Research article

Neuroticism versus emotionality as mediators of the negative relationship between materialism and well-being

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ABSTRACT

The purpose of the study was to investigate the relationship between, neuroticism, emotionality well-being and materialism. A series of mediation analyses were conducted with data obtained from a set of questionnaires completed by University students. The results indicated that neuroticism and emotionality were mediators in the well-being-materialism relationship. However, this relationship is dependent upon whether neuroticism or emotionality is measured as the three neuroticism measures utilized were significant mediators whereas the HEXACO emotionality scale was not. A facet-level analysis was conducted with the IPIP-NEO facets of volatility and withdrawal and with the HEXACO facets of sentimentality/dependence and withdrawal. In either case, withdrawal was a significant mediator in the materialism well-being relationship, whereas volatility or senti-mentality/dependence was not. The results highlight the differences between neuroticism and HEXACO emotionality and add additional insight into the relationship between materialism and lower well-being. These findings suggest possible methods of decreasing materialistic tendencies and increasing subjective well-being.

1. Introduction

Materialism is a set of values, traits, or goals that emphasize the importance of the acquisition of money and possessions (Kasser et al., 2004; Belk, 1985). Kasser et al. (2004) has defined materialism in terms of having the goals of financial success, attainment of possessions, status and image based upon the amount and quality of consumer goods. Belk (1985) defined materialism in terms of three personality traits: possessiveness, non-generosity, and envy. According to Richins and Dawson (1992), materialism is a set of values whereby the acquisition of wealth or possessions is central to one's life, a measure of personal success and a measure of happiness. One of the most replicated findings in materialism research is the negative relationship between materialism and well-being, so it is important to understand the possible underlying factors in this relationship (e.g., Dittmar et al., 2014). According to Górnik-Durose and Boron (2018) neuroticism is a major mediator in the relationship when measured by the Eysenck Personality Questionnaire (EPQ; Eysenck and Eysenck, 1994). However, this finding may depend upon the method of measurement as a recent study by Górnik-Durose and Pyszkowska (2020) found that the HEXACO emotionality scale (Ashton and Lee, 2007) did not mediate the materialism-well-being relationship. Instead, narcissism was an important mediator. The authors argue that neuroticism increases materialism through feelings of insecurity and

underestimation of resources and that narcissism decreases materialism thorough exaggeration of one's resources (Górnik-Durose and Pyszkow-ska, 2020). Therefore, the relationship between materialism, neuroticism and well-being may be more complex, with other processes involved.

Another example is a recent investigation by Watson (2020) that also found that the HEXACO emotionality scale was not a significant mediator. Instead, a future-negative temporal perspective mediated the relationship between materialism and well-being, which accords with past research that has demonstrated temporal perspective adds to the incremental validity of predicting well-being over and above the effect of personality traits (Zhang and Howell, 2011). These studies show the importance of mediating variables in the materialism-well-being relationship. They also demonstrate that the relationship obtained may depend upon the measures used, as a significant effect was obtained for neuroticism as a mediator with the EPQ in the Górnick-Durose and Boron (2018) study, but not with the HEXACO emotionality scale in research by Watson (2020) or (Górnik-Durose and Pyszkowska, 2020).

1.1. HEXACO emotionality and neuroticism

The HEXACO model of personality has a different conception of the neuroticism factor in the Five-Factor Model (FFM). The two factors have a different facet structure, emotionality is composed of four facets:

sentimentality, anxiety, dependence and fearfulness whereas neuroticism has the facets of anxiety, angry hostility, depression, self-consciousness, impulsiveness and vulnerability (Ashton and Lee, 2007; Costa and McCrae, 1992). According to Gaughan et al. (2012) a major difference between neuroticism and emotionality is that "…FFM N includes content related to the experience of both internally (e.g., anxiety) and externally directed negative affect (e.g., anger), whereas the HEXACO Emotionality domain is limited to the experience of internally directed affect (e.g., fearfulness, anxiety)…" (p. 519). This difference in facet structure may be a possible reason for the different findings with the relationship between materialism and well-being.

Ashton and Lee (2007) have an evolutionary interpretation of the trait of emotionality in that it is related to kin altruism with the facets of sentimentality and dependence. Altruism has been negatively related to materialism (e.g., Leyva, 2019) and materialism has a negative impact on interpersonal relationships (e.g., Pieters, 2013). Therefore, it is likely that the components of emotionality that are involved with attachment with others (sentimentality and dependence) will be negatively related to materialism and may have an effect upon the anxiety, fearfulness component of emotionality which is likely related to the anxiety-based or "mouse" type materialism described by Górnik-Durose and Pilch (2016). In addition, sentimentality and dependence are related to empathy and emotional attachment with other people and materialism has the effect of reducing the connections with others (e.g., Mikulincer and Shaver, 2008). Therefore, these facets are not likely to be related to materialism. These are possible reasons for a lack of mediation with emotionality in the materialism well-being relationship with the HEXACO emotionality scale in the Górnik-Durose and Pyszkowska (2020) and Watson (2020) studies.

