

Sex, Education and Procrastination: An Epidemiological Study of Procrastinators' Characteristics from a Global Sample

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Abstract

Procrastination is a common form of self-regulatory failure with substantive connections to lower levels of health, wealth and well-being. Conducting an epidemiological study, we determined the characteristics of prototypical procrastinators from a global sample based on several relevant self-reported demographic variables. Using an internet sampling strategy, we surveyed 16 413 English-speaking adults (58.3% women; 41.7% men; M age = 38.3 years, $SD = 14$), specifically on the variables of sex, age, marital status, family size, education, community location, and national origin. Almost all the results were statistically significant because of our large sample size. However, procrastination tendencies were most prominently associated with sex, age, marital status, education and nationality. Procrastinators tended to be young, single men with less education, residing in countries with lower levels of self-discipline. Notably, procrastination mediated the relationship between sex and education, providing further support that men are lagging behind women academically because of lower self-regulatory skills. Given procrastination's connection with a variety of societal ailments (e.g. excessive debt, delayed medical treatment), identifying risk factors and at risk populations should be helpful for directing preventative public policy. Copyright © 2012 John Wiley & Sons, Ltd.

Key words: procrastination; age; sex; education; demographics; nation

INTRODUCTION

Procrastination may be perceived as a form of self-regulatory failure, where we 'voluntarily delay an intended course of action despite expecting to be worse off for the delay' (Steel, 2007, p. 66). In short, we put off despite expecting to be worse off. Although it can be studied at a state or behavioural level, with the focus on individual acts of irrational delay, procrastination can be examined as a stable and enduring personality trait. In his meta-analytic and theoretical review on procrastination, Steel (2007) explicitly considered the evidence regarding procrastination as a personality trait, finding strong evidence for it. Test-retest reliabilities are .73 after an average of 42 days, 22% of the variation in the trait is associated with genetic factors, and it shows moderate to strong correlations with other personality traits, notably impulsiveness and conscientiousness (see also Dewitte & Lens, 2000). Impulsiveness is a somewhat narrower construct than procrastination, characterized by items such as 'It is hard for me to resist acting on my feelings' (Whiteside & Lynam, 2001). On the other hand, conscientiousness is a broader construct than procrastination, with overlapping facets such as impulse control and industriousness but also less representative facets such as morality, cautiousness and conformity. Firmly establishing it as individual difference variable, Steel (2011) later reviewed

the neurobiological basis of procrastination, highlighting the interplay between the limbic system and prefrontal cortex (see also Rabin, Fogel & Nutter-Upham, 2011).

Although references to procrastination have occurred throughout history, incidence rates have increased in recent years (Ferrari, Diaz-Morales, O'Callaghan, Diaz & Argumendo, 2007; Ferrari, O'Callaghan & Newbegin, 2005; Steel, 2007). Many people admit to procrastinating at least to some degree. When procrastination becomes extreme, however, people put off important actions associated with better health, wealth and well-being. A major problem in the medical arena, for instance, is that people put off seeing their doctors about their ailments, leaving them to worsen at times until treatment is no longer an option (e.g. Saposnik, 2009; Worthley et al., 2006). Similarly, of great concern in the financial arena is initiating personal retirement plans, with more than 80% of people by their own admission not saving nearly enough for their needs (Byrne, Blake, Cairns & Dowd, 2006; Venti, 2006).

In the present study, we conduct an epidemiological investigation of procrastination, determining the self-reported profile of the 'typical procrastinator'. Understanding the diagnostic indicators of procrastination identifies target populations and establishes where it is of most concern, a fundamental step for identifying risk factors and focusing preventative policy. Indeed, given the significant costs of procrastination, both Britain and the USA are exploring public policy changes to address procrastination (Cumming, 2008), and Peru has launched government programs to reduce *mañana* (lateness) (Joseph, 2007).

