Individual Difference Factors and Beliefs in Medical and Political Conspiracy Theories.

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Abstract

This study examined the relationship between a series of individual difference measures and belief in political and medical conspiracy theories. Participants (*N*=323) rated 20 conspiracy theories (10 medical, 10 political) and completed a set of questionnaires. Belief in political conspiracies was strongly positively correlated with belief in medical conspiracies. Belief in both conspiracy types was correlated with low self-esteem, low Conscientiousness, more right-wing political views, younger age, and greater belief in the benefits of Alternative Medicine. It was also correlated with religiousness and gender. Low Emotional Stability and Agreeableness were also correlated with belief in political conspiracies, and higher education level was correlated with belief in medical conspiracies. The findings generally demonstrated support for a monological belief system. Implications and limitations are discussed.

Introduction

Conspiracy theories (CTs) are usually referred to as a set of beliefs where the cause of an event is thought to be due to a secret plot by multiple people working with a clear goal in mind, (Sunstein & Vermeule, 2009). It is generally agreed that conspiracy theories form part of a monological belief system: people adopt a conspiracist worldview tending to accept or reject all types of conspiracy theories (Goertzel, 1994; Swami et al., 2011; Wood, Douglas & Sutton, 2012). Sunstein and Vermeule (2009) suggested that belief in conspiracies are a means for people who feel powerless or disadvantaged, to explain events that are difficult to conceive of, such as terrorist acts (Uscinski & Parent, 2014; Sullivan, Landau & Rothschild, 2010).

Over the past five years there has been a great increase in psychological studies on CTs (Barron et al., 2014; Brotherton & French, 2014; Douglas et al., 2016;van Prooijen, et al., 2015). They have been concerned with the measurement of CTs, as well as individual difference correlates of those beliefs, including self-assessments such as the need for uniqueness (Imhoff & Lamberty, 2017)

This study aims to replicate and extend studies on the correlates of CTs. We examined self-esteem and personality trait correlates to replicate other studies in this area. Conspiracist ideation has been linked to self-esteem maintenance, where believing that others have engaged in malevolent action means the individual who holds the conspiracist belief experiences a more positive self-image (Robins & Post, 1997). With regards to personality factors, low Agreeableness and high Openness to experience have also been found to be associated with 9/11 conspiracist beliefs (Swami et al. 2010). Exposure to conspiracy theories about the government decreases trust in the government and can have immediate and long-term negative effects on political attitudes and engagement (Einstein & Glick, 2015; Jolley & Douglas, 2014a; Kim & Cao, 2016). In this study we examined both political involvement (how many times they have voted) as well as political beliefs (left vs right wing).

Studies show a strong association between conspiracy beliefs and greater belief in pseudoscience (Lobato, Mendoza, Sims & Chin, 2014). As alternative medicine is not based on scientific evidence and various studies have suggested that individuals seek the use of alternative medicine to gain control and empowerment (Andrews, 2002; Bishop, Yardley & Lewith, 2007; Thompson, 2003). We believe this is a unique contribution to this literature.

Further, the relationship between demographic factors and conspiracist belief has been explored. The tendency to attribute agency and intentionality where it does not exist (known as 'hypersensitive agency detection') has been found in individuals who were more likely to believe in a range of conspiracy theories, and this was accounted for by lower education level (Douglas, Sutton, Callan, Dawtry & Harvey, 2016). Beliefs in conspiracy theories may be influenced by improved education (Bartlett & Miller, 2010).

The tendency to assign agency and intentionality where it does not exist is linked to conspiracy belief. This tendency has been used to explain why people are religious and superstitious (Barrett, 2007), and thus may explain why conspiracist beliefs are consistently found in individuals who also hold religious beliefs and beliefs in the paranormal (Darwin, Neave & Holmes, 2011; Stieger, Gumhalter, Tran, Voracek & Swami, 2013). In this study we looked at how religious people said they were and its relationship to beliefs in both CTs.

Current Study

This study aims to investigate the relationships between individual difference factors and belief in two conspiracy theory types, political (involving action by the government) and medical (involving action by the medical or pharmaceutical industry). Medical conspiracy theories were chosen partly due to differing results observed with regards to education (Klonoff & Landrine, 1999), and in part because belief in them has, like political conspiracies, been

associated with negative consequences, such as not receiving advised healthcare (Jolley & Douglas, 2014b). We used step-wise regressions to explore to what extent personality variables and political/medical beliefs showed incremental validity over standard demographic variables.