1.2. Facet-level personality analysis and well-being

The relationship between well-being and personality has been examined at the facet-level of personality. According to Sun et al. (2018) neuroticism can be divided into volatility (calmness, angry hostility, tranquility, impulse control) and withdrawal (depression, anxiety and self-consciousness). The withdrawal facet was strongly negative related to well-being whereas the volatility facet had a much smaller relationship with well-being. Given these findings it is likely that withdrawal will mediate the relationship between materialism and well-being rather than the volatility facet. The withdrawal facet is more likely to be related to the anxiety-based "mouse" type materialist versus the more grandiose "peacock" type materialist described by Górnik-Durose and Pilch (2016). As these two sets of facets may have a different relationship between materialism and well-being compared to the full measures and as the HEXACO model has a different facet structure compared to the five-factor model, a facet-level analysis may provide some additional insight into the materialism-well-being relationship.

1.3. The current study

Therefore, the purpose of the study is to further examine the relationship between materialism and well-being, with neuroticism and emotionality as potential mediators. Several different measures of both neuroticism or emotionality and well-being will be used to ensure replicability of the results. The following hypotheses are proposed.

Hypothesis 1. Neuroticism will mediate the materialism-well-being relationship, however this may not be the case with the HEXACO emotionality scale.

Hypothesis 2. A facet-level analysis of neuroticism and emotionality will demonstrate that the withdrawal facet will mediate the materialism well-being relationship rather than the volatility facet of Neuroticism or sentimentality/dependence facet of the HEXACO.

2. Method

2.1. Participants

Undergraduate University participants, $n = 433$, received experimental credit in introductory psychology for completion of a set of questionnaires with the Qualtrics online platform at a Western Canadian University. The student composition of the University is 80% non-minority and 20% visible minority students, including 6% aboriginal students. Eight participants were removed from the dataset due to incomplete data, leaving a final number of $n = 425$ participants. The participants completed an online informed consent form and were free to withdraw from the study at any time without consequence and participation was completely voluntary. Participants needed to be 18 years and older to be included in the study. The average age of the participants was mean $= 21.05$, SD $= 4.68$, the age range was from 18-54 years. Of these participants, 88.9% were between 18 and 25 years of age, 67.5% were female, 8 participants did not indicate a gender. The study was approved by The MacEwan University Research Ethics Board.

2.2. Measures

2.2.1. Materialism

Belk Materialism Scale: provides an overall materialism score and three subscales which measure possessiveness, non-generosity, and envy (Belk, 1984, 1985). This 24-item test uses a 1–5 Likert scale. The internal reliability of the scale is $\alpha = .66$ for the full scale (Belk, 1985). Richins and Dawson (1992) obtained a median alpha of $\alpha = .62$ with several samples. The Belk (BMS) has items that are more heterogeneous and uses a more indirect method of measuring materialism, a combination of three traits: possessiveness, non-generosity and envy. Therefore, to address this limitation, the Material Values Scale (MVS) and the Revised Materialism scale were used as well.

Material Values Scale (MVS): has 15-items providing an overall materialism score and measures the values of success, centrality and happiness (Richins and Dawson, 1992; Richins, 2004). The measure uses a 1 to 5 Likert-type scale. For the overall test, the alpha is $\alpha = .86$ (Richins, 2004).

Revised Materialism-Post Materialism Scale (Giacalone and Jurkiewicz, 2004), has a 14-item materialism subscale that was used in this study. The materialism scale is based upon Inglehart's (1977) theory of materialism-post materialism, and therefore measures the values of material and economic rewards, prosperity, control, economic security as opposed to the post-materialist values of community, self-expression and equality. The authors reported a Cronbach's alpha of $\alpha = .86$ for the materialism scale.

2.2.2. Neuroticism measures

The emotionality scale of the 100-item version of the HEXACO-PI-R was used in the study (Ashton and Lee, 2007). The instrument uses a 1–5 Likert scale and measures the six-factor domains: honesty-humility, emotionality, extraversion, agreeableness, conscientiousness and openness to experience. Each domain has 4 facet scores; for example, emotionality has sentimentality, anxiety, dependence and fearfulness facets. The test has demonstrated reliability and validity in terms of internal reliability, temporal stability, predictive and factorial validity (Ashton et al., 2014).

IPIP-NEO (Johnson, 2014). International Personality Item Pool NEO-PI version-120 (IPIP-NEO-120; Johnson, 2005). The 120-item version has 24 items per factor and 4 items for each of the 30 FFM facets. Johnson (2005) reported full scale alpha reliability ranging from $\alpha = .82$ to .90 and facet reliability from $\alpha = .62$ to .86. Maples et al. (2014) reported evidence of convergent validity with NEO-PI-R and criterion validity for the IPIP-NEO.

Big Five Personality Inventory (Big 5- N; John et al., 2008). This is a 44-item inventory which measures the five-factor model of personality.

According to Feldt et al. (2014) the test has evidence of criterion validity with the facet scores and the neuroticism scale had an alpha of $\alpha = .83$.

The Eysenck Personality Questionnaire (Eysenck and Eysenck, 1994) is a 100- item scale designed to measure Eysenck's three-factor model of psychoticism, extraversion and neuroticism. For this study, only the 28-item neuroticism scale was used. Eysenck and Eysenck (1994) reported a Cronbach's alpha reliability of $\alpha = .86$ for the neuroticism scale.

