the avoidance of undesirables may be indirectly linked to flow proneness through its association with lower levels of self-regulatory strength. In other words, a greater tendency to avoid undesirables means that individuals have lower levels of self-regulatory strength, which in turn limits flow proneness. Whilst previous studies (e.g. Kuhnle et al., 2012; Lee, 2005; Zimmerman, 2006) provided a rationale to believe self-regulatory strength and flow proneness may be positively related, we believe that this is the first piece of research to explicitly show this relationship in a representative adult sample. Further, we demonstrated that materialistic values and levels of self-regulatory strength were negatively correlated. Whilst previous research (e.g. Rose, 2007) had documented a negative relationship between materialistic values and impulse control specifically, here we showed materialistic values to also be negatively linked to a broader measure of self-regulatory strength. Confirming a negative relationship between materialistic values and self-regulatory strength helps to explain the associations reported between materialism and poor money management (Watson, 2003) and risky health behaviours (Dittmar et al., 2014).

Limitations and Future Research

One limitation of the present study is that it is cross-sectional in nature; thus no causal inferences can be made concerning the associations between materialistic values, self-regulatory resource levels, avoidance of undesirables, and flow proneness. Further experimental work is needed to determine the directional nature of the effects reported here. For example, whilst some studies (Dholakia et al., 2006) have shown that priming a prevention regulatory focus can lead individuals to display poorer self-control, other research (Lisjack & Lee, 2014) has suggested that inducing low levels of self-control can lead to heightened feelings of vulnerability and thus motivate individuals to avoid negative outcomes in order to protect the self. The exact nature of the relationships within our final theoretical model therefore needs to be untangled.

Further, whilst we have used a sample that is representative of the British adult population and therefore our results can be generalised across the UK, whether these results will replicate across cultures is unknown. For example, it has been shown that more religious individuals tend to display greater levels of self-control (McCullough & Willoughby, 2009), and Pyle (2011) found a trend whereby individuals from individualistic cultures reported lower levels of self-control than those from collective cultures. Accordingly, in cultures whereby high levels of self-regulation are developed and promoted, this factor may not be such a common consequence of materialistic values/hindrance to flow experiences.

It is also important to acknowledge the recent debate surrounding the reliability of the strength model of self-regulation. Certain meta-analyses and multi-lab replications have failed to document consistent, meaningful ego-depletion effects (Hagger et al., 2016), whilst others argue that ego-depletion effects do exist but are small in size (Dang et al., 2019). Alternative theories of self-regulation which emphasize, for example, shifts in motivation (Inzlicht & Schmeichel, 2012) rather than a limited resource store may make different assumptions about how materialistic values can limit flow and these could be explored in future research.

Implications and conclusions

The aim of this paper was to examine the role self-regulatory resource levels and the extent to which these are used towards to avoidance of undesirables play in accounting for why people holding stronger materialistic values are less prone to experiencing flow. Our results suggested that more materialistic individuals' beliefs that negative states are best avoided were linked to lower levels of self-regulatory strength, which in turn was associated with a lower tendency to experience flow. This implies that in order to transition towards happier lifestyles we may need to either eliminate the view that negative experiences and emotions are inherently bad or find ways of improving self-regulatory strength in the population.

Eliminating the view that negative states are inherently bad is in line with the 'second wave positive psychology' movement, which states that negative emotions can also have a role to play in the good life (Lomas & Ivtzan, 2016). Public understanding of the benefits of discomfort could be increased by including content surrounding the how best to manage and utilise negative feelings (rather than avoid them) as part of mental health education in schools, for example. By reducing the desire to avoid negative experiences, more self-regulatory resources could be available for flow pursuits.

There are a number other of ways in which self-regulatory strength can be increased. Interventions often instruct participants to repeatedly partake in actions that require the overriding of a dominant response, to improve overall levels of self-regulatory

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strength (Friese et al., 2017). For example, instructing individuals to use their non-dominant hand for tasks can lead them to be better at regulating aggressive impulses (Denson et al., 2011). Mindfulness has also been suggested as a means of improving self-regulatory strength in that it requires the individual to regulate their attention such that it is solely focused on their body, thoughts or specific images (Masicampo & Baumeister, 2007). Future research testing the causal nature of the relationships within our model is needed to confirm these areas for future interventions. ■

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