The Mini-IPIP6: Validation and extension of a short measure of the Big-Six factors of personality in New Zealand

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This study extends the Mini-IPIP, a short measure of the Big-Five personality dimensions, to a Big-Six model of personality structure based on the HEXACO. Exploratory and Confirmatory analyses of a representative New Zealand sample (N = 5,562) validated the original Mini-IPIP five-factor structure, and supported an extended six-factor model also indexing Honesty-Humility. The Mini-IPIP6 reliably predicted variation in hours spent performing activities relating to aspects of personality (e.g., socializing, voluntary/charitable work, housework, and computer games). The Mini-IPIP6 also differentially predicted criterion outcomes such as religious affiliation and identification, political orientation, beliefs about climate change, and willingness to make personal sacrifices for the environment. The 24-item Mini-IPIP6 (four items indexing each personality dimension) fills a niche where brief markers of the Big-Six dimensions of personality are desired. A regression equation demonstrating how to integrate parameters derived using representative New Zealand data with a given individual's Mini-IPIP6 scores to estimate his or her predicted value for each criterion outcome is provided (e.g., predicted housework in a given week), along with a copy of the scale itself, coding instructions and norms. This study represents the most detailed validation of a reliable and comprehensive broad-bandwidth public domain personality inventory for use in New Zealand to date.

The study of personality, or "relatively enduring styles of thinking, feeling, and acting" (McCrae & Costa, 1997, p. 509) dates back to the early 1900s (see Goldberg 1981, 1990, 1993; for discussion). Indeed, literally thousands of studies have been conducted assessing individuals' self-ascribed personality characteristics (e.g., Allport, 1937; Cattell, 1956; Costa & McCrae, 1992; Eysenck & Eysenck, 1975). More recently, however, order has been applied to this potential chaos, with the development of a general consensus that there seem to be five or possibly six distinct broad-bandwidth dimensions of personality that capture much of the variation or difference across people in their thoughts, feelings and behaviours. These five broad-bandwidth dimensions

of personality were synthesized and organized into a general framework by Goldberg (1981) who coined the term the "Big-Five" (see also Goldberg, 1990).

The emergence of unifying frameworks such as the Big-Five has helped dramatically to systematize and clarify personality measurement. The Big-Five refer to five relatively independent broad-bandwidth dimensions of personality that have been consistently and independently identified using multiple measurement methods (see Costa & McCrae, 1992; John & Srivastava, 1999; Goldberg, 1999). These dimensions are often referred to as: Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience. More recently, a sixth independent dimension of personality has also been identified, leading to the development of a Big-Six model of personality structure that extends the Big-Five by adding a personality dimension referred to as Honesty-Humility. This Big-Six model was proposed by Ashton and Lee (2007, 2009) and is referred to as the HEXACO.

Many of the most popularly used broad-bandwidth personality scales are proprietary instruments. Perhaps the most well known and widely used of such personality inventories is the proprietary NEO-PI-R measure of the Big-Five (Costa & McCrae, 1992). Access to such instruments, and the ability to tinker with scales, adapt measures to local contexts, or freely compare normative data and alternative methods of scale construction are thus limited compared to those instruments in the public domain. In something of a call to arms for personality researchers, Goldberg (1999, p. 7) discussed these issues in detail and issued, as he coined it, a 'plea for help' in "changing the way we construct new measures of personality characteristics." The thrust of Goldberg's (1999) appeal was that as a field, we need to develop, and continually refine and revise, a freely available personality inventory based on a standard item format and framework for organizing and measuring personality traits (see also Goldberg et al., 2006). Goldberg (1999) spearheaded this charge with the development of the International Personality Item Pool (or IPIP). The IPIP is an online and entirely

public domain set of personality items sharing a common format, which can be freely used to index any aspect of personality one can envisage.

Here, we aim to contribute to this effort by validating one specific IPIP measure for use in the New Zealand context. We also extend this IPIP instrument to include a sixth dimension of personality, which we argue can act as a marker for Honesty-Humility, the sixth broad-bandwidth dimension of personality identified by Ashton and Lee (2007). We provide comprehensive psychometric analyses that examine the internal validity and factor structure of the measure, which we term the Mini-IPIP6. We call this measure the 'Mini-IPIP6' to reflect the fact that it incorporates the five-factor Mini-IPIP previously developed by Donnellan, Frederick, Oswald, and Lucas (2006); but extends the measure to also include Honesty-Humility. We capitalize on data from the large-scale and nationally representative New Zealand Attitudes and Values Study (NZAVS) to validate the Mini-IPIP6 against a range of different criterion outcomes. Finally, we provide normative data for the Mini-IPIP6 using scores for men and women, of different ages, and for different ethnic groups in New Zealand. As far as we are aware, this is the most extensive formal validation of a broad-bandwidth multifactorial personality measure conducted in the New Zealand context to date.

In the following pages, we first provide an overview of current theory regarding what personality actually is, and why as a species we reliably differ in our levels of the traits that make up the Big-Six model of personality structure (after all, if Openness was always adaptive, shouldn't we all be high in it?). We proceed to outline recommendations for the use of the many excellent publicly available personality inventories, and introduce the Mini-IPIP6 scale and describe when and where this measure may be most useful. Finally, we outline our theoretical rationale for tests of the convergent and discriminant validity of the Mini-IPIP6 scales based on formal construct definitions of the different dimensions of personality indexed by the scale.

Personality as an explanatory model: An evolutionary genetic perspective

Personality is often invoked as an explanatory construct for other related behaviours and attitudes (see for e.g., Duckitt, 2001; Sibley & Duckitt, 2008; Sibley & Liu, 2010, for just a few of the many examples). There is, however, an inherent risk of tautology in many theories that invoke personality as a causal explanation for subsequent trait-like behaviour and attitudes. This arises in cases where dimensions of personality are (a) defined as aggregated summaries of behaviour and then (b) invoked as a causal explanation for similar but more specific behaviours and attitudes. Take, for example, the well-documented association between Conscientiousness and certain aspects of job performance (Dudley, Orvis, Lebiecki, & Cortina, 2006). Taken to the extreme, the explanation for this link would be tautological if one were, for example, to generate something like the following (inductive) line of reasoning: 'high Conscientiousness is indicative of traits such as *planning ahead*, *sticking to* routine, and paying continued attention to tasks; these traits in turn predict job performance because performance in a variety of jobs is determined in large part by aspects of the job that rely on being able follow a complex schedule, keep routines in place from day to day, and pay attention to detail.' Explanations of this type, however eloquent, are unsatisfying because they do not explain the prediction of outcomes based on any sort of explanatory theory of what personality actually is; or more specifically, (a) why it is that we see variation in certain underlying types of behaviour but not others, (b) and why such variation should causally affect or produce change in some outcomes but not others. One runs the very real risk of playing nothing more than a game of synonyms.

MacDonald's (1995, 1998) early work on the evolutionary basis of personality provided an elegant solution to this problem by offering an interpretation of personality as a behavioural system resulting from balanced evolutionary cost-benefit trade-offs (see also Buss, 1991). Nettle (2006) expanded upon this idea, and emphasized that variation in personality should occur when a higher level of a trait would have been adaptive in some environmental niches but not others. Nettle (2006) summarized this concept of balanced trade-offs as follows:

> "...the key point is that if two levels of a trait have roughly equal fitness overall and if increasing the trait increases some component of fitness, then it must also decrease other components. Every benefit produced by increasing a trait must also produce a cost. If this is not the case, there is no trade-off, and natural selection is directional toward the higher value of the trait." (p. 623)

These latter types of invariant traits should therefore tend to reflect human universals, things which humans tend to share because they are crosssituationally adaptive, and thus do not reliably differentiate us as individuals. One likely candidate for such a universal is the Need to Belong (Baumeister & Leary, 1995); another would be the need to maintain optimal distinctiveness (Brewer, 1991). The Need to Belong should generally have increased the ability to survive, reproduce, and see one's offspring reach a point where they could fend for themselves without the immediate help of their parents. All normal functioning humans are therefore evolved to be inherently social, and thus because we all display fairly similar levels of this trait in absolute terms, it is not useful for describing individual variation within our species.