2.2.3. Well-being measures

Mental Health Continuum Short Form (MHC-SF, Keyes, 2005): is a 14-item questionnaire that measures social, psychological and emotional well-being. The scale uses a 6-point Likert scale ranging from 'never' to 'every-day' in terms of feelings of well-being. The test has demonstrated reliability, validity, and longitudinal stability (Lamers et al., 2011).

Satisfaction with Life Scale (SWLS; Diener et al., 1985): is a 5-item instrument measuring overall life satisfaction using a (1 = strongly disagree to 7 = strongly agree) Likert scale. The authors reported an alpha of $\alpha = .87$. The test also shows evidence of convergent validity as Diener et al. (1985) reported moderate to strong correlations with several other measures of life satisfaction.

SPANE: Scale of Positive and Negative Experience (Diener et al., 2010) has a scale of positive feelings, negative feelings, and an affect balance scale. The authors provided evidence of reliability and validity of the SPANE with 6 different samples Diener et al. (2010).

Purpose in Life Scale (PLS): Crumbaugh (1968). This is a 20-item scale designed to measure meaning and purpose in life. Zika and Chamberlain (1992) provided evidence of convergent validity with a set of wellbeing and meaning in life measures. Giacalone and Jurkiewicz (2004) reported a Cronbach's alpha of $\alpha = .90$ for the measure.

3. Results

3.1. Descriptive statistics

Descriptive statistics and gender comparisons are presented in Table 1. The majority of the scales had no gender differences with the exception of significantly higher scores with the neuroticism and emotionality scales in the case of the females, which is consistent with previous literature (e.g., Weisberg et al., 2011; Lynn and Martin, 1997). Males had slightly higher scores on the Revised Materialism

Scale (REV) which is has been found in a previous study by Watson (2020).

The correlations are presented in Table 2. There was an inverse relationship between the well-being measures and the BMS and MVS and a positive relationship between the BMS and MVS and the neuroticism measures. The PLS was related to the REV, but with the remaining correlations, there is no relationship with the well-being measures and the REV. The neuroticism measures were all weakly related to the REV, unlike the Belk and MVS which overall, had stronger relationships with neuroticism or emotionality.

As the study consists of entirely questionnaire data, common method variance is a possible limitation of the study. Harman's single factor test was conducted using principal components analysis (PCA) with a varimax rotation. The results revealed a three-factor solution accounting for 75.39% of the variance: a well-being factor (35.11% of the variance accounted for), a materialism factor (20.28%) and a neuroticism factor (20.00 %). These results show that even though these are all questionnaires, and hence a common method, they are different in what they measure overall.

3.2. Mediation analyses

The relationship between materialism and well-being with neuroticism and emotionality as mediating variables was examined with a series of mediation analyses using the Hayes (2018) PROCESS module. Bootstrap analysis with 10,000 samples revealed that IPIP-N, EPQ-N and Big-5-N were significant mediators in the materialism-well-being relationship with the three materialism scales and the SWLS, KEYES, PLS and SPANE as measures of well-being, see Figure 1.

In support of Hypothesis 1, neuroticism is a significant mediator in the materialism well-being relationship, see Table 3. The data show that in many cases, the indirect effect of neuroticism in the materialism-well-being relationship is significantly greater than the direct effect of materialism on well-being. In terms of the size of the units, these are arbitrary according to Hayes (2018), the size is dependent upon the units of the X (materialism) and Y (well-being) variables. The important issue is the significance of these indirect effects. In terms of the size of the indirect effects, these results are similar to some of the significant indirect effects obtained by e.g., Górnik-Durose and Boron (2018); Górnik-Durose (2019) using some of the same instruments, the MVS, EPQ and MHC-SF.

Table 1. Means and standard deviation for all measures.

	α	Males $n = 131$	Females $n = 287$	Total $n = 418$	F	p	d
BMS	.65	71.96 (8.45)	72.09 (8.45)	72.06 (8.41)	.06	.93	
MVS	.83	43.98 (8.20)	42.21 (7.90)	42.73 (7.99)	2.45	.09	
REV Mat.	.90	35.13 (9.53)	32.01 (8.85)	32.88 (9.24)	10.67	.00	.34
MHC-SF	.92	53.32 (13.97)	52.50 (12.69)	52.72 (13.01)	.24	.78	
SWLS	.80	16.14 (3.46)	16.84 (3.48)	16.61 (3.47)	1.85	.15	
Purpose Life	.89	40.91 (7.77)	41.67 (7.73)	41.44 (7.72)	.45	.64	
SPANE Pos.	.88	20.51 (4.28)	21.04 (4.10)	20.88 (4.15)	.77	.46	
HEXACO E.	.82	49.32 (9.18)	56.19 (7.92)	54.09 (8.94)	30.86	.00	.80
Sent./Depend.	.79	24.10 (5.55)	27.72 (5.01)	26.61 (5.5)	22.20	.00	.68
HWithdrawal	.74	25.21 (5.35)	28.46 (4.73)	27.27 (5.15)	19.91	.00	.64
Big 5 Neur.	.82	23.97 (6.00)	26.89 (6.01)	26.01 (6.16)	10.95	.00	.49
IPIP Neur.	.91	68.27 (13.77)	72.28 (14.82)	71.06 (14.64)	3.52	.03	.21
Volatility	.77	22.97 (4.68)	24.19 (5.38)	23.79 (5.19)	2.61	.07	
Withdrawal	.91	45.30 (11.14)	48.09 (11.30)	47.27 (11.34)	3.08	.05	.25
EPQ Neur.	.87	12.35 (5.82)	14.65 (5.31)	13.93 (5.59)	7.79	.00	.41