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We assessed six demographic indicators of procrastination, namely *sex*, *age*, *marital status*, *family size*, *education* and *community location*. In addition, we examined self-reported *nationality*. Previous research found these demographic variables as potential indicators of procrastination tendencies (Ferrari, Johnson & McCown, 1995; Ferrari, Dovosko & Joseph, 2005; Hammer & Ferrari, 2002; Harriott & Ferrari, 1996), but these studies used smaller sample sizes. We examined the demographic profile of a large, international sample of adult men and women assessing their self-reported procrastination tendencies through the use of a web-based survey.

To help determine the expected relationships, aside from the procrastination literature, there are other less direct traits to draw upon. Individual differences such as lack of persistence, low conscientiousness or high impulsiveness all have strong associations with procrastination (Ferrari et al., 1995; Schouwenburg, 2004; Steel, 2007). Consequently, we will also rely on these other similar constructs to inform the expected relationship that procrastination might have with our array of demographic variables.

Sex and age

The connection between sex and procrastination is well established. Men tend to have higher levels of impulsiveness (Strüber, Lück & Roth, 2008) and lower levels of self-control (Higgins & Tewksbury, 2006), both key determinants of procrastination. Directly, the relationship was explored by two particularly large-scale investigations—a survey study by Gröpel and Steel (2008) and a meta-analysis by Steel (2007). Sex correlated significantly with procrastination in these studies ($r = -.08$). Consequently, we strongly expect this relationship to be replicated here; men should procrastinate more.

Similarly well established is the relationship between age and procrastination tendencies. As we grow older and mature, we increase in conscientiousness (Roberts, Walton & Viechtbauer, 2006), a trait strongly associated with procrastination. This reflects our neurobiological development, as the young are still putting the finishing touches on their prefrontal cortices, compromising their ability for self-control (Jurado & Rosselli, 2007; Reyna & Farley, 2006). Finally, Steel (2007), on the basis of 16 studies, meta-analytically showed a strong negative relationship found between age and procrastination after correcting for range restriction. In the present study, we focused on replicating this connection.

Hypothesis 1a: *Men should procrastinate more than women.*

Hypothesis 1b: *Those younger should procrastinate more than those older.*

Marital status and family size

In terms of *marital status*, Moore (2004) suggested that 'procrastinators may postpone indefinitely love that tends toward legitimacy—not only marriage, but any relationship in which their actions count' (p. 649). Supporting this

position are Roberts, Kuncel, Shiner, Caspi, and Goldberg (2007), who found that the relationship between conscientiousness and divorce rate is $-.13$. Consequently, we expected procrastination to have a small but significant correlation with being divorced or separated and with being single. Also, a general survey (Steel, 2011) found that 24% of the population reported that procrastination has been a significant problem for romance (e.g. 'Procrastinating about asking someone out, about ending a relationship').

Related to marital status, we examined *family size*. Here, the results are less certain. On one hand, procrastination might manifest itself in terms of putting off having kids. On the other hand, procrastination may reflect putting off the use of effective birth control, a hypothesis other personality traits related to procrastination supports. Unplanned pregnancies or risky sexual behaviour is associated with a lack of conscientiousness and one other trait indicating procrastination, impulsiveness (Bouchard, 2005; Kahn, Kaplowitz, Goodman & Emans, 2002). Also, larger family sizes are associated with a lack of persistence (Jokela, Hintsala, Hintsanen & Keltikangas-Järvinen, 2010). Given these mixed findings, we make no hypotheses and instead seek to clarify family size's relationship with procrastination.

Hypothesis 2a: *Procrastinators are more likely to be single.*

Hypothesis 2b: *Procrastinators are more likely to be divorced or separated.*

Hypothesis 2c: *Procrastinators should be related to family size.*

Education

Incidence rates of procrastination among college students reach approximately 80% (O'Brien, 2002), with most of these students considering their procrastination as problematic (Day, Mensink & O'Sullivan, 2000; Onwuegbuzie, 2000). More recently, survey research indicates that one third of the general population considers procrastination in their educational endeavours a major problem (Steel, 2011). Their concern is well founded.