Elaborating upon this general perspective, Penke, Denissen, and Miller (2007) offered a refined definition of personality as *individual reaction norms of genotypes across environments*. It is also notable that this concept offers a definition of personality similar in many regards to Mischel and Shoda's (1995, 1999) behavioral systems perspective of personality as signatures of contingent "if... then..." patterns of responding:

> "In this way, individual reaction norms come much closer to the original personality trait

<i>Table 1.</i> Interpretation of each is taken from Table 3 of Ashto is taken from Table 3 of Ashto and Lee (2007) originally dev€	Mini-IPIP6 factor, including examp 1 and Lee (2007, p. 156) with mino loped this framework for describin	le traits, and likely adaptive benefits ar r adaptations based on our interpretati g their HEXACO model of personality s	nd costs resulting from high levels of e on of Neuroticism and Agreeableness structure).	ach personality dimension. This table within a Big-Five framework. (Ashton
Factor	Interpretation	Example Traits	Likely adaptive benefits of high levels (in evolutionary history)	Likely costs of high level (in evolutionary history)
Extraversion	Engagement in social endeavours	Sociability, leadership, exhibition	Social gains (friends, mates, allies)	Energy and time; risks from social environment
Agreeableness	Ingroup co-operation and tolerance; reciprocal altruism in HEXACO model	Tolerance, forgiveness, (low) quarrelsomeness	Gains from cooperation, primarily with ingroup (mutual help and nonaggression)	Losses due to increased risk of exploitation in short-term exchanges
Conscientiousness	Engagement in task-related endeavours	Diligence, organization, attention to detail	Material gains (improved use of resources), reduced risk	Energy and time; risks from social environment
Neuroticism (Iow Emotional Stability)	Monitoring of inclusionary status and attachment relations; kin altruism in HEXACO model.	Anxiety, insecurity, (low) calmness	Maintenance of attachment relations; survival of kin in HEXACO model	Loss of potential gains associated with risks to attachment relations.
Openness to Experience	Engagement in ideas-related endeavours	Curiosity, imaginativeness, (low) need for cognitive closure and (low) need for certainty	Material and social gains (resulting from discover)	Energy and time; risks from social and natural environment
Honesty-Humility	Reciprocal altruism (fairness)	Fairness, sincerity, (low) entitlement and (low) narcissism	Gains from co-operation, (mutual help and non-aggression)	Loss of potential gains that would result from the exploitation of others (and in particular outgroup members)

definition by Allport (1937) as 'psychophysical systems that determine [an individual's] unique adjustment to his environments' (p. 48), than to the purely descriptive, empirically derived factors that are normally posited in personality psychology, and they also avoid the often-criticised circularity of the definition of traits as aggregated instances of behaviour; which are then used to predict...behaviour" (Penke et al., 2007, p. 572)

What, then, might the different cost-benefit trade-offs have been that produced systematic species-wide variation in the commonly-identified broad-bandwidth factors of personality? Nettle (2006) argued that individuals high in Openness may have benefited from increased creative tendencies, but also risked increased levels of psychosis. Writing at about the same time, Ashton and Lee (2007) offered an independent analysis of the possible costs and benefits of relative levels of the six dimensions of personality identified in their HEXACO model of personality structure.

A summary of the balanced selection pressures that should have produced variation in personality is presented in Table 1. This table is heavily based on that developed by Ashton and Lee (2007), with minor adaptations based on our interpretation of the costs and benefits of high levels of Agreeableness and Neuroticism within a Big-Five framework. Ashton and Lee (2007), for example, argued that a high level of Openness reflects individual-level variation in the tendency to expend energy pursuing rewards generated by novel ideas or ways of doing things. With regard to Neuroticism, we depart from Ashton and Lee's (2007) interpretation and instead view this dimension of personality as an index of individual reaction norms in the ease of activation of the attachment system and the related monitoring of inclusionary status, as suggested by sociometer theory (see Leary & Baumeister, 2000).

To give one example of the logic of defining personality as specieswide variation in behavioural systems resulting from balanced evolutionary pressures, Ashton and Lee (2007) argued that a high level of Openness should have been beneficial for our ancestors to the extent that it resulted in gains (due to discovery) for the individual and their group. However, a high level of Openness would also have caused the individual to expend time and energy, and increased exposure to risks from the social and natural environment. When risk and danger were low and there were novel gains to be had, people high in Openness should have prospered. However, when risk and danger were high and potential novel gains low, people low in Openness may have been relatively better off, evolutionarily speaking. Individual variation in this trait should therefore have been beneficial for us as a species because it increases our adaptability to environments with varying levels of danger versus untapped opportunity. This is most likely why we see variation in this trait across people.

Recommendations for the measurement of personality

How to best measure variation in these different individual reaction norms? There are a number of excellent publicly available measures of the Big-Five and Big-Six models of personality structure. These include (to name but a few), 50-item and 100-item instruments using the IPIP format (Goldberg, 1999), the 44-item Big Five Inventory (BFI; John & Srivastava, 1999), the 50item Five Individual Reaction Norms Inventory (FIRNI; Denissen & Penke, 2008), the 100-item Big Five Aspects Scale (BFAS; De Young, Quilty & Peterson, 2007), and the 60- and 100item HEXACO (Ashton & Lee, 2009).

The BFI, FIRNI, IPIP-50 and IPIP-100 all index the Big-Five dimensions of personality, Extraversion, Agreeableness, Conscientious, Neuroticism (or Emotional Stability) and Openness to Experience. The BFAS takes a more fine-grained approach adopting a wider range of IPIP items to index specific facets of each Big-Five dimension. The HEXACO-60 and HEXACO-100, in contrast, extend previous Big-Five models by including a sixth broad-bandwidth dimension representing Honesty-Humility. The HEXACO also locates some aspects of Big-Five Agreeableness as instead reflecting Honesty-Humility. Second, the HEXACO model of personality locates Agreeableness and Neuroticism (low Emotional Stability) as rotational variants of their Big-Five counterparts. These distinctions mean that Big-Five measures of Agreeableness and Neuroticism are not readily comparable to their HEXACO counterparts - thus one cannot simply take an existing Big-Five scale and add items also assessing Honesty-Humility. This can make comparisons between studies using HEXACO versus Big-Five scales problematic.

We, along with others, recommend the use of one of the many publicly available excellent and comprehensive full-scale measures of personality outlined above where possible. However, when time or questionnaire space is limited, short-form measures of personality with fewer items can provide a useful index of individual differences. Two such short-forms are the Ten Item Personality Inventory (TIPI; Gosling, Rentfrow, & Swann, 2003) and the 20-item Mini-IPIP (Donnellan, et al., 2006). These fill an important niche in research designs where personality is not the central research focus, but where there is space for an extremely short (the 10-item TIPI) or reasonably short (the 20-item Mini-IPIP) measure indexing broad-stroke individual differences in the basic dimensions of personality. These measures are by no means as reliable or accurate as fullscale measures, but they do reliably differentiate between the Big-Five dimensions of personality and show a reasonable level of predictive ability across various domains and outcomes (Gosling et al., 2003; Donnellan et al., 2006).

Overview and rationale for the Mini-IPIP6

The TIPI and the Mini-IPIP are both derived from a five-factor model of personality. Here we extend the Mini-IPIP short-form measure of Big-Five personality structure developed by Donnellan et al. (2006) by adding a sixth subscale indexing Honesty-Humility, consistent with the HEXACO model of personality structure. The Mini-IPIP6 aims to retain the measure of BigFive personality structure provided by Donnellean et al. (2006), but also include Honesty-Humility as a distinct additional dimension. This compromise fills an important niche where questionnaire space is limited and researchers want to *retain a short and well-validated measure of the Big-Five* (thus allowing valid comparison with previous research within a Big-Five framework) but also *index the sixth orthogonal personality dimension identified in the HEXACO model of personality structure.*

As marker items for Honesty-Humility we use two subtly reworded items from the original HEXACO Honesty-Humility scale developed by Ashton and Lee (2009), and two subtly reworded Narcissism items from the measure by Campbell, Bonacci, Shelton, Exline and Bushman (2004). Lee and Ashton (2005) demonstrated that Honesty-Humility reliably explains the majority of covariation between Narcissism and other similar constructs (Psychopathy and Machiavellianism), thus indicating that Honesty-Humility reflects a higher-order trait incorporating these more specific measures. Given this overlap, we opted to include items originally designed to measure Narcissism in our index of Honesty-Humility because of their brevity and match to the IPIP format.