Note: 1 Cohen's *d* effect size. BMS = Belk Materialism Scale, MVS = Material Values Scale, Rev Mat. = Revised Materialism Scale, MHC-SF = Mental Health Continuum, Short-Form, SWLS = Satisfaction with Life Scale, SPANE Pos. = Scale of Positive and Negative Experience, positive scale. HEXACO E. = emotionality scale, Sent./Depend. = HEXACO Sentimentality/Dependence Facets, HWithdrawal = HEXACO Withdrawal Facets, Big-5 Neur. = Big 5 Test Neuroticism Scale, IPIP Neur. = International Personality Item Pool-Neo Neuroticism scale, Volatility = IPIP Volatility Facets, Withdrawal = IPIP Withdrawal Facets, EPQ Neur. = Eysenck Personality Questionnaire Neuroticism Scale.

Table 2. Correlations for all measures.

		1	2	3	4	5	6	7	8	9	10	11
1	BMS											
2	MVS	.44*										
3	REV.	.38*	.65*									
4	MHC-SF	-.27*	-.10	-.05								
5	SWLS	-.16*	-.19*	-.03	.59*							
6	PLS	-.30*	-.14	-.16*	.78*	.62						
7	Spanepos	-.24*	-.09	-.05	.75*	.60	.70					
8	HexacoE	.22*	.17*	.05	-.07	-.05	-.05	-.04				
9	Big5-N	.32*	.15*	-.02	-.48*	-.41	-.48	-.48*	.55*			
10	IPIP-N	.41*	.27*	.16*	-.57*	-.48	-.62	-.52*	.48*	.78*		
11	EPQ-N	.37*	.25*	.10	-.47*	-.44	-.48	-.46*	.50*	.73*	.79*	

Note: *Correlations above r = .15 are significant with the Bonferroni correction. BMS = Belk Materialism Scale, MVS = Material Values Scale, REV. = Revised Materialism Scale. Scale, MHC-SF = Mental Health Continuum, Short-Form, SWLS = Satisfaction with Life Scale, SPANE Pos. = Scale of Positive and Negative Experience, positive scale SPANE-N. = Scale Positive and Negative Experience, negative scale. HEXACO E. = emotionality scale, Big-5-N. = Big 5 Test Neuroticism Scale, IPIP-N = International Personality Item Pool-Neo Neuroticism scale, EPQ-N. = Eysenck Personality Questionnaire Neuroticism Scale.
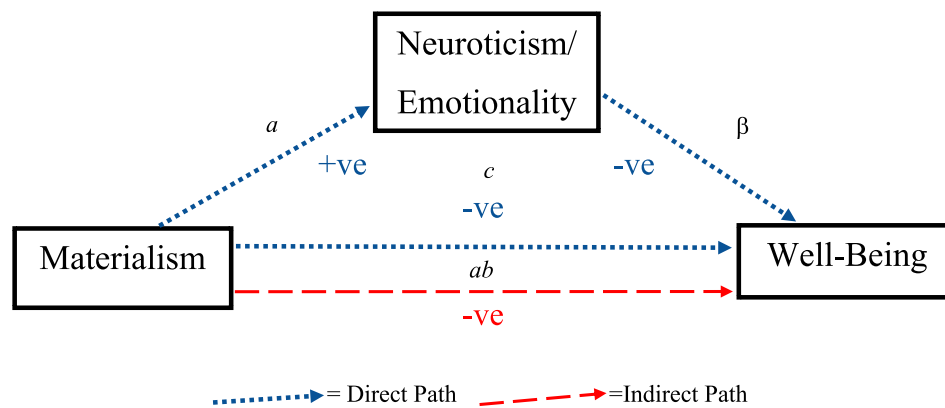

Figure 1. Proposed model between materialism, neuroticism and well-being.

With the Belk and MVS, the results of the indirect effect of neuroticism were highly significant. However, with the REV scale, the relationships were considerably weaker and in the case of the BIG-5 neuroticism scale, the results were non-significant. The difference in item content between the REV and the Belk and MVS, and the Big 5-N and the other neuroticism measures could be reasons for these weaker or non-significant relationships.

Also, in support of Hypothesis 1, the HEXACO emotionality scale was not a significant mediator in this relationship with any of the measures. These results may be due to a different conception of emotionality in relation to neuroticism. As neuroticism and HEXACO-emotionality have different facets, a facet-level analysis was conducted with the HEXACO- emotionality scale and the IPIP-N scale, see Figure 2.