It was firstly predicted that belief in both CTs would be negatively correlated with Agreeableness (Hypothesis 1A), and Self-esteem (Hypothesis 1B), but positively correlated with Openness to Experience (Hypothesis 1C). The second hypothesis was that education qualification would be negatively correlated with belief in political and medical conspiracy theories (H2). These hypotheses attempt to replicate previous studies using different CTs, populations and measures of personality (Swami et al., 2010)

The third hypothesis was that religiousness would be positively associated with conspiracy belief (H3). Fourth, it was hypothesized that belief in political and medical conspiracies would be negatively correlated with political affiliation (i.e. more left-wing views; Hypothesis 4A) and tendencies to vote (i.e. fewer tendencies; Hypothesis 4B). More left-wing attitudes (i.e. democratic views) were predicted on the basis of greater questioning of official governance and more acceptances of alternative political positions. Fifth, the hypothesis was that belief in both conspiracy types would be positively correlated with belief in the effectiveness of alternative medicine (H5).

Method

Participants

In total, 323 participants (167 male, 156 female) and their age ranged from 18 to 75 (M=36.39, SD=16.17). The majority of participants identified as White (n=222), followed by Asian (n=88). In total, 164 participants identified as not religious, whilst the remaining 159 participants identified as being of some religious background. With regards to highest

educational qualification; no formal educational qualification (*n*=2), still in full-time education (*n*=29), high school certificate (*n*=52), undergraduate degree (*n*=140), postgraduate degree (*n*=81), and other qualification (*n*=19).

Materials

1. *CTs*: This consisted of 20 statements of conspiracy theories either chosen from previous conspiracy belief scales (i.e. Generic Conspiracist Beliefs Scale, Brotherton et al. 2013; Psychiatric Skepticism Scale, Swami, Persaud & Furnham, 2011). Half were political because they involved action by a government, and half were medical because they involved action by the medical or pharmaceutical industry.. The order of presentation of each statement was randomized for each participant. Examples of the political CTs were: A small, secret group of people is responsible for making all major world decisions, such as going to war.; Governments are spying on us through our computers and cell phones; Global warming is a hoax designed by governments in order to introduce higher taxation, controls on lifestyle and a more authoritarian government. Examples of the medical CTs were: Health officials know that vaccines cause illnesses but hide this from the public in order to increase pharmaceutical profits; The medical industry is withholding a cure for cancer in order to increase its profits. Experiments involving new drugs are routinely carried out on the public without their knowledge or consent.
2. *Self-esteem scale* (RSES; Rosenberg, 1965). RSES includes 10 items measuring self-worth. Higher scores indicate higher self-esteem and the RSES has been shown to have high internal consistency (Robinson & Shaver, 1973).
3. *Personality (*Gosling, Rentfrow & Swann, 2003) The TIPI includes 10 items that assess the Big Five personality factors. Participants were asked the extent to which a pair of traits applied to them and rated on a 7-point scale from 1 (disagree strongly) to 7 (agree strongly).

4. *Demographic, personality and attitude questions*. These included age, gender, highest education level, ethnicity, religious views (not at all to very), political views (i.e. more left or right wing) and opinions on the use of alternative medicine (i.e. how beneficial they believe its use to be). Political views were measured firstly by asking how often the participant tends to vote in elections, and secondly on a 10-point scale ranging from 1 (extremely left wing) to 10 (extremely right wing), with the option of selecting "no political views". Views on the effectiveness of alternative medicine were measured on a 5-point scale from 1 (not effective at all) to 5 (extremely effective), with higher scores indicating higher belief in the effectiveness of alternative medicine.

Procedure

Psychology Ethics Committee granted approval for this study and all participants gave informed consent. The task was an online questionnaire designed on Qualtrics. Participants completed the questionnaire online on either a computer or a smart phone device. It took approximately 10 minutes to complete.

Results

Descriptive statistics and bivariate Pearson correlations

Descriptive statistics (*M* and *SD*) and inter-correlations for all measures except gender and religion are shown in Table 1. Cronbach's alpha values for the 10 political and 10 medical conspiracy theories were both 0.90, demonstrating high internal consistencies for both belief measures (see Table 1 for Cronbach's alpha values for other measures). An average political and medical conspiracy belief score for each participant was therefore computed.