The Mini-IPIP6 and the prediction of criterion outcomes

We assessed the convergent and discriminant validity of the Mini-IPIP6 by assessing how well each of the six personality scales predicted a range of criterion outcomes. These included selfreported time spent performing various activities and behaviours, political orientation, religious identification, belief that climate change is real, and willingness to make sacrifices to one's standard of living to help protect the environment. Tests of convergent validity assess, in essence, whether a given measure predicts key outcomes that it should theoretically predict, while one way to assess discriminant validity is to examine whether a given measure is distinct from other measures in predicting outcomes that it is not expected to relate to. To examine these properties of the Mini-IPIP6, we conducted multiple

regression analyses examining the unique concurrent association between each personality subscale, adjusting for the effects of the others, on a range of outcomes. We reasoned that if the Mini-IPIP subscales reliably assess different aspects of personality that fit the construct definitions presented in Table 1, then they should differentially predict key outcomes according to a range of diverse independent theories. We outline our rationale for why different dimensions of personality should predict these different outcomes below.

Personality and the prediction of daily routine

If different dimensions of personality are valid indicators of differences in regularities in behaviour, then they should reliably predict the time people spend doing different behaviours. To validate the scale, we thus examined how well the Mini-IPIP dimensions predicted (self-reported) time spent in the following activities in the last week: hours spent with friends, hours of charitable or voluntary work, hours of housework, and hours spent playing computer games.

We reasoned that if the Mini-IPIP6 measure of Extraversion reflects engagement in social endeavours, then this specific scale should predict hours spent with friends, and importantly, should be more predictive of this outcome than the other Mini-IPIP scales. We reasoned that if Honesty-Humility, in contrast, reflects reciprocal altruism (fairness) then it should predict hours of charitable or voluntary work. Given that such work tends to be social or group-based and often involves interacting with others, we also expected Extraversion to independently predict hours of charitable work. Importantly, Honesty-Humility should also be more predictive of hours of charitable work than Agreeableness, as we define the Mini-IPIP Agreeableness measure as an indicator of ingroup co-operation and tolerance, rather than a more general tendency toward reciprocal altruism that should also include outgroup members (as is the case with most charitable work).

We reasoned that if the Mini-IPIP measure of Conscientiousness indexes

engagement in task-related endeavours, then it should reliably predict hours spent doing housework. Importantly, while this effect may not necessarily be strong, it should be the strongest predictor out of all six Mini-IPIP6 scales. We also included a general measure of time spent playing all forms of computer game without differentiating between online and solo-play games or different gaming platforms. We reasoned that if playing computer games comes at the expense of other more normative task-related endeavours, then Conscientiousness should be negatively related to time spent playing computer games.

Personality and the prediction of political orientation

A substantial body of literature shows that measures of Openness consistently predict a more liberal political orientation. Carney, Jost, Gosling and Potter (2008), for example, examined the associations between personality and more general indices of liberal/left versus conservative/right political orientation, demonstrating that self-reported political orientation as liberal versus conservative was predicted primarily by low Openness and high Conscientiousness.

This is generally thought to occur because, following the definition presented in Table 1, an individuals' level of Openness should shape his or her tendency to chronically perceive environments as being more or less conducive to novelty and risk (Jost, Glaser, Kruglanski, & Sulloway 2003). Low Openness should thus predict political conservatism because people low in Openness should be more likely to identify with the existing social order as it provides a normative referent for existing social values and the way things should be. This should occur to the extent that people low in Openness value clear, unambiguous (and potentially inflexible) moral prescripts and rules describing how the world should and does operate. Such persons should therefore support the existing social order to the extent that it facilitates these values and provides an explicit and easily comprehensible set of norms and mores for operating within society (Duckitt & Sibley, 2009, 2010; Sibley &

Duckitt, in press). We thus expected that Openness would be the dimension of personality most strongly (negatively) associated with political conservatism.

Personality and the prediction of religious identification

A meta-analysis by Saroglou (2010) showed that Agreeableness was the Big-Five dimension of personality most strongly associated with religiosity. We examined whether this effect held when measuring personality with the Mini-IPIP6, using two outcome measures of religiosity. These were whether or not people affiliated with a religion or spiritual group, and for those who did, the self-reported psychological strength of their religious identification. In both cases, we expected that Agreeableness should be the personality dimension most strongly linked to religiosity. Saroglou (2010) argued that this link should occur because people high in Agreeableness should be likely to invest in shared social practices, adhere to social norms, and other related behaviours and values that facilitate ingroup function and cooperation. This is also consistent with the construct definition of Agreeableness as reflecting ingroup co-operation and tolerance presented in Table 1. Critically, this analysis provides a test of the distinction between the Mini-IPIP6 measures of Agreeableness and Honesty-Humility. If religiosity is more closely linked to adherence to ingroup norms and function, then it should be Agreeableness which most strongly predicts this dimension, not Honesty-Humility, which we argue relates to more general (outgroup focused) cooperation versus exploitation.

Personality and the prediction of environmental beliefs and behaviour

Research examining the links between personality and environmental attitudes and behaviours is reasonably scarce. In one of the few studies in this area, Hirsh (2010) reported that Openness and Agreeableness were the Big-Five dimensions most strongly associated with environmental concern. We extend Hirsh's (2010) research by assessing the extent to which the Mini-IPIP6 personality factors are linked to two aspects of environmental attitudes: the belief that climate change might be real and consequent willingness to act in ways that will help protect the environment, even at small costs to one's own standard of living.

We argue that if Openness reflects engagement in ideas-related endeavours (see Table 1) then it should cause people to be more accepting of the possibility that climate change really might happen. However, we argue that Honesty-Humility, not Openness or Agreeableness should be the dimension of personality most strongly related to willingness to act in ways that will help protect the environment at one's own expense. This distinction tests a core aspect of the discriminant validity of Openness and Honesty-Humility in terms of environmental attitudes and behaviours. If the construct definitions presented in Table 1 hold, then Openness should be linked to the cognitive and attitudinal recognition of the possible reality of climate change. Conversely, if Honesty-Humility reflects reciprocal altruism, then this should come through in commons dilemma-type situations, where people high in this trait should be more likely to act for the common good rather than maximizing self-interest (or ingroup interest) at the expense of other individuals or outgroups. If this holds, then Honesty-Humility should be the personality dimension most strongly predictive of behavioural intentions to do one's part in terms of helping to address or limit climate change, but it should not necessarily be linked with the cognitive recognition that climate change may be happening in the first place.

Method

Sampling procedure

The NZAVS-2009 questionnaire was posted to 40,500 participants from the 2009 NZ electoral roll. The publicly available version of the roll contained 2,986,546 registered voters. This represented all citizens over 18 years of age who were eligible to vote regardless of whether or not they chose to vote, barring people who had their contact details removed due to specific case-by-case concerns about privacy. In sum, roughly 1.36% of all people registered to vote in New Zealand were contacted and invited to participate. The NZAVS-2009 sampled a total of 6,518 participants. The overall response rate (adjusting for address accuracy of the electoral roll and including anonymous responses) was 16.6%.

Participant details

Complete responses to all 24 Mini-IPIP6 items were provided by 5,576 participants (85% of the sample; 3298 women, 2278 men). Of those providing complete data, 72% were New Zealand European (n=4,036), 16% of the sample were Māori (n=915), 4% were of Pacific Nations ancestry (n=222), 5% were of Asian ancestry (n=254), and 3% were coded as 'other' (n=149). Participants' mean age was 47.02 (SD =15.52).