3.2.1. Facet-level analysis

The same series of mediation analyses were performed at the facet-level with the IPIP-NEO divided into withdrawal (anxiety, depression, self-consciousness, vulnerability) and volatility (anger and immoderation). The HEXACO was divided into withdrawal (anxiety and fearfulness) and dependence/sentimentality as the HEXACO does not have volatility facets.

In support of Hypothesis 2, withdrawal was a significant indirect mediator, whereas volatility was not. Likewise, with the HEXACO withdrawal is a significant mediator between materialism and wellbeing, dependence/sentimentality are not, see Table 4.

3.2.2. Gender differences

Given the gender differences in neuroticism and emotionality, all mediation analyses were also conducted with males and females separately. Overall, the results are very similar. The female mediations were virtually identical to the overall results. With the males, the differences were noted in Tables 3 and 4. The general trend is that the weaker, significant indirect effects were non-significant with the male portion of the sample.

4. Discussion

The study provided evidence for both Hypothesis 1 and 2 as neuroticism was a mediator in the materialism well-being relationship with three different measures of neuroticism. A facet-level analysis showed that withdrawal was a mediator in the relationship rather than volatility or dependence/sentimentality. The results highlight some of the differences between the HEXACO conception of emotionality and the personality trait of neuroticism in the FFM and how the two different, but correlated factors mediate the relationship between materialism and well-being. Overall, HEXACO emotionality does not mediate the relationship between materialism and well-being, but the three measures of neuroticism employed in this study are either full or partial mediators in this relationship. These results are like those found in the Górnik-Durose and Pyszkowska (2020) and Watson (2020) studies.

With the facet-level of analysis, the withdrawal facet of either the HEXACO or the IPIP-NEO were significant mediators in the materialism-

Table 3. Mediation analyses: Materialism predicting well-being with neuroticism measures as mediators.

HEXACO Emotionality	Bootstrap results for indirect effects (95 % CI)						
	c' path	*a*-path	*b*-path	*ab*	Lower	Upper	Sobel Z
	(Direct Effect)			(Indirect Effect)			
BMS, HEX-E, SWLS	-.06*	.24	-.01	-.00	-.01	.01	-.42
MVS, HEX-E, SWLS	-.08*	.19	.01	-.00	-.01	.01	-.45
REV., HEX-E, SWLS	-.01	.01	-.02	-.00	-.01	.01	-.08
BMS, HEX-E, MHC-SF	-.41	.24	-.02	-.01	-.04	.03	-.29
MVS, HEX-E, MHC-SF	-.14	.19	-.09	-.01	-.06	.08	-1.09
REV., HEX-E, MHC-SF	-.07	.01	-.10	-.00	-.02	.02	-.09
BMS, HEX-E, PLS	-.27*	.24	.01	.00	-.00	.00	.32
MVS, HEX-E, PLS	-.13*	.19	-.03	.00	-.03	.01	-.57
REV.,HEX-E, PLS	-.14*	.01	-.04	.00	-.01	.01	-.08
BMS, HEX-E,Spane-P	-.12*	.24	.02	.00	-.01	.01	.29
MVS, HEX-E, Spane-P	-.05	.19	-.01	-.00	-.01	.01	-.40
REV., HEX-E, Spane-P	-.02	.01	-.02	-.00	-.00	.00	-.06

IPIP Neuroticism	Bootstrap results for indirect effects (95 % CI)						
	c' path	*a*-path	*b*-path	*ab*	Lower	Upper	Sobel Z
	(Direct Effect)			(Indirect Effect)			
BMS, IPIP-N, SWLS	.02	.71	-.12	-.08	-.11	-.06	-6.97***
MVS, IPIP-N, SWLS	-.03	.48	-.11	-.05	-.07	-.03	-4.96***
REV., IPIP-N, SWLS$_a$	.02	.25	-.12	-.03	-.05	-.01	-3.18***
BMS, IPIP-N, MHC-SF	.06	.71	-.50	-.35	-.46	-.26	-7.49***
MVS, IPIP-N, MHC-SF	.10	.48	-.52	-.26	-.36	-.15	-5.29***
REV., IPIP-N, MHC-SF$_a$	.07	.25	-.52	-.13	-.22	-.05	-3.24**
BMS, IPIP-N, PLS	-.05	.71	-.32	-.23	-.26	-.17	-7.75***
MVS, IPIP-N, PLS	.03	.49	-.33	-.16	-.23	-.10	-5.32***
REV.,IPIP-N, PLS$_a$	-.05	.25	-.32	-.08	-.14	-.03	-3.25**
BMS, IPIP-N,Spane-P	-.01	.71	-.14	-.10	-.13	-.08	-7.11***
MVS, IPIP-N, Spane-P	.03	.49	-.15	-.07	-.10	-.05	-5.14***
REV., IPIP-N, Spane-P$_a$	.02	.25	- .15	-.04	-.06	-.01	-3.21**