The correlations showed that belief in both political and medical conspiracy theories were significantly positively correlated with political attitudes (i.e. more right-wing views) and

the effectiveness of alternative medicine, and significantly negatively correlated with self-esteem, conscientiousness and age. These findings only fully support hypothesis 1B and hypothesis 5. In addition, only belief in political conspiracies was significantly negatively correlated with agreeableness and emotional stability, and only belief in medical conspiracies was positively correlated with education qualification (i.e. higher intelligence; see Table 1).

Additional analyses were conducted based on the summed belief score for each participant for all 20 conspiracies used, labelled 'overall conspiracy belief'. Overall conspiracy belief was significantly negatively correlated with self-esteem, Conscientiousness and age, and significantly positively correlated with political views (i.e. more right-wing), education qualification (i.e. higher intelligence) and belief in the effectiveness of alternative medicine (See Table 1). Previous studies have suggested a U-shaped relationship between political ideology and CTs and this was explored in the data set, by use of quadratic methods, but there was little evidence of a U shaped relationship.

Hierarchical regressions to predict political, medical and overall conspiracy belief

Three, three-stage hierarchical multiple regressions were conducted (all assumptions were met). For all analyses, demographic factors, namely gender, age, education and religious affiliation (dummy coded either religious or not religious), were entered at stage one. Personality factors (i.e. self-esteem, plus Big Five) were entered at stage two, and the remaining variables (voting tendencies, political views and beliefs about alternative medicine) were entered at stage three (see Table 2). Our aim was to investigate to what extent personality factors have incremental validity over demography, as well as to what extent political and medical beliefs accounted for more variance over demography and personality combined.

Insert Tables 1 and 2 here

The first hierarchical regression, predicting political conspiracy belief, revealed that at stage one, demographic factors contributed significantly to the regression model, $F(4,287) = 21.67$, $p < .001$, and accounted for 23.2% (adjusted $R^2 = 22.1\%$) of the variance in belief. Introducing personality factors explained an additional 4% of the variation in the belief in political conspiracy theories and this change in R^2 was significant, $F(6,281) = 2.58$, $p = .019$. Adding the remaining variables to the model explained an additional 12.5% of the variation in the belief in political conspiracy theories and this change in R^2 was also significant, $F(3,278) = 19.19$, $p < .001$.

Gender, age, religiousness, emotional stability, political views and belief in the effectiveness of alternative medicine were significant predictors of the belief in political conspiracy theories With regards to gender, males (M=2.86, SD=1.01) were more likely than females (M=2.38, SD=0.71) to believe in political conspiracy theories. Also, religious participants (M=2.89, SD=0.10) were more likely than non-religious participants (M=2.38, SD=0.74) to believe in political conspiracy theories. These variables accounted for 39.7% (adjusted $R^2 = 36.9\%$) of the variance in the belief in political conspiracy theories. Interestingly the only personality variable that was significant was (low) Neuroticism.

Regarding the second regression, demographic factors accounted for 20.4% (adjusted $R^2 = 19.3\%$) of the variation in the belief in medical conspiracy theories, and made a significant contribution to the regression model, $F(4,287) = 18.43$, $p < .001$. Adding personality factors explained an additional 1.4% of the variance, yet this change in R^2 was not significant, $F(3,278) = 0.82$, $p = .554$. Introducing the final variables to the model explained an additional 18.4% of the variance and this change was significant, $F(3,278) = 28.53$, $p < .001$.

Again gender, age, religiousness and belief in the effectiveness of alternative medicine were significant predictors of the belief in medical conspiracy theories. As with the results of the first regression, males (M=2.90, SD=0.99) were more likely than females (M=2.49,

SD=0.74) and those who were religious (*M*=2.97, *SD*=0.98) were more likely than those who were non-religious (*M*=2.44, *SD*=0.72) to believe in medical conspiracy theories. This supports the third hypothesis that religion would predict belief in both conspiracy theory types. The variables accounted for 40.2% (adjusted R^2 = 37.4%) of the variance in the belief in medical conspiracy theories.