Materials

The 24-item Mini-IPIP6 was administered using the following instructions: "This part of the questionnaire measures your personality. Please circle the number that best represents how accurately each statement describes you." Items were rated from 1 (very inaccurate) to 7 (very accurate). The Mini-IPIP6 contained the 20-items developed by Goldberg (1999) as part of the International Personality Item Pool and included by Donnellan et al. (2006) in the original Mini-IPIP. The Mini-IPIP6 also included four additional items used to index Honesty-Humility. Items H01 and H02 were adapted from the Narcissism scale developed by Campbell et al. (2004). Items H03 and H04 were adapted from Ashton and Lee's (2009) HEXACO measure of Honesty-Humility. Scale norms for New Zealand are presented in the Appendix. A copy of the Mini-IPIP6 is provided in Appendix B.

Participants rated their political orientation on a scale from 1 (extremely liberal) to 7 (extremely conservative). Religiosity was assessed by asking "Do you identify with a religion and/ or spiritual group?" For those who answered 'yes', religious identification was assessed using the question "How important is your religion to how you see yourself?" Responses were rated from 1 (not important) to 7 (very important).

Opinions about the reality of climate change were assessed using the item "Climate change is real." This item was rated from 1 (strongly disagree) to 7 (strongly agree). The willingness to make personal sacrifices to help protect the natural environment was assessed using the item from Liu and Sibley (in press): "Would/are you willing to make sacrifices in your standard of living (e.g., accept higher prices, drive less, and conserve energy) in order to protect the natural environment?" Scores ranged from 1 (definitely no) through 4 (maybe) to 7 (definitely yes).

Hours spent doing various activities were measured by asking participants to 'please estimate how many hours you spent doing each of the following things last week.'The activities analysed here were: 'volunteer/charity work', 'housework/cooking' and 'playing computer games.' Participants also recorded how many hours they spent with friends from each ethnic group in the previous week. The hours spent with friends from each ethnic group were summed to given an aggregate index.

Results

Factor Structure of the Mini-IPIP6

To evaluate the Mini-IPIP6 factor structure, the sample was randomly split into two equal halves (Ns = 2782). Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were conducted on these split samples. The correlation matrices for these two split samples are presented in Table 2. The pattern matrix for an EFA of the Mini-IPIP6 using Maximum Likelihood Estimation and applying an oblique rotation is presented in Table 3. This method of rotation allowed the different factors to correlate, rather than trying to force an orthogonal solution presuming that different dimensions of personality were entirely uncorrelated. This is based on our view that is seems sensible that the evolutionary pressures that created variation in certain sets of distinct behavioral regularities may have overlapped, such as the similar risk of increased losses due to exploitation (but in subtly different ways) resulting from a high level of both Agreeableness and Honesty-Humility (see Table 1). As shown, all items loaded most strongly on their hypothesized factor, and this six-factor model explained 55% of the variance (eigenvalues: 3.26, 2.97, 2.03, 1.96, 1.56, 1.35, 1.18, 0.88, 0.79,

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8. A	0412	2* .23	* .21*	18*	36*	.44	28*		00	03	.14	.11*	.10*	00	.05*	.05*	06*	.15*	.23*	.300*	.21*	.18*	12*	.11*
9. C	01 .02	2.08	.02	.05*	.16*	0 <u>.</u>	.12*	03		.37*	30*	36*	05*	<u>.</u> 01	00.	.05*	06*	.05*	.03	.06*	01	00	.06*	.05*
10. C	0206	3* .07	.10*	02	.12*	<u>.</u>	.11*	0 <u>.</u>	.41		27*	31*	<u>0</u> .	03	.06*	.05*	03	.10*	.04*	.08*	05*	06*	<u>.</u>	01
11. C	0302	2.04	* 08*	02	09*	.1*	04	.14	28*	25*		.39*	.23*	08*	18*	.12*	.07*	.12*	.12*	.07*	.13*	.10*	08*	09*
12. C	04 .00	0.02	.04*	.01	10*	*60.	06*	.13*	33*	29*	.37*		.11*	02	.08*	.05*	.07*	.04	.05*	.04*	.10*	.05*	05*	04*
13. N	01 .06	3* .03	.04*	03	02	.06*	.02	*60 [.]	04*	00	.24*	.11*		33*	.43*	.31*	.19*	.10*	<u>.</u> 04	.04*	.18*	.20*	14*	15*
14. N	02 .05	эо. *ę	*	.12*	.03	.04	<u>.</u> 0	.03	.06*	01		01	34*		33*	.30*	- 04* -	.02	.02	00	07*	06*	.05*	.07*
15. N	0301	101	.08*	06*	6	.02	.11*	.07*	.02	.08*	.21*	.06*	.46*	34*	·	.22*	.11*	.1*	.06*	.10*	.10*	.13*	10*	12*
16. N	04 .04	t* .01	01	.07*	00	.02	01	01	.05*	.02	07*	01	34*	.31*	20*	•	- 01 -	.03	01	.03	08*	14*	.05*	.04*
17. 0	01 .15	3*10	ı*12*	.13*	.07*	03	*60.	04	05*	00	.06*	.05*	.20*	04*	.08*	.07*	'	19*	.47*	26*	.11*	.06*	06*	09
18. O	0211	15 .15	.18*	08*	02	.20*	03	.19*	.06*	.11*	.16*	.10*	*60.	01	.15*	<u>6</u>	18*		.33*	.55*	.02	.03	03	03
19. O	0314	4* .16	.19*	13*	06*	.14	06*	.19*	.08	.08*	.12*	.08	<u>.</u>	<u>.</u> 0	.08*	.04*	42*	.33*		.35*	.06*	.07*	04*	04*
20. O	0411	1. 17	* .21*	13*	12*	.23*	10*	.31*	.05*	.10*	.10*	.07*	.02	02	.13*	04*	22*	.50*	.32*		.04	.04*	05*	05*
21. H	01 .16	3*01	04	.06*	10*	.10*	03	.14	01	02	.1*	.12*	.23*	07*	13*	.06*	.10*	.01	.03	<u>.</u> 01		.56*	37*	33*
22. H	02 .14	t* .01	01	.04*	06*	.12*	<u>.</u>	.15*	01	.02	.1*	.10*	.18*	07*	4	.11*	.07*	.02	.04*	.03	.56*		47*	41*
23. H	0315	90 [.] *6	.10*	09*	.06*	08*	.03	08*	.06*	01	07*	11*	12*	.02	12*	.05*	07* -	· 03*	6	05*	38*	51*		.60*
24. H	04 - 14	4* .05	;* .05*	05*	.04*	06*	0	07*	.03	04*	05*	08*	12*	.04	12*	.05*	08*	02	.03	05*	37*	45*	.60*	
* p < .0{																								

Table 2. Item correlation matrices used in the EFA (below diagonal) and CFA (above diagonal).

0.73).

Standardized loadings for the CFA conducted on the second split sample are presented in Figure 1. All items had standardized loadings of > .40 on their hypothesized latent factor. When evaluating model fit, Hu and Bentler (1999) suggested that reasonable models should have a standardized Root Mean Square Residual (sRMR) below .08 and a Root Mean Square Error of Approximation (RMSEA) below .06. These are of course rules-of-thumb. Fit indices for the hypothesized model were: $\chi^2(237; N = 2781) = 3772.94$, p < .01; sRMR = .057, RMSEA = .073, Model CAIC = 4335.57. The

chi-square test of model fit indicated that the hypothesized six-factor model fit the data significantly more poorly than a model with no constraints (in which every indicator freely loaded on every factor, and thus factors were not distinct). The hypothesized model did, however, approach a reasonable level of approximate fit, with the sRMR indicating that that the model would allow the correlation matrix to be reproduced with an average accuracy to within roughly .06 units.