EPQ-Neuroticism	Bootstrap results for indirect effects (95 % CI)						
	c' path	*a*-path	*b*-path	*ab*	Lower	Upper	Sobel Z
	(Direct Effect)			(Indirect Effect)			
BMS, EPQ-N, SWLS	-.01	.25	-.27	-.07	-.09	-.05	-6.14***
MVS, EPQ-N, SWLS	-.04	.18	-.26	-.05	-.07	-.03	-4.58***
REV., EPQ-N, SWLS$_a$	.01	.06	-.27	-.02	-.03	-.00	-1.96*
BMS, EPQ-N, MHC-SF	-.17*	.25	-.99	-.24	-.33	-.17	-6.12***
MVS, EPQ-N, MHC-SF	.03	.18	-1.09	-.19	-.28	-.12	-4.73***
REV., EPQ-N, MHC-SF$_a$	-.01	.06	-1.08	-.06	-.14	.00	-1.97*
BMS, EPQ-N, PLS	-.13*	.25	-.59	-.15	-.20	-.11	-6.18***
MVS, EPQ-N, PLS	-.02	.18	-.66	-.12	-.17	-.07	-4.75***
REV.,EPQ-N, PLS$_a$	-.10*	.06	-.65	-.04	-.08	.00	-1.97*
BMS, EPQ-N,Spane-P	-.04	.25	-.32	-.08	-.11	-.06	-6.18***
MVS, EPQ-N, Spane-P	-.01	.18	-.35	-.06	-.08	-.04	-4.73***
Rev.,EPQ-N,Spane-P$_a$	-.01	.06	-.34	-.02	-.04	.00	-1.97*

Big-Five Neuroticism	Bootstrap results for indirect effects (95 % CI)						
	c' path	*a*-path	*b*-path	*ab*	Lower	Upper	Sobel Z
	(Direct Effect)			(Indirect Effect)			
BMS, Big-Five-N, SWLS	-.01	.23	-.23	-.05	-.07	-.04	-5.33***
MVS, Big-Five-N, SWLS$_a$	-.06	.11	-.22	-.02	-.04	-.01	-2.84*
REV., Big-Five-N, SWLS $_a$	-.01	-.01 ns	-.23	.002	-.013	.02	0.35
BMS, Big-Five-N, MHC-SF	-.20*	.23	-.93	-.22	-.30	-.14	-5.63***
MVS, Big-Five-N, MHC SF$_a$	-.05	.11	-1.0	-.11	-.20	-.03	-2.90*
REV, Big-Five-N, MHC-SF$_a$	-.08	-.01 ns	-1.0	.01	-.06	.08	0.35
BMS, Big-Five-N, PLS	-.15*	.23	-.54	-.12	-.17	-.08	-5.58***
MVS, Big-Five-N, PLS$_a$	-.07*	.11	-.59	-.06	-.12	-.02	-2.90*
REV., Big-Five-N, PLS$_a$	-.14*	-.01	-.61	.01	-.03	.04	0.35
BMS, Big-Five-N,Spane-P	-.05*	.23	-.30	-.07	-.10	-.05	-5.63***
MVS, Big-Five-N, Spane-P	-.01	.11	-.32	-.04	-.06	-.01	-2.90*
REV., Big-Five-N, Spane-P$_a$	-.03	-.01	-.32	-.01	-.02	.03	0.35

Note: * = significant *c'* direct effect, a = non-significant indirect mediation with males, *n* = 138, Significant Sobel Z test, * = *p* < .05, ** = *p* < .01, *** = *p* < .001, SWLS = Satisfaction with Life Scale, BMS = Belk Materialism Scale, MVS = Material Values Scale, REV. = Revised Materialism Scale, HEX-E = HEXACO Emotionality Scale, PLS = Purpose in Life Scale, Spane-P = Scale of Positive and Negative Experience, Positive experience scale, MHC-SF = Mental Health Continuum Short Form, IPIP-N = International Personality Item Pool, Neuroticism Scale. EPQ-N = Eysenck Personality Questionnaire, Neuroticism Scale, Big-Five-N = Big Five Inventory Neuroticism Scale.
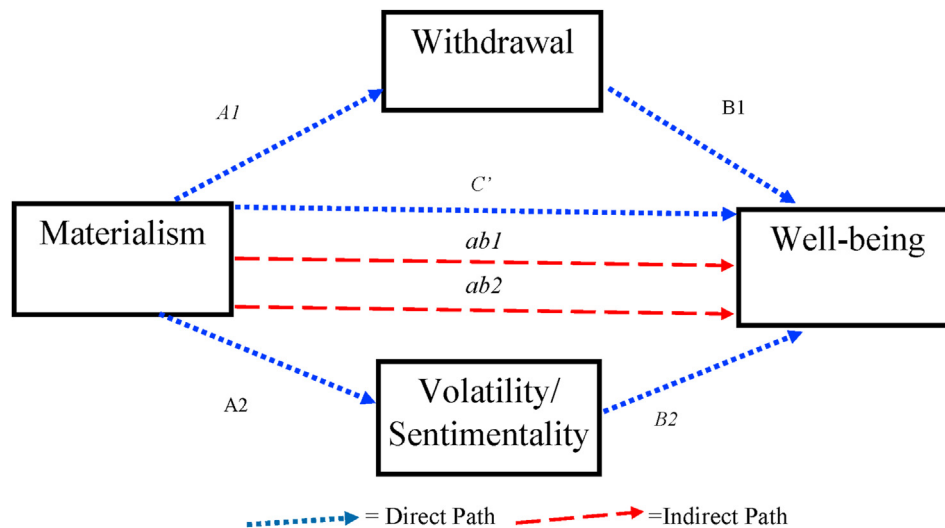
Figure 2. Proposed model between materialism and well-being with neuroticism/emotionality facets as mediators.