In the third regression predicting overall conspiracy belief, stage one revealed that demographic factors accounted for 24.1% (adjusted R^2 = 23.1%) of the variation in belief, and this significantly contributed to the regression model, $F(4,287) = 22.83$, $p < .001$. The addition of personality factors at stage two explained a further 2.6% of the variation in overall conspiracy belief, yet this change was not significant, $F(6,281) = 1.67$, $p = .129$. Including the final variables at stage three was a significant change, $F(3,278) = 25.56$, $p < .001$, explaining an additional 15.8% of the variance in the model.

Gender, age, religiousness and belief in the effectiveness of alternative medicine were significant predictors of overall conspiracy belief. Just as with the results of the first and second regression analyses, males (*M*=2.89, *SD*=0.95) were more likely than females (*M*=2.45, *SD*=0.68), and religious participants (*M*=2.94, *SD*=0.95) were more likely than non-religious participants (*M*=2.42, *SD*=0.69) to believe in conspiracies. All variables together accounted for 42.6% (adjusted R^2 = 39.9%) of the variance in overall conspiracy belief.

Discussion

The results demonstrated strong support for a monological conspiracy belief system: belief in one conspiracy theory leads to belief in another conspiracy theory (Swami et al. 2011; Wood et al. 2012). The regression analyses showed that demographic factors, personality factors and attitude factors significantly contributed to the variance in belief in political

conspiracy theories. In contrast, personality factors did not significantly contribute to the variance in belief in medical conspiracy theories.

Personality factors

Self-esteem was negatively correlated with belief in both political and medical conspiracies, supporting hypothesis 1B, however it was not a significant predictor of belief in either conspiracy type. This is in keeping with previous findings (Goertzel, 1994; Swami et al. 2011).

On the other hand, Agreeableness was only negatively correlated with belief in political conspiracy theories but not belief in medical conspiracy theories, rejecting hypothesis 1A. It was expected that low agreeableness would be associated with belief due to increased antagonism and suspiciousness. It may be that agreeable people are more sympathetic to human error in medical situations

In contrast to hypothesis 1C and previous research, openness to experience was not associated with belief in either conspiracy theory type. An interesting and unexpected finding that extends previous work was that Conscientiousness and Emotional Stability appeared to be related to conspiracy belief. However, in the regression analyses, Conscientiousness was not a significant predictor of belief. Emotional stability, on the other hand, was negatively correlated with and significantly predictive of belief in political conspiracy theories, yet was not associated with belief in medical conspiracy theories. An association with emotional stability was unexpected because previous research had not suggested a link. Nevertheless, this finding is perhaps not surprising considering that neurotic individuals are more likely to interpret events as threatening (Thompson, 2008), which links to Hofstadter's (1971) traditional assumption that conspiracy theorists are paranoid and delusional.

Demographic factors

There was no relationship between education level and belief in political conspiracies, which contrasts with previous work by Swami et al. (2011) and research suggesting that cognitive biases account for individuals with lower intelligence adopting conspiracist beliefs (Douglas et al. 2016; Swami & Furnham, 2014). Higher education level was significantly correlated with greater belief in medical conspiracies, which is in line with findings that college-educated men tend to support AIDS conspiracy theories (Klonoff & Landrine, 1999) and was also significantly correlated with overall conspiracy belief. However, education was not a significant predictor of medical or overall conspiracy belief and the correlations were very small, suggesting that this link may be attributed to other factors. This may be associated with the measure used to assess intelligence. The sample used may also be restrictive. For instance, only two participants had no education qualifications and the majority held an undergraduate or postgraduate degree, reducing the generalisability of this finding.

Being religious was a strong predictor of belief in both types of conspiracy. This supports previous research, and can similarly be explained by a greater tendency to be superstitious (Barrett, 2007; Darwin et al. 2011; Stieger et al. 2013). Religious belief usually involves the belief in an all-powerful being, and this can be mirrored in conspiracist belief, as it involves believing that someone, or a group, is governing events that the individual has no control over. Religiousness may also be linked to conspiracy belief because these individuals may be less reliant on evidentiary processes. For instance, in Lobato et al.'s (2014) study, religiousness predicted pseudoscience belief, and was representative of the rejection of specific scientific concepts. It is unclear whether belief in different religions would lead to different findings.