As Lubbers, Van Der Werf, Kuyper, and Hendriks (2010) reviewed, 'Conscientiousness, expressing a person's self-discipline, organization, and need for achievement, is the strongest personality predictor of academic performance, with a similar effect size as intelligence' (p. 203), noting later that conscientiousness is strongly related to procrastination. Using a large Dutch sample of nearly 10 000 students, Lubbers et al. found procrastination's negative relationship with academic math performance comparable in strength with that of conscientiousness. Supporting this connection, meta-analytic work by Steel (2007) provides a correlation of $-.19$ between academic performance and procrastination, similar in strength to the $.20$ to $.25$ correlation that conscientiousness has with academic performance (Nofhle & Robins, 2007;

O'Connor & Paunonen, 2007). It is not surprising, then, that Ferrari, Özer, and Demir (2009), using a sample of Turkish adults, found that those with higher levels of education report less procrastination. Putting your studies off until the last moment, past when you yourself believe you should start, is not a strategy for academic success or for graduation (Johnson, Green & Kluever, 2000)

Of additional interest, we investigated whether procrastination mediates education's relationship with sex. Presently, women earn the majority of University degrees and are far more likely to graduate (Goldin, Katz & Kuziemko, 2006; Heckman & LaFontaine, 2010; Janosz, Archambault, Morizot & Pagani, 2008). In 2009, for example, the US Census Bureau reported that 55% of people in the 18 to 29 year age group who earned a bachelor degree or higher are indeed women (U.S. Census Bureau, 2010). Personality has been suggested as a contributor to this finding. Specifically, Goldin et al. 2006 concluded 'One source of the persistent female advantage in K-12 school performance and the new female lead in college attainment is the higher incidence of behavioral problems (or lower level of noncognitive skills) among boys' (p. 153). Similarly, after investigating why in Belgian universities 'men are less successful than women and the difference are escalating in an alarming way' (p. 1), Masson, Cadot, and Ansseau (2003) settled on procrastination as one of the explanatory factors. This indicates that men's lesser ability to succeed academically is partially the result of their poorer self-regulatory skills, especially their propensity to procrastinate.

Hypothesis 3a: *Procrastinators should have less education.*

Hypothesis 3b: *Procrastination should mediate the relationship between sex and education.*

Community location

Procrastination should be associated with one's community location. Average personality scores do differ geographically. For example, Park and Peterson (2010) found that self-regulation skills differed among specific cities. Boston and New York are strong in creativity and critical thinking but lower in perseverance and self-regulation as compared with El Paso or Mesa. Two factors have been found to contribute to these differences. First, in a phenomenon known as selective migration, personality influences where people choose to live (Rentfrow, Gosling & Potter, 2008). Although most emphasis was placed on openness to experience as predicting urban living (Florida, 2009), low conscientiousness was associated with greater residential mobility with most people moving to or among urban locations (Oishi, 2010). Second, Kaplan and Berman (2010) noted that nature viewing typically replenishes self-regulatory capacity and that 'urban environments tend to be poor environments for restoring directed attention' (p. 48). Consequently, we expected that those adults residing in rural communities would show lower levels of procrastination than adults from more urban settings.

Hypothesis 4: *Procrastination should occur more in urban settings.*

Nationhood

Finally, in terms of *nationhood*, it is expected that some variation among the average levels of procrastination occurs, with citizens from some countries procrastinating more than other citizens. It has long been established that nations do vary on cultural dimensions, with Taras, Roney, and Steel (2009) noting in their review of cultural assessment, 'there may be a very fine line between culture and personality' (p. 359). Indeed, Taras et al. summarized results from a survey of culture experts, finding that the majority of them believe that 'Short-Term Orientation' is a cultural dimension, that is, where people seek immediate gains even at the cost of large future losses. Procrastination would be an example of such a short-term orientation (i.e. where we put off despite expecting to be worse off).