well-being relationship but the volatility or the dependence/sentimentality facets were not significant mediators. Gaughan et al. (2012) argue that the main difference between the FFM neuroticism and the HEXACO emotionality is that the FFM is both external and internally directed affect and that the HEXACO is only internally directed. This research is consistent with this assertion as the internal component, withdrawal was a mediator of the materialism well-being relationship with both models of personality, whereas the external volatility component of the FFM was not. Dependence and sentimentality are the second component of the HEXACO model, and it could be argued that these also are more externally directed as they are related to attachment and bonding with others. These results are consistent with research that has indicated that the sentimentality facet of the HEXACO is related to having emotional attachment and empathy for others (Ashton et al., 2014). Materialism has been related to less empathy and anxious attachment with others (e.g., Can, 2013; Norris et al., 2012). The facets of sentimentality and dependence which are related to having emotional bonds with others (Ashton et al., 2014) therefore, it is understandable that these were not mediators in the materialism-wellbeing relationship. Therefore, the results with the HEXACO facets are consistent with Gaughan et al. (2012) as well. Overall, when the more traditional neuroticism components that are within the HEXACO model notion of emotionality are examined, the scale is similar to the three neuroticism scales in terms of mediating the relationship between materialism and well-being.

4.1. Implications

The HEXACO model has produced different findings when compared to the FFM in other research and this addition can have greater utility in terms of understanding. For example, Gaughan et al. (2012) found that emotionality correlates more strongly with psychopathy compared to FFM neuroticism due to the facets of sentimentality, fearfulness and dependence which are salient traits negatively related to psychopathy. Therefore, there is utility in the HEXACO model using a different method of parsing out emotionality into specific facets. In addition, the splitting into sentimentality/dependence versus withdrawal demonstrates the utility of the HEXACO model as it shows that withdrawal is a factor in the materialism well-being relationship whereas sentimentality/dependence is not. Analysis with the FFM neuroticism also shows the importance of the withdrawal facets, however these are contrasted with a different set of facets with volatility. Therefore, in using both models the importance of the withdrawal facets compared to sentimentality/dependence and

volatility is emphasized. In research in other domains has also shown the utility of interpretation of psychological characteristics using both the FFM and the HEXACO, (e.g., belief in a just world, Bollman et al., 2015; RIASEC vocational interests, McKay and Tokar 2012; phobic tendency, Ashton et al., 2008).

4.2. Limitations

The study is limited by the cross-sectional nature of the data and the age of the participants. Also, the study is based upon a University sample with no inclusion criteria other than being 18 years of age or older. This can be considered a limitation as socioeconomic status or other factors such as neurological or psychological disorders were not controlled for. Another limitation is the issue of common method variance as the data consists of entirely self-report questionnaires. Although PCA demonstrated that this set of questionnaires were three separate types of instruments, well-being, materialism and neuroticism, the results would be strengthened using a mixture of methods such as experimental manipulation, experience sampling, the use of both informant and self-report questionnaires.

According to Hayes (2018); Hayes and Rockwood (2017), mediation analyses can be used with a cross-sectional research design. However, these findings would be further strengthened with longitudinal designs which in the past, have demonstrated a relationship between materialism and lower well-being with psychological needs satisfaction as a mediator. Neuroticism and emotionality are indicators of a lack of psychological needs satisfaction which has been shown to mediate the relationship in a longitudinal study (Wang et al., 2017). The research of Górnik-Durose and Pyszkowska (2020) demonstrated that another source of psychological needs dissatisfaction, narcissism is an important mediator in the materialism well-being relationship.

4.3. Future directions

Future investigations could examine the connection between materialism, neuroticism and well-being with longitudinal design and a more diverse population. Experimental designs could also be implemented to temporarily induce materialistic cognitions and test the meditating effect of neuroticism or HEXACO emotionality facets on measures of well-being. With further cross-sectional research, additional validation of this research could be conducted using other inventories to assess the FFM such as the NEO-PI-3 (McCrae et al., 2005) inventory to ensure the

Table 4. Mediation analyses: Materialism predicting well-being with HEXACO-emotionality facets and IPIP-Neo neuroticism facets as mediators.