An alternative Big-Five model in which the items assessing Agreeableness and Honesty-Humility loaded on a single latent factor was also evaluated. The fit indices for the alternative model were: $\chi^2(242; N = 2781) = 5767.91, p < .01;$ sRMR = .081, RMSEA = .091, Model CAIC = 6285.89. The hypothesized sixfactor solution provided a significantly better fit than this five-factor model $(\chi^2_{d,f}(5) = 1994.97, p < .01)$. A test of the original Big-Five model (excluding Honesty-Humility) provided fit indices comparable to those reported by Cooper, Smillie and Corr (2010) in their validation of the Mini-IPIP ($\chi^2(160; N = 2781) = 2888.10, p < .01;$ sRMR = .059, RMSEA = .078, Model CAIC = 3334.63).

Table 3. Results from a Maximum Likelihood Exploratory Factor Analysis with oblique rotation assessing the Mini-IPIP6.

		1	2	3	4	5	6
Extra	aversion						
E01	Am the life of the party.	10	.73	07	01	02	.02
E02	Don't talk a lot. (r)	.07	.54	.09	.03	.01	03
E03	Keep in the background. (r)	.04	.61	.13	.00	08	.01
E04	Talk to a lot of different people at parties.	.01	.67	11	08	.06	.01
Agre	eableness						
A01	Sympathize with others' feelings.	01	02	04	03	.77	.02
A02	Am not interested in other people's problems. (r)	.08	.03	.27	.01	.31	01
A03	Feel others' emotions.	06	03	04	.02	.70	.00
A04	Am not really interested in others. (r)	.09	.09	.27	04	.41	01
Cons	scientiousness						
C01	Get chores done right away.	.00	.05	14	.04	.05	.62
C02	Like order.	06	05	14	.10	.06	.59
C03	Make a mess of things. (r)	01	01	.20	18	05	.52
C04	Often forget to put things back in their proper place. (r)	.08	.01	.14	.03	05	.58
Neur	oticism (low Emotional Stability)						
N01	Have frequent mood swings.	02	.05	01	.73	03	01
N02	Am relaxed most of the time. (r)	.07	06	.10	.54	04	.03
N03	Get upset easily.	02	.01	15	.59	.09	.03
N04	Seldom feel blue. (r)	.00	07	.16	.46	03	.02
Oper	nness to Experience						
O01	Have a vivid imagination.	08	.11	.30	.24	.02	03
O02	Have difficulty understanding abstract ideas. (r)	06	06	.71	02	06	.01
O03	Do not have a good imagination. (r)	02	.07	.51	.07	02	.01
O04	Am not interested in abstract ideas. (r)	03	03	.69	.03	.07	03
Hone	esty-Humility						
H01	Feel entitled to more of everything. (r)	.58	02	04	09	.06	.01
H02	Deserve more things in life. (r)	.73	.05	03	03	01	01
H03	Would like to be seen driving around in a very expensive car. (r)	.76	05	.00	.09	02	.02
H04	Would get a lot of pleasure from owning expensive luxury goods. (r)	.73	.02	05	.06	04	02

Pattern matrix coefficients > .30 printed in bold. (r) reverse-scored item.





Discriminant and convergent validity of the Mini-IPIP6

Regression models were conducted examining the extent to which the Mini-IPIP6 scale differentially predicted a range of outcomes. All models controlled for gender and age. Table 4 reports analyses of the unique association between the Mini-IPIP6 dimensions and hours spent during the week with friends and performing charitable or voluntary work. For all tables, b refers to the unstandardized regression parameter, β refers to the standardized regression parameter, and r represents the bivariate association of each predictor with the dependent variable. For each model, the strongest standardized personality predictor of each outcome is printed in bold.

As can be seen in Tables 4 and 5,

different dimensions of personality were clearly associated with the number of hours people spent in different activities. As shown in Table 4, Extraversion was significantly associated with the number of hours spent with friends (b = 4.117, $\beta = .090, t = 5.99, p < .01$). Importantly for our analysis of discriminant validity, Extraversion was also the dimension of personality most strongly associated with hours spent with friends. As can also be seen in Table 4, Honesty-Humility was, as predicted, significantly uniquely associated with hours spent doing charitable or voluntary work (b $= .150, \beta = .034, t = 2.40, p < .05$). Also as predicted, Honesty-Humility was the dimension of personality most strongly associated with this criterion outcome.

Table 5 presents the results of models predicting the hours per week

people spent doing housework and playing computer games. As shown, Conscientiousness was the dimension of personality most predictive of the number of hours of housework people performed (b = .454, $\beta = .043$, t = 3.20, p < .01). Perhaps not surprisingly, adjusting for the effects of personality and age, the model also showed that women performed, on average, 5.963 more hours of housework per week than men (b = -5.963, $\beta = -.259$, t = 18.41, p < .01). Of course, there are many other factors not included in the model, such as employment status, relationship status, and the age of children, that may also contribute to the number of hours of housework that men and women perform.

Also consistent with predictions, Conscientiousness was the dimension

Table 4. Regression models predicting hours in the last week spent with friends and doing charitable or voluntary work.

		Hours s	pent with frie	ends	Hours	of charita	ble or volu	ntary work
	b	β	t	r	b	β	t	r
Constant	47.971				-2.211			
Gender (50 women, .50 men)	3.816	.036	2.35*	.020	079	008	53	006
Age	385	114	-7.41*	126	.038	.118	8.09	.114
Extraversion	4.117	.090	5.99*	.092	.150	.034	2.40*	.025
Agreeableness	671	013	80	020	.098	.019	1.28	.037
Conscientiousness	1.726	.035	2.43*	.009	065	014	-1.10	.006
Neuroticism	.809	.017	1.14	.032	.010	.002	.15	026
Openness to Experience	-2.343	050	-3.26*	010	.108	.024	1.65	.016
Honesty-Humility	-1.988	051	-3.35*	097	.124	.033	2.27*	.063

* p < .05. Model predicting hours with friends: R^2 =.03; F(8,4877)=18.82, p < .01. Model predicting hours of charitable work: R^2 =.02; F(8,5458)=12.11, p < .01. *r*-values are bivariate correlations with the dependent variable. The strongest standardized personality predictor(s) in each model are printed in bold.

Table 5. Regression models predicting hours in the last week spent doing housework and playing computer games.

		Hours	of housewo	rk	Hours	playing co	omputer ga	mes
	b	β	t	r	b	β	t	r
Constant	2.901				4.989			
Gender (50 women, .50 men)	-5.963	259	-18.41*	264	.138	.018	1.22	.034
Age	.059	.081	5.75*	.055	023	092	-6.39*	109
Extraversion	.053	.005	0.39	.013	138	041	-2.90*	032
Agreeableness	.159	.014	0.95	.100	179	045	-3.06*	068
Conscientiousness	.454	.043	3.20*	.082	315	086	-6.31*	110
Neuroticism	.238	.023	1.68	.036	.076	.022	1.54	.053
Openness to Experience	.101	.010	0.71	005	.098	.028	1.96*	.024
Honesty-Humility	.065	.008	0.55	.061	056	019	-1.34	061

* p < .05. Model predicting hours of housework: $R^2 = .08$; F(8,5485)=58.64, p < .01. Model predicting hours playing computer games: $R^2=.03$; F(8,5485)=19.42, p < .01. *r*-values are bivariate correlations with the dependent variable. The strongest standardized personality predictor(s) in each model are printed in bold.

Table 6. Regression model predic	ting politi	cal conservat	ism.	
		Political (Conservatism	
	b	β	t	r
Constant	4.524			
Gender (50 women, .50 men)	.050	.020	1.40	.023
Age	.003	.039	2.69*	.099
Extraversion	064	061	-4.25*	123
Agreeableness	032	026	-1.73	077
Conscientiousness	.109	.095	6.92*	.097
Neuroticism	011	010	-0.70	026
Openness to Experience	217	197	-13.72*	226
Honesty-Humility	.005	.006	0.40	.024

* p < .05. Model predicting political conservatism: R^2 =.07; F(8,5252) = 47.62, p < .01. *r*-values are bivariate correlations with the dependent variable. The strongest standardized personality predictor(s) in each model are printed in bold.

of personality most predictive of the number of hours per week that participants reported playing computer games (b = -.315, $\beta = -.086$, t = 6.31, p < .01). This effect was negative, indicating that people who scored higher on the Mini-IPIP6 Conscientiousness scale played fewer hours of computer games on average. As also shown in Table 5, when adjusting for the effects of personality and age, there was no significant difference between men and women in the hours of computer games they reported playing (b = .138, $\beta = .018$, t = 1.22, p = .22).