There has been one previous direct attempt to establish national rates of procrastination. As summarized by Ferrari et al. (2009), they did not find differences among nations. However, the methodology used was based on Ferrari's model of arousal and avoidance procrastination and 'to estimate the prevalence rates of pure procrastination types among adults of each country (to compare independently GP and AIP scores), we regressed GP [arousal procrastination] scores on AIP [avoidance procrastination] scores, and then vice versa, to obtain standardized z residual scores for the sole variance of the specific procrastination types' (Ferrari et al., 2007, p. 462). Unfortunately, as Steel (2010) meta-analytically summarized, the General Procrastination and Adult Inventory of Procrastination correlate together at .86, and along with factor analysis and other correlational as well as empirical evidence, 'there is no empirical support for this trinity of procrastination scales, especially regarding avoidant and arousal' (p. 931). Essentially, when you remove the common variance of two highly related procrastination measures, the unique residual is not procrastination but likely error.

A less direct attempt to measure procrastination comes from McCrae, Terracciano, and 79 Members of the Personality Profiles of Cultures Project (2005) with the Personality Profiles of Cultures Project based on the five-factor model. In particular, as Steel (2007) noted, 'the self-discipline scale, a facet of conscientiousness, contains several items strongly reminiscent of procrastination itself' (p. 67). Consequently, we expect our national procrastination averages to correlate with national self-discipline (McCrae, 2003; McCrae & Terracciano, 2008).

Our primary focus was to investigate whether such differences occur among English language nations, that is, America, Australia, Canada, India, Ireland, New Zealand, Philippines and the UK. However, because of our Internet sampling strategy, we also received data from non-English-speaking countries. Incorporating this supplementary data cannot be automatically justified as the exclusive use of English language scales for non-English countries can influence results (cf., Sperber, Devellis & Boehlecke, 1994).

Hypothesis 5: *Procrastination should correlate positively with national level self-discipline scores for English-speaking countries.*

METHODS

Data collection was conducted similar to that of Rentfrow et al. (2008). That is, self-reported procrastination and demographic information was obtained over the World Wide Web by using a noncommercial, advertisement-free website. In return for their involvement, respondents received feedback about their comparative level of procrastination and some suggestions regarding ways to reduce it. Respondents were attracted to the website through a variety of ways: 50.8% referring sites, 27.3% search engines and 21.9% direct traffic.

Data collection occurred over three years, between March 2007 and March 2010, imbedded in a series of other data collection efforts regarding procrastination. All participants were asked demographic items, including sex, age, marital status, family size, education, community size/location and national origin. Table 2 presents the participant profile by demographics. The procrastination scale used was the 9-item *Irrational Procrastination Scale* (IPS; Steel, 2010). The IPS correlates at .96 with the *Pure Procrastination Scale*, which is composed of the first factor extracted from the three widely used procrastination scales. As per Steel (2002, 2010), the IPS' test-retest reliability after four months is .67, and its correlation with conscientiousness is $-.45$, with impulsiveness .69 and with self-discipline $-.61$. Responses for the IPS were recorded on a 5-point scale (1 = *very seldom or not true of me*; 5 = *very often or true of me* or *very uncharacteristic of me* and *very characteristic of me*, depending on the administration). With the present sample, the IPS had good internal consistency ($\alpha = .91$; M score = 3.57, $SD = 0.85$).

Screening

Responses were first screened for duplication, eliminating responders who resubmitted the exact same data (i.e. procrastination scores and demographic information) more than once in the same hour. Also, demographic information was provided voluntarily, meaning that people potentially may receive procrastination feedback without completing a demographic profile. We eliminated all those individuals with an age of less than 16 years and who did not indicate their marital status. Finally, we eliminated any nonsensical responses regarding age and length of marriage (e.g. being younger than years of marriage), leaving a total sample size of 20 375.

RESULTS

Nationality appeared to have a significant relationship with procrastination, accounting for 4.1% of the variance (Table 3). This percentage was somewhat similar to other cultural investigations in that typically no more than 10% of cultural variance lies between countries (Steel & Taras, 2010). To

determine whether our use of an English-language-only scale limited the results to English-speaking countries, we compared national procrastination averages with national self-discipline, as per McCrae's (2003) research. Consistent with other cross-cultural studies, sample sizes vary considerably. For example, in Taras, Steel, and Kirkman's (in press) review of Hofstede's sampling efforts, they note 'over 60,000 people participated in the survey, though some countries were represented by less than a hundred respondents' (p. 1). Accordingly, we used weighted least squares multiple regression, which takes into account that some nations have been better estimated with larger sample sizes than others. Across all nations, our results were not significant: $F(1, 35) = .544$, $p = .47$. However, for our targeted English-speaking subset, that is, the eight available English language nations (i.e. USA, Australia, Canada, India, Ireland, New Zealand, Philippines and UK), results were strong and in the expected direction (i.e. negative) for self-discipline: $R^2 = .69$, $F(1, 7) = 15.54$, $p = .006$. Hypothesis 5 was confirmed.