HEXACO Facets Withdrawal, Sentimentality	Bootstrap results for indirect effects (95% CI)									
	c' path	$a1$	$a2$	$b1$	$b2$	$ab1$	$ab2$	HW	Sobel $Z_{(HW)}$	HS ns
	(Direct Effect)					(Indirect effects)				
BMS, HW, HS, SWLS	-.03	.23	.01	-.15	.11	-.03	.00	-.06,-.02	-3.5***	-.01-.01[b]
MVS, HW, HS, SWLS	-.07*	.13	.06	-.15	.12	-.02	.00	-.04,-.01	-3.5***	-.00,.02[b]
REV., HW, HS, SWLS[a]	-.00	.03	-.03	-.17	.12	-.00	-.00	-.02, .00	-1.2	-.01,.00[b]
BMS, HW, HS, MHC-SF	-.27*	.23	.01	-.64	.49	-.15	.00	-.23,-.08	-3.9***	-.03,.04[b]
MVS, HW, HS MHC-SF	-.09*	.13	.06	-.80	.57	-.10	.04	-.18,-.05	-3.4***	-.00,.09[b]
REV., HW, HS MHC-SF[a]	-.02	.03	-.03	-.83	.56	-.03	-.02	-.08, .02	-1.2	-.06,.02[b]
BMS, HW, HS, PLS	-.19*	.23	.01	-.39	.35	-.09	.00	-.14,-.05	-4.1***	-.02,.03[b]
MVS, HW, HS, PLS	-.09	.13	.06	-.50	.40	-.06	.03	-.11,-.03	-3.5***	-.00,.06[b]
REV.,HW, HS, PLS[a]	-.11*	.03	-.03	-.50	.38	-.02	-.01	-.05, .01	-1.2	-.04,.01[b]
BMS, HW, HS, Spane-P	-.07*	.23	.01	-.21	.18	-.05	.00	-.07,-.03	-4.0***	-.12,.02[b]
MVS, HW, HS, Spane-P	-.03	.13	.06	-.25	.20	-.03	.01	-.05,-.02	-3.4***	-.00,.03[b]
REV., HW, HS, Spane-P[a]	-.00	.03	-.03	-.26	.20	-.00	-.00	-.02, .00	-1.2	-.02,.00[b]

IPIP Facets Withdrawal, Volatility	Bootstrap results for indirect effects (95% CI)									
	c' path	$a1$	$a2$	$b1$	$b2$	$ab1$	$ab2$	IPW	Sobel $Z_{(IPW)}$	IPV ns
	(Direct Effect)					(Indirect effects)				
BMS, IPW, Vol., SWLS	.02	.53	.18	-.14	-.06	-.07	-.01	-.10,-.05	-6.2***	-.02,.00[b]
MVS, IPW, Vol., SWLS	-.04*	.25	.23	-.13	-.03	-.03	-.01	-.06,-.15	-3.5***	-.02,.01[b]
REV., IPW, Vol., SWLS[a]	.01	.12	.13	-.13	-.06	-.02	-.01	-.03, .00	-2.0*	-.02,.00[b]
BMS, IPW, Vol., MHC-SF	-.05	.53	.18	-.66	-.04	-.35	-.01	-.45,-.26	-7.1***	-.05,.03[b]
MVS, IPW, Vol., MHC-SF	.03	.25	.23	-.67	-.07	-.17	-.02	-.29,-.07	-3.7***	-.07,.04[b]
REV., IPW, HS, MHC-SF[a]	.02	.12	.13	-.06	.02	-.08	-.01	-.17, .00	-2.0*	-.04,.02[b]
BMS, IPW, HS, PLS	-.05	.53	.18	-.40	-.09	-.21	-.02	-.27,-.16	-7.2***	-.05,.00[b]
MVS, IPW, HS, PLS	-.00	.25	.23	-.41	-.10	-.11	-.02	-.17,-.04	-3.7***	-.06,.00[b]
REV.,IPW, HS, PLS[a]	-.08*	.12	.13	-.41	-.07	-.05	-.01	-.10, .00	-2.0*	-.03,.00[b]
BMS, IPW, HS, Spane-P	-.01	.53	.18	-.19	-.01	-.10	-.00	-.13,-.07	-6.8***	-.02,.01[b]
MVS, IPW, HS, Spane-P	.00	.25	.23	-.19	-.02	-.05	-.00	-.08.-.02	-3.6***	-.02,.02[b]
REV., IPW, HS, Spane-P[a]	.00	.12	.13	-.19	-.02	-.02	-.00	-.05, .00	-2.0*	-.01,.00[b]

Note: * = significant c' direct effect, a = non-significant indirect mediation with males, $n = 138$, Significant Sobel Z test, * = $p < .05$, ** = $p < .01$, *** = $p < .001$. b = non-significant indirect effect for HS and IPV, SWLS = Satisfaction with Life Scale, BMS = Belk Materialism Scale, MVS = Material Values Scale, REV. = Revised Materialism Scale, HW = HEXACO withdrawal facet, HS = HEXACO Sentimentality/dependence facet. PLS = Purpose in Life Scale, Spane -P = Scale of Positive and Negative Experience, Positive experience scale, IPW = International Personality Item Pool, Withdrawal Facet, IPV = IPIP Volatility facet, MHC-SF = Mental Health Continuum-Short Form.

replicability of these findings. In terms of possible therapeutic interventions directed at increasing well-being, the facet-level analyses show that interventions focusing upon the facets of withdrawal are potentially more effective than volatility. Also, the findings with sentimentality/dependence suggest that interventions focusing upon increasing attachment and empathy for others could possibly aide in decreasing materialistic tendencies and increasing feelings of well-being.

Declarations

Author contribution statement

David C. Watson: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Data availability statement

Data will be made available on request.

Declaration of interests statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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