The finding that younger people were more likely to support conspiracy theories could be because they are more likely to be exposed to them. For example, previous research suggests that media coverage is associated with greater conspiracist ideation (Kim & Cao, 2016), and

younger people could be exposed to more media messages through social media because older individuals are less likely to use social networking sites than young adults (Perrin, 2015). Alternatively, several of the conspiracy statements used involved events that occurred prior to the birth of some participants. Consequently, older participants may have heard these conspiracies when they originated, and so have had more time to consider their truthfulness than younger participants.

With regards to gender, males were more likely to believe both conspiracy types than females. This may be attributed to males being more likely to report themselves as open to new ideas than females (Costa, Terracciano & McCrae, 2001). As a result, men may be more likely to consider and accept conspiracies than women.

Attitude factors

The findings of this study also showed that there was no association between participants' tendencies to vote and their belief in political or medical conspiracies. This is in contrast to hypothesis 4B and research suggesting that conspiracy belief predicts lower political engagement (Jolley & Douglas, 2014a). However, this may be related to the conspiracy theories used. For instance, some of the conspiracies may be too dated to have an impact on trust in the current political government, or conspiracies regarding the US government may not lead British participants to mistrust the British government.

However, in contrast to previous research and hypothesis 4A, more right-wing political views were significantly correlated with greater belief in both political and medical conspiracy theories, yet this was only predictive of belief in political. Left-wing views were expected as democratic principles have been argued to involve greater questioning of the government and

acceptance of alternative methods (e.g. Swami et al. 2011; Swami & Furnham, 2014), yet it is unclear why right-wing views would be associated with greater conspiracist belief.

Hypothesis 5 regarding alternative medicine was however supported: greater belief in the effectiveness of alternative medicine was correlated with greater belief in both medical and political conspiracies. This was expected on the basis of such individuals potentially being more powerless and seeking control over their medical decisions. This is particularly plausible considering research suggesting that belief in alternative medicine is linked to spirituality (Astin, 1998), and so these individuals may similarly attribute events to something beyond what it is. Because an association was not only demonstrated with medical conspiracy belief, a general suspiciousness of all authorities and industries may explain this link. Consequently, a general worldview, as outlined by the monological belief system, appears an explanation for conspiracist belief regardless of the type of conspiracy.

The main limitation of this study, as with other studies of individual difference factors and conspiracist beliefs, is that the associations discussed here are correlational, and so causation cannot be inferred. Additionally, there are many individual difference factors that were not considered in this study (e.g. political cynicism, attitudes to authority, satisfaction with life). This is highlighted by the fact that only approximately 40% of the variance in belief in political and belief in medical conspiracies was accounted for when all factors were included in the model. It would also have been advantageous to have had a larger sample. Next, a number of variables were measured by single items (religious view, attitudes to alternative medicine) and it would be better to have a more robust, multi-item measure. Nevertheless we believe the study makes a contribution to the every growing literature on the psychology of conspiracy (and cover up) theories (Swami et al., 2017).

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Table 1. Descriptive statistics, Cronbach's alpha coefficients and bivariate Pearson

	M	*SD*	*N*	α	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Political CT belief	2.63	0.91	323	.90	**.85****	**.97****	**-.21****	**-.02**	**-.17****	**-.19****	**-.14***	**-.09**	**.21****	**-.28****	**.10**	**.39****	**.10**
2. Medical CT belief	2.70	0.90	323	.90		**.95****	**-.18****	**-.05**	**-.09**	**-.15****	**-.06**	**-.06**	**.18****	**-.21****	**.03**	**.48****	**.13***
3. Overall CT belief	2.68	0.86	323	.94			**-.21****	**-.03**	**-.14***	**-.18****	**-.11**	**-.08**	**.20****	**-.26****	**.07**	**.45****	**.12***
4. RSES	30.59	5.04	323	.83				.34**	.19**	.45**	.42**	.37**	-.08	.24**	-.06	-.04	.06
5. Extraversion	4.36	1.36	322	.50					.01	.09	.15**	.28**	.01	.20**	-.08	.05	-.02
6. Agreeableness	4.77	1.14	322	.32						.12*	.19**	.12*	-.12*	.18**	.00	.08	.04
7. Conscientiousness	5.15	1.25	322	.32							.26**	.16**	.11	.19**	-.09	.03	.01
8. Emotional Stability	4.66	1.31	322	.48								.21**	-.04	.12*	-.09	.01	.04
9. Openness	4.82	1.17	322	.24									-.22**	-.03	-.03	.00	-.07
10. Political views	4.72	2.44	311	-										.08	-.08	.14*	-.04
11. Age	36.39	16.17	323	-											-.17**	.00	.07
12. Voting tendencies	1.26	0.54	323	-												.03	-.03
13. AltMed	3.00	1.12	323	-													.11
14. Education	3.81	1.04	304	-													-