In recognition that our results appear valid primarily for English-speaking countries, we confined our subsequent analyses to respondents from these nations only, comprising a total of 16 413 individuals. For these English-speaking countries, means, standard deviations and sample sizes are reported in Table 1. Descriptive demographic information for the categorical variables along with average procrastination scores are reported in Table 2. For the continuous variable, average age is 38.3 years old ($SD = 14.2$).

The correlation between *sex* and procrastination was $-.08$, exactly replicating the results from the two previous large-scale examinations of this question. Hypothesis 1a was confirmed; men procrastinate more than women. For *age*, the correlation size suggested that older adults may have more self-control, but the strength of the coefficient size was lower than previously detected, $-.10$ or $-.14$ after correcting for range restriction (based on a population SD of 19.5 years; Gröpel & Steel, 2008). Hypothesis 1b was confirmed; those younger procrastinate more than those older.

An ANOVA indicated that marital status was significantly related to procrastination, accounting for about 1.6% of the variance (Table 3). Subsequently, using regression dummy coding and controlling for age, we considered our hypotheses. First, are procrastinators likely to put off marriage and remain single? Including those who were widowed, divorced or separated in the marriage category and controlling for the

Table 1. Means and standard deviations for procrastination among eight English-speaking countries

English-speaking country	Mean procrastination score	Standard deviation	<i>N</i>
USA	3.48	0.86	13 025
Australia	3.84	0.83	383
Canada	3.71	0.82	1122
India	3.65	0.76	244
Ireland	4.03	0.75	79
New Zealand	3.80	0.82	76
Philippines	3.51	0.77	46
UK	3.89	0.83	871

Table 2. Demographic characteristics and average procrastination level of participants

Characteristic	<i>n</i>	%	Procrastination
<i>Sex</i>			
Male	6837	41.7	3.65
Female	9545	57.3	3.50
<i>Marital status</i>			
Single	7464	45.5	3.65
Married	7054	43.0	3.44
Separated	266	1.6	3.79
Divorced	1407	8.6	3.56
Widowed	222	1.4	3.53
<i>Family size</i>			
No kids	9750	62.1	3.61
With kids	5963	37.9	3.46
<i>Education</i>			
Grade school	71	0.4	3.52
Some high school	326	2.0	3.74
Complete high school	520	3.2	3.54
Some college	3091	18.9	3.70
College diploma	745	4.6	3.56
College degree	4891	29.9	3.62
Master's degree	4425	27.1	3.46
Doctorate degree	2283	14.0	3.42
<i>Community description</i>			
Farming	156	1.0	3.48
Rural	1658	10.1	3.47
Suburban	6721	41.1	3.56
Urban	7816	47.8	3.58
<i>Community size</i>			
Rural/country	353	2.2	3.41
Village (less than 1000)	297	1.8	3.64
Small town (1000–4999)	1263	7.9	3.50
Large town (5000–9999)	1408	8.8	3.53
Smaller city (10 000–49 999)	2724	16.9	3.54
Medium-sized city (50 000–500 000)	4035	25.1	3.58
Large city (over 500 000)	6002	37.3	3.58

effects of age, singles were more likely to be procrastinators ($r = .06$, $p < .0001$). Hypothesis 2a is confirmed; procrastinators are more likely to be single.