As shown in Table 6, and once again consistent with predictions, Openness to Experience was the dimension of personality most strongly (negatively) associated with political conservatism $(b = -.217, \beta = -.197, t = 13.72, p$ *Table 7*. Regression models predicting belief that climate change is real and willingness to make personal sacrifices for the environment.

	Beli	ef that clim	iate change	is real	V	Villingnes acrifices	s to make pe for environm	ersonal ent	
	b	β	t	r	b	β	t	r	
Constant	4.362				2.149				
Gender (50 women, .50 men)	229	067	-4.68*	092	176	053	-3.78*	104	
Age	006	053	-3.72*	085	.000	001	-0.10	.013	
Extraversion	047	033	-2.30*	.016	026	018	-1.32	.024	
Agreeableness	.109	.064	4.33*	.098	.205	.124	8.56*	.184	
Conscientiousness	.017	.011	0.80	.015	.021	.014	1.01	.050	
Neuroticism	.061	.040	2.86*	.061	002	001	-0.10	023	
Openness to Experience	.145	.097	6.75*	.112	.152	.104	7.40*	.130	
Honesty-Humility	024	019	-1.32	017	.165	.136	9.61*	.166	

* p < .05. Model predicting climate change beliefs: $R^2 = .03$; F(8,5560)=21.42, p < .01. Model predicting willingness to sacrifice for environment: $R^2=.07$; F(8,5512)=47.70, p < .01. *r*-values are bivariate correlations with the dependent variable. The strongest standardized personality predictor(s) in each model are printed in bold.

Table 8. Regression models predicting religious status and religious identification.

	Logistic ı status (0	regression =non-religi	predicting roous, 1=relig	eligious ious)	Line relig	ear regres jious iden	sion predicti tification	ing
	b	Exp(b)	χ²(Wald)	r	b	β	t	r
Constant	-2.276	.103	59.00*		 4.195			
Gender (50 women, .50 men)	210	.811	11.42	060	259	066	-3.13*	090
Age	.026	1.027	170.40*	.192	002	016	-0.74	001
Extraversion	.026	1.027	1.01	002	085	051	-2.40*	031
Agreeableness	.218	1.244	45.10*	.101	.144	.073	3.28*	.098
Conscientiousness	.022	1.022	0.64	.052	.053	.029	1.44	.052
Neuroticism	.004	1.004	0.02	027	045	025	-1.21	023
Openness to Experience	109	.897	15.85*	065	.030	.018	0.82	.029
Honesty-Humility	023	.977	1.06	.056	.041	.029	1.33	.064

* p < .05. Model predicting religious status: Cox & Snell R^2 =.05; $\chi^2(8,5442)$ =296.44, p < .01. Model predicting religious identification: R^2 =.02; F(8,2473)=6.06, p < .01. *r*-values are bivariate correlations with the dependent variable. The strongest personality predictor(s) in each model are printed in bold.

< .01). As can be seen in Table 7, Openness to Experience was also the personality dimension most strongly associated with the belief that climate change was real (b = .145, $\beta = .097$, t =6.75, p < .01). However, as predicted, Honesty-Humility was most predictive of willingness to make sacrifices to one's living standard in order to protect the environment ($b = .165, \beta = .134, t = 9.61$, p < .01). Openness to Experience was also significantly linked to willingness to make sacrifices for the environment $(b = .152, \beta = .104, t = 7.40, p < .01)$, but Honesty-Humility was not significantly associated with beliefs about the reality of climate change (b = .024, $\beta = -.019$, t = -1.32, p = .19).

Finally, models predicting participants' religious affiliation, and for those who were religious, the strength of their religious identification, are presented in Table 8. A logistic regression indicated that Agreeableness was the dimension of personality most strongly predictive of religious status $(b = .218, \operatorname{Exp}(b) = 1.244, \chi^2 = 45.10,$ p < .01). Consistent with expectations, this effect was independent of Honesty-Humility, which was not significantly predictive of religious affiliation (b =-.023, Exp(b) = .977, $\chi^2 = 1.06$, p = .30). Also as predicted, Agreeableness was also the dimension of personality most strongly associated with the strength of religious identification ($b = .144, \beta =$.073, t = 3.28, p < .01).

Discussion

The Mini-IPIP6 builds upon the original Mini-IPIP proposed by Donnellan et al. (2006) and extends this earlier measure to include a sixth dimension of personality indexing Honesty-Humility, while also retaining identical measures of the existing Big-Five factors. We show that the Mini-IPIP6 factor structure holds in the New Zealand context, and that the different dimensions of personality indexed by the Mini-IPIP scales show good convergent and discriminant validity across a range of outcomes.

Comparing the different Mini-IPIP6 scales, results indicated that as expected, Extraversion was the dimension of personality most predictive of time spent with friends, whereas Honesty-Humility was most predictive of the hours spent engaging in charity or voluntary work. Conscientiousness was the dimension of personality most predictive of hours of housework, and also (negatively) most predictive of the number of hours spent playing computer games. Analyses of other criterion outcomes also supported the convergent and discriminant validity of the Mini-IPIP6 in all cases. Consistent with previous research and theory, Openness to Experience was the dimension of personality most strongly (negatively) linked with political conservatism. As expected, Openness to Experience was also most strongly predictive of the recognition that climate change may be real. Honesty-Humility, in contrast, was as hypothesized, the dimension of personality most strongly predictive of willingness to make sacrifices to one's living standard to help protect the environment. We discuss the implications of this distinction between Openness and Honesty-Humility for the psychology of climate change belief versus behaviour in greater detail below. Finally, and also consistent with previous research and in line with the construct definitions outlined in Table 1, Agreeableness was the dimension of personality most predictive of religious affiliation and identification.

As far as we are aware this is the first formal large-scale validation of a reliable and valid publicly available measure of Big-Five or Big-Six personality in the New Zealand context. Although personality research may not appear to be an historical research strength in New Zealand, it should nevertheless be recognized that local researchers have contributed to our understanding of personality in a variety of areas. These include the investigation of personality 'types' such as narcissism and psychopathy (e.g., Bizumic & Duckitt, 2008; Wilson & McCarthy, 2011; Wilson & Sibley, 2011), the use of measures such as the Big Five in personnel selection (e.g., Black, 2000; Packman, Brown, Englert, Sisarich, & Bauer, 2005), the relationship between

personality and socio-political attitudes (e.g., Sibley, Harding, Perry, Asbrock & Duckitt, 2010; Sibley & Wilson, 2007) and assisting in the cross-cultural investigation of personality structure (e.g., Schmitt, Allik, McCrae, & Benet-Martinez, 2007). The Mini-IPIP6 goes beyond this previous research to present a validated six-factor scale canvassing the major dimensions of personality and showing that this measure is appropriate for use in the New Zealand context. The presentation of scale norms based on representative national data is also important, and we hope will provide a useful benchmark for other researchers examining personality in New Zealand in the future.

Our analysis of the discriminant and convergent validity of the Mini-IPIP6 personality factors also identified some interesting trends which warrant further investigation, both in New Zealand and more generally. For instance, our results provide novel information about how different aspects of personality relate differentially to the recognition of, versus willingness to act upon, information to help protect the environment at the expense of one's own standard of living. Our findings suggest that there is a critical distinction between aspects of personality that facilitate acceptance of the possibly threatening message that climate change is likely to be real, and consequent behavioural intentions to act in ways that help protect the environment at one's own expense. We show that a high level of Openness to Experience is related to an increased recognition that climate change is most likely real. However, Openness is not the strongest predictor of an increased willingness to change behaviour in order to address such concerns. Here, a high level of Honesty-Humility seems more important. These findings highlight the possibility that the relationship between personality and pro-environmental behaviour might fit a two-stage process model where a high level of Openness predicts initial recognition of the problem of climate change for humanity in general, and a high level of Honesty-Humility then predicts consequent willingness to change personal behaviour to help address the problem for the good of all.