Note: ** p<0.01 level . *. P<0.05 level CT = Conspiracy Theory; RSES = Rosenberg's Self Esteem Scale; AltMed = Belief in the Effectiveness of Alternative Medicine

Table 2. Summary of hierarchical regression analyses for variables predicting political, medical and overall conspiracy belief.

Stage	Variables	Political conspiracy belief						Medical conspiracy belief						Overall conspiracy belief					
		β	*t*	*p*	*R*	R^2	ΔR^2	β	*t*	*p*	*R*	R^2	ΔR^2	β	*t*	*p*	*R*	R^2	ΔR^2
1					.48	.23	.23				.45	.20	.20				.49	.24	.24
	Gender	-.23	-4.36	<.001				-.21	-3.83	<.001				-.23	-4.37	<.001			
	Age	-.26	-4.91	<.001				-.22	-4.03	<.001				-.26	-4.88	<.001			
	Education	.04	0.69	.488				.07	1.22	.223				.05	0.99	.323			
	Religious	.31	5.86	<.001				.31	5.77	<.001				.33	6.17	<.001			
2					.52	.27	.04				.47	.22	.01				.52	.27	.03
	Gender	-.23	-3.96	<.001				-.20	-3.47	.001				-.23	-3.94	<.001			
	Age	-.23	-4.09	<.001				-.18	-3.17	.002				-.22	-3.99	<.001			
	Education	.05	0.89	.377				.07	1.35	.177				.06	1.16	.246			
	Religious	.32	5.90	<.001				.32	5.76	<.001				.33	6.18	<.001			
	Extraversion	.06	1.01	.315				-.02	-0.33	.742				.02	0.41	.686			
	Agreeableness	-.09	-1.57	.117				-.03	-0.51	.611				-.07	-1.20	.230			
	Conscientiousness	-.06	-1.11	.266				-.05	-0.82	.416				-.06	-1.00	.319			
	Emotional Stability	-.12	-2.07	.040				-.05	-0.76	.449				-.09	-1.53	.127			
	Openness	.02	0.35	.727				.06	0.97	.332				.04	0.68	.499			
	Self-Esteem	-.04	-0.56	.575				-.06	-0.80	.423				-.05	-0.69	.488			
3					.63	.40	.13				.63	.40	.18				.65	.43	.16
	Gender	-.22	-4.18	<.001				-.21	-3.98	<.001				-.23	-4.38	<.001			
	Age	-.20	-3.80	<.001				-.15	-2.92	.004				-.19	-3.74	<.001			
	Education	.03	0.68	.496				.05	0.99	.324				.04	0.87	.387			
	Religious	.21	4.19	<.001				.20	3.88	<.001				.22	4.37	<.001			
	Extraversion	.03	0.65	.519				-.05	-0.92	.358				-.003	-0.06	.952			
	Agreeableness	-.09	-1.80	.073				-.04	-0.71	.476				-.07	-1.48	.140			
	Conscientiousness	-.09	-1.62	.106				-.07	-1.31	.191				-.08	-1.51	.132			
	Emotional Stability	-.13	-2.36	.019				-.06	-1.03	.305				-.10	-1.86	.064			
	Openness	.04	0.66	.511				.06	1.11	.268				.05	0.90	.370			
	Self-Esteem	-.001	-0.02	.981				-.01	-0.16	.870				-.01	-0.09	.929			
	Voting tendencies	.03	0.64	.524				-.03	-0.67	.502				.01	0.12	.905			
	Political views	.12	2.26	.025				.08	1.51	.132				.09	1.90	.059			
	Alternative medicine	.34	6.91	<.001				.43	8.87	<.001				.40	8.27	<.001			