Second, are procrastinators more likely to be divorced or separated rather than married? As expected, we obtained a positive correlation of .07 ($p < .001$), meaning that procrastinators

Table 3. One-way analyses of variance for the relationship between procrastination, nationality and marital status

Variable	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	η^2/R^2
<i>Nationality</i>					
Between groups	137	596.93	4.36	6.25***	.041
Within groups	20 216	14 093.92	0.70		
<i>Marital status</i>					
Between groups	4	162.64	40.66	56.08***	.016
Within groups	16 408	11 895.74	0.73		

*** $p < .001$.

are less likely to remain married. Hypothesis 2b is confirmed. In addition, we explored whether procrastinators are more likely to put off divorce and remain separated. Focusing on just those separated or divorced, procrastinators are indeed more likely to be separated with a correlation of .08 or .12 corrected for uneven splits (approximately 15% are separated whereas 85% are divorced). Combined with hypothesis 2a, it appears that Moore (2004) was right; procrastinators are more likely to put off beginning as well as ending commitment.

Third, we considered family size. Are procrastinators more likely to put off having kids? The correlation is $-.09$ ($p < .001$), which shrinks to $-.04$ ($p < .001$) after controlling for age. Hypothesis 2c is confirmed; procrastinators tend to put off having kids or simply have fewer of them.

Education correlated with procrastination at $-.10$ ($p < .0001$), dropping to $-.08$ after controlling for age. Hypothesis 3a is confirmed. As Table 2 demonstrates, more education is typically associated with less procrastination, with the major exception of 97 participants (less than half a percentage point of the sample) who indicated they only had grade school. Otherwise, those who finished high school or college procrastinated less than those who had not. Consistent with Ferrari et al. (2009), those with advanced degrees procrastinated least of all.

In addition, we considered hypothesis 3b, whether procrastination mediates the relationship between sex and education. Using the entire sample, the correlation was .02. However, this low correlation between sex and education is largely due to counterbalancing. As we sample older respondents, we look increasingly at historical education trends, not present day, and here the sex ratio reverses. For example, for respondents 80 years or older, our oldest group, the correlation between sex and education was $-.29$ ($p = .02$), reflecting that during the 1950s men received substantively more education than women. Focusing on present day respondents in their early twenties, the results almost exactly match census data. We obtain a correlation of .10 between sex and education, with 55% of people who acquired their college degree or higher being women. The Sobel test of mediation was significant ($p < .0001$), and partialling out the effects of procrastination indicates that it accounts for approximately one third of the variance between sex and education. In other words, if men procrastinated as little as women typically do, an additional percentage point of men would be college graduates. In the USA, for example, this translates into an additional quarter million male graduates in the 18 to 29 year age group.

Focusing on community location, as per hypothesis 4, we expected a linear trend such that as locales become more urban, people would report higher levels of procrastination. The procrastination means from Table 2 indicates this trend proceeds as expected, but multiple regression reveals the trend was weak. *Community description* generated an R^2 of .001, $F(1, 16 349) = 18.82$, $p < .0001$, as did community size, R^2 of .001, $F(1, 16 080) = 16.99$, $p < .0001$. Hypothesis 5 was *not* confirmed; procrastination does *not* substantively increase as settings become more urban settings. However, a *post hoc* examination of means, as per Table 2, indicates that most of the reduction in procrastination occurs with rural living. Dichotomizing the sample into rural versus non-rural

and correcting for uneven splits increases the correlation to .10 ($p < .0001$).

DISCUSSION

Our epidemiological investigation indicates that procrastination is a trait that most groups share, with procrastinators capable of coming from any background. Still, procrastination did concentrate in certain areas. Accordingly, the prototypical procrastinator is an urban young man who has stopped or dropped out of school. As he grows older, he is more likely to remain single or separated rather than be in a committed relationship and he has chosen or put off having kids. He is also likely to come from a country that reports lower levels of self-discipline. As per McCrae (2003) then, procrastination is likely more of a concern for Austrians and Russians, who tend to report lower levels of self-discipline, than it is for the Dutch and Danes, who tend to report higher levels.