To focus on another novel aspect of our results, this study is also one of the first to document comprehensive links between computer game use and personality. Only a small handful of studies have examined the links between personality and gaming behavior (e.g., Teng, 2008). Our research complements existing research on personality and computer game usage by documenting, for the first time, the links between the broad-bandwidth dimensions of personality and overall hours spent playing computer games in a large nationally representative sample. Our results indicate that people who play more regular hours of computer games are likely to be slightly less conscientious, which we argue likely occurs because playing computer games in the New Zealand context may come at the expense of other more normative task-related endeavours, in which people high in Conscientiousness should be likely to engage.

Our results further indicate that men and women played a similar number of overall hours of computer games in New Zealand. This finding seems to contradict some common stereotypes about men being more likely to play computer games. It may be, however, that men and women play quite different types of games, and on different gaming platforms. Our study did not, however, differentiate between the types of games people were playing, whether they were online or solo-players, or whether they were using a desktop computer or gaming console. Exploring these more fine-grained links between personality and specific gaming behaviour in different contexts may be a useful direction for research interested in how personality is linked to gaming.

Our results also complement previous research examining how personality relates to religious affiliation and identification. Consistent with the meta-analysis by Saroglou (2010), we found that Agreeableness was the dimension of personality most strongly predictive of (a) affiliating with a religious group or practice in the first place, and (b) the extent to which belonging to such a group was central to the individual's self-concept. This is consistent with the interpretation of Agreeableness as a behavioural system that regulates variation in ingroup co-operation and tolerance, because as Saroglou (2010) argued, people who are motivated to engage in ingroup co-operative endeavours and adhere to ingroup norms should be more likely to engage with (ingroup) religious practices as an expression of these. The study of religion and pro-sociality has received extensive attention (e.g., Norenzayan & Shariff, 2008). Our analyses highlight a critical distinction between Agreeableness and Honesty-Humility as two distinct indicators of pro-sociality in different domains and how they relate to religious identification and affiliation. People who were religious in New Zealand tended to be more agreeable, but no more or less honest or humble according to the Mini-IPIP measure of these constructs. This is also consistent with what we expected, given that Honesty-Humility should be indicative of variation in a behavioral system regulating reciprocal altruism at a more general level, beyond the bounds of specific ingroup memberships (such as religious group membership).

One feature that makes this study unique is that it is based on a representative sample of more than 5000 New Zealanders. As such, estimates of the links between the different Mini-IPIP scales and the various criterion outcomes we examined should be reasonably close to those that exist in the New Zealand population at the overall level. This makes the unstandardized regression parameters reported in Tables 4-8 extremely useful for generating predicted scores on outcome criteria for a given person that has completed the Mini-IPIP6. For example, using the unstandardized regression parameters reported in Table 5, we could specify an equation predicting how many hours of housework a given person (person i) is likely to perform as follows:

$\begin{array}{l} Predicted \ hours \ of \ weekly \\ housework \ for \ person_i = 2.901 + \\ (Gender_i * -5.963) + (Age_i * 059) + (E_i \\ * .053) + (A_i * .159) + (C_i * .454) + (N_i \\ * .238) + (O_i * .101) + (H_i * .065) \end{array}$

In this equation, *Gender*_i represents a contrast code where -.50 refers to female and .50 to male, Age_i represents the person's age in years, E_i represents the person's score on the Extraversion scale of the Mini-IPIP6, A, represents the person's score on the Agreeableness scale of the Mini-IPIP6, and so on for all six Mini-IPIP6 scales. Of course, the predicted score for any given person will be, on average, far from perfect. The key here is that it will be significantly better than chance (as the regression model was significant). Of course, this model could also be readily improved by incorporating other relevant factors, as is the case with any less than perfect predictive model (and no psychological model is perfect). Our point here is simply to provide a worked example of how the Mini-IPIP6 scale scores may be used to derive predictive models and provide some baseline parameters for the estimation of scores across a diverse range of outcomes.

Conclusion

To conclude, we present the Mini-IPIP6 as a viable short-form measure of the major broad-bandwidth dimensions of personality commonly identified in numerous proprietary and publicly available personality measures. These dimensions are: Extraversion, Agreeableness, Conscientiousness, Neuroticism, Openness to Experience and Honesty-Humility. Analyses of a large nationally-representative sample indicated that the Mini-IPIP6 has a reliable and replicable six-factor structure in the New Zealand context. We provide formal construct definitions for the six personality dimensions indexed by the scale, and show that the personality subscales indexed by the Mini-IPIP6 have excellent convergent and discriminant validity across a diverse range of criterion outcomes.

The Mini-IPIP6 fills a niche among other short-form instruments, such as the TIPI and original Mini-IPIP, where researchers want to retain indices of the original Big-Five but also index Honesty-Humility within a validated six-factor model. We hope that the Mini-IPIP6 scale, and the norms and other results we provide, will form a useful and accessible foundation for assessing personality in the New Zealand context. But more than that, we hope that the presentation of New Zealand data validating this IPIP-based measure of personality will contribute to the efforts of the international community of researchers engaged in the ongoing endeavour to develop and continually refine a comprehensive openly available and accessible method for the assessment of personality. Goldberg (1999) articulated this vision for the future of personality research in a seminal book chapter which outlined the research agenda for the International Personality Item Pool, and we think it worth repeating in closing here:

"I envisage an international effort to develop and continually refine a broad-bandwidth personality inventory, whose items are in the public domain, and whose scales can be used for both scientific and commercial purposes. No one investigator alone has access to many diverse criterion settings; but the international scientific community has such access, and by pooling our findings we should be able to devise instruments over the next decade that make our present ones seem like ancient relics." (p. 8)

Acknowledgements

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Appendix

Ethnicity	Gender	Age	z	Extrave	ersion	Agreea	bleness	Consci	entiousness	Neuro	ticism	Open	ness	Honest	/-Humility
				Σ	SD	Σ	SD	Σ	SD	Σ	SD	≥	SD	Σ	SD
NZ European	Women	18-25	229	4.42	1.24	5.57	0.85	4.87	1.23	3.86	1.08	5.10	1.02	4.71	1.25
		26-35	368	4.27	1.23	5.59	0.84	5.10	1.08	3.89	1.16	4.85	1.10	4.92	1.23
		36-45	500	4.13	1.23	5.54	0.88	5.24	1.08	3.68	1.08	4.90	1.10	5.11	1.28
		45-55	541	4.06	1.15	5.60	06.0	5.30	1.04	3.45	1.12	4.77	1.06	5.38	1.21
		55+	733	3.88	1.09	5.55	0.92	5.27	0.98	3.24	1.05	4.59	1.15	5.74	1.12
		Subtotal	2371	4.09	1.18	5.56	0.89	5.20	1.06	3.54	1.12	4.79	1.11	5.30	1.25
	Men	18-25	135	4.47	1.12	5.12	0.98	4.40	1.09	3.33	1.03	5.32	1.00	4.37	1.34
		26-35	177	3.96	1.21	4.84	1.05	4.81	1.11	3.31	1.14	5.23	1.12	4.65	1.34
		36-45	315	3.99	1.19	4.69	1.04	4.84	1.01	3.39	0.98	5.04	1.08	4.81	1.26
		45-55	382	3.90	1.15	4.90	1.00	5.03	0.95	3.30	1.16	4.80	1.17	4.97	1.32
		55+	640	3.88	1.08	5.03	0.91	5.13	1.06	3.08	1.01	4.54	1.10	5.37	1.23
		Subtotal	1649	3.96	1.14	4.92	0.99	4.96	1.06	3.23	1.06	4.83	1.14	5.01	1.32
	Overall		4020	4.04	1.17	5.30	0.98	5.10	1.07	3.42	1.11	4.81	1.12	5.18	1.29
Maori	Women	18-25	71	4.54	1.15	5.46	0.89	4.85	1.22	3.92	1.17	5.03	1.13	4.51	1.41
		26-35	105	4.35	1.11	5.30	0.95	5.37	1.07	3.65	1.01	4.82	1.01	4.84	1.42
		36-45	166	4.35	1.10	5.34	0.85	5.18	1.01	3.57	1.13	4.85	1.02	4.96	1.41
		45-55	125	4.13	1.05	5.44	06.0	5.29	0.95	3.51	1.09	4.71	1.16	5.15	1.37
		55+	98	4.01	1.19	5.39	0.92	5.34	1.05	3.27	0.98	4.58	1.03	5.32	1.27
		Subtotal	565	4.27	1.12	5.38	0.89	5.22	1.05	3.56	1.09	4.79	1.07	4.98	1.40
	Men	18-25	27	4.39	1.45	4.90	0.95	4.45	0.94	3.42	1.12	5.24	1.20	3.79	1.39
		26-35	48	4.39	1.20	5.04	1.23	4.70	1.31	3.03	1.03	5.29	1.05	4.33	1.44
		36-45	121	4.09	1.00	4.71	0.94	5.03	1.05	3.37	1.07	4.90	1.03	4.55	1.33
		45-55	75	3.70	1.10	4.94	0.81	5.02	0.93	3.59	1.06	4.57	1.07	4.67	1.28
		55+	72	3.80	1.01	4.88	06.0	5.13	0.96	3.07	0.89	4.49	1.01	5.00	1.29
		Subtotal	343	4.01	1.11	4.85	0.96	4.96	1.05	3.31	1.05	4.82	1.08	4.58	1.36
	Overall		908	4.17	1.13	5.18	0.95	5.12	1.06	3.47	1.08	4.80	1.07	4.83	1.40
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Ethnicity	Gender	Age	z	Extrav	ersion	Agree	ableness	Consci	entiousness	Neuro	ticism	Openne	ess	Honesty	Humility
				Σ	SD	Σ	SD	Σ	SD	Σ	SD	Σ	SD	Σ	SD
Pacific	Women	18-25	27	4.64	1.41	5.56	0.91	5.03	0.96	3.93	0.96	5.40	1.03	4.30	1.47
		26-35	32	4.08	1.01	5.09	0.95	4.83	0.99	3.96	0.96	4.73	1.24	4.29	1.22
		36-45	29	4.02	0.99	4.72	1.35	5.22	0.97	3.70	0.96	4.56	1.35	4.26	1.81
		45-55	26	3.99	1.10	5.18	1.07	5.01	1.08	3.06	1.19	4.64	1.10	4.75	1.56
		55+	10	4.68	0.68	5.70	1.02	5.65	0.71	3.13	1.17	4.35	1.32	4.13	1.88
		Subtotal	124	4.22	1.12	5.17	1.11	5.07	0.99	3.64	1.08	4.79	1.23	4.37	1.54
	Men	18-25	12	4.69	1.22	4.83	1.18	5.69	1.07	3.08	0.74	4.85	1.26	4.21	1.69
		26-35	19	4.32	1.18	4.89	0.88	4.45	1.41	3.24	0.88	4.83	0.98	4.09	1.48
		36-45	17	4.01	1.06	4.78	0.87	5.00	1.14	3.38	0.98	4.63	1.03	4.57	1.12
		45-55	32	3.92	1.04	4.95	0.81	4.92	1.18	3.44	0.87	4.70	0.94	4.32	1.37
		55+	18	3.92	1.14	4.89	0.70	4.60	0.86	3.83	0.79	4.33	0.69	3.96	0.99
		Subtotal	98	4.11	1.12	4.89	0.85	4.88	1.19	3.42	0.87	4.67	0.96	4.24	1.32
	Overall		222	4.17	1.12	5.05	1.01	4.98	1.09	3.54	1.00	4.73	1.12	4.31	1.45
Asian	Women	18-25	25	3.82	1.13	5.26	0.87	4.65	1.20	4.23	0.78	5.22	0.96	4.03	1.36
		26-35	40	4.04	1.26	4.96	0.98	5.23	1.00	3.70	1.04	5.16	1.06	4.01	1.51
		36-45	41	3.56	1.18	5.22	0.90	5.27	0.98	3.44	0.70	4.47	0.98	5.17	0.82
		45-55	29	3.72	1.14	5.25	0.86	5.72	1.07	3.57	0.86	4.53	1.16	4.82	1.33
		55+	18	4.13	1.16	5.11	0.77	5.71	0.77	3.18	0.85	4.88	1.18	5.07	1.11
		Subtotal	153	3.83	1.19	5.15	0.89	5.29	1.06	3.63	06.0	4.83	1.09	4.60	1.34
	Men	18-25	14	3.52	0.81	4.95	0.98	4.63	1.33	2.98	0.93	5.02	1.10	3.32	1.61
		26-35	18	3.72	1.14	4.71	1.19	4.39	0.72	3.92	0.62	4.86	0.94	4.01	1.30
		36-45	22	3.65	1.27	5.32	1.06	5.20	1.10	3.31	0.93	5.45	1.00	3.90	1.41
		45-55	26	3.75	1.35	4.99	1.14	5.45	0.97	3.69	1.21	4.85	0.90	4.32	1.09
		55+	21	3.58	1.41	4.80	1.22	5.19	1.08	2.86	0.98	4.74	1.32	4.56	1.19
		Subtotal	101	3.66	1.22	4.97	1.13	5.04	1.09	3.38	1.04	4.98	1.07	4.08	1.33
	Overall		254	3.76	1.20	5.08	0.99	5.19	1.08	3.53	0.96	4.89	1.08	4.40	1.36

Appendix B. The Mini-IPIP6.

l	Very Inaccurate ↓				Very Accurate ↓		
1. Am the life of the party.	1	2	3	4	5	6	7
2. Sympathize with others' feelings.	1	2	3	4	5	6	7
3. Get chores done right away.	1	2	3	4	5	6	7
4. Have frequent mood swings.	1	2	3	4	5	6	7
5. Have a vivid imagination.	1	2	3	4	5	6	7
6. Feel entitled to more of everything.	1	2	3	4	5	6	7
7. Don't talk a lot.	1	2	3	4	5	6	7
8. Am not interested in other people's problems.	1	2	3	4	5	6	7
9. Have difficulty understanding abstract ideas.	1	2	3	4	5	6	7
10. Like order.	1	2	3	4	5	6	7
11. Make a mess of things.	1	2	3	4	5	6	7
12. Deserve more things in life.	1	2	3	4	5	6	7
13. Do not have a good imagination.	1	2	3	4	5	6	7
14. Feel others' emotions.	1	2	3	4	5	6	7
15. Am relaxed most of the time.	1	2	3	4	5	6	7
16. Get upset easily.	1	2	3	4	5	6	7
17. Seldom feel blue.	1	2	3	4	5	6	7
18. Would like to be seen driving around in a very expensive car.	1	2	3	4	5	6	7
19. Keep in the background.	1	2	3	4	5	6	7
20. Am not really interested in others.	1	2	3	4	5	6	7
21. Am not interested in abstract ideas.	1	2	3	4	5	6	7
22. Often forget to put things back in their proper place.	1	2	3	4	5	6	7
23. Talk to a lot of different people at parties.	1	2	3	4	5	6	7
24. Would get a lot of pleasure from owning expensive luxury goods.	1	2	3	4	5	6	7

Instructions: This part of the questionnaire measures your personality. Please circle the

Scoring instructions. First, reverse code the following items: 6, 7, 8, 9, 11, 12, 13, 15, 17, 18, 19, 20, 21, 22, and 24. Next, create an average score for the four items assessing each dimension of personality. Extraversion: 1, 7, 19 and 23. Agreeableness: 2, 8, 14 and 20. Conscientiousness: 3, 10, 11 and 22. Neuroticism: 4, 15, 16 and 17. Openness to Experience: 5, 9, 13 and 21. Honesty-Humility: 6, 12, 18 and 24. An SPSS data entry template and scoring syntax is available from the first author upon request.