The strength of procrastination's connection with these demographic indicators is similar and even somewhat stronger than what was obtained with its proxy personality traits (i.e. analogous or overlapping constructs). For example, conscientiousness correlates with socioeconomic status at $-.09$ (Roberts et al., 2007), slightly lower than what we observe procrastination correlating with education. Similarly, conscientiousness correlates at $-.13$ with divorce whereas procrastination correlates at $-.14$ (before controlling for age of the respondent). The strength of these correlations is typical of what is seen in the psychological field (Richard, Bond & Stokes-Zoota, 2003) and, as Roberts et al. (2007) reviewed, sufficient for directing public policy.

Consequently, rising procrastination levels speaks to a variety of social issues. For example, many Eastern European and European countries, such as Spain, are in population decline because of decreasing fertility rates (Nugent & Seligman, 2008). As procrastinators tend to put off having children, couples or individuals putting off parenthood past peak fertility to their later regret should be one of several contributing factors (Schippers, 2011). Similarly, Kasearu and Kutsar (2010) reported 'unmarried cohabitation is a trend which is spreading across Europe' (p. 309). Again, although there are a variety of economic factors (Gutiérrez-Domènech, 2008), simply procrastination should play its role; procrastinators are more likely to be single, having put off romance. Also, as men tend to procrastinate more, it helps to explain why we see lower levels of saving and higher levels of borrowing as sex ratios of groups become increasingly male biased (Griskevicius et al., 2012).

In particular, we found good evidence that procrastination is likely contributing to the education gap between men and women. Duplicating census data, 55% of graduates in their twenties were women, compared with 45% of men. If procrastination could be controlled for, the ratio would be 54% women to 46% men. There is good reason to believe that this relationship is causal. First, men procrastinate more than women. Second, as reviewed in the Introduction (e.g. Lubbers et al., 2010; Steel, 2007), educational achievement has been repeatedly shown to be harmed by poor self-

regulation, especially procrastination which is, by definition, putting off until later despite expecting to be worse off. Reflecting its importance, many universities, from Cambridge to Oxford to Harvard, have dedicated services or workshops designed to reduce procrastination among their students. Of note, an additional percentage point of male graduates would make a substantial dent in this problem, providing an additional quarter million male graduates in the USA alone. Fortunately, procrastination is very treatable (Steel, 2011). It is apparent that as external institutional and societal obstacles to education are removed, internal qualities such as personality necessarily become the primary determinants of educational achievement.

Future research directions

Although the results here were based on a large and diverse sample, several avenues for future research should be considered. To begin with, it would be fruitful to continue exploring these topics through additional methodologies. Although Gosling, Vazire, Srivastava, and John (2004) have found that web-based surveys such as this usually provide results consistent with traditional methodologies, and we replicated key findings (e.g. percentage of young women graduating from college), all sampling methodologies have their limitations. Ideally, for example, a longitudinal investigation tracking academic behaviour of high school students through to their college years can almost unequivocally confirm if a self-regulatory deficit is preventing young men from reaching their potential.

It is notable that procrastination showed one of its strongest associations with marital status. Procrastinators were more likely to put off starting and ending relationships. Traditionally, procrastination has been studied in relations to health, work and education, but it is apparent that procrastination can have a significant impact across any life domain. Steel (2011) surveyed approximately 4000 respondents and found procrastination in multiple venues, such as 11.4% reporting it to be a problem for Leisure (e.g. 'Procrastinating about joining a sports team, about going on a trip') or 19% reporting it to be a problem with Family (e.g. 'Procrastinating about talking more to your mom, about having dinner with your parents'). Future research might consider ascertaining the cost of procrastination as well as how to help reduce levels of procrastination in non-work domains.

Further investigation should explore Kaplan and Berman's (2010) contention 'that urban environments tend to be poor environments for restoring directed attention' (p. 48). Although a small effect was detected here, it was mostly relegated to those who reported residing in a rural dwelling, with the effect almost completely disappearing even at the village level. Subsequent investigations may consider the percentage of time people actually spend in natural settings, not just their proximity, especially since the increasing ubiquity of Internet connected computer use. Surfing the Internet should be phenomenologically the same regardless of whether the room you are sitting in is nominally in the city or in the country.

Finally, to expand the global investigation of procrastination, we should choose to use translated versions of the procrastination scale. The English-only administration of this study made the findings most appropriate to English-speaking countries. To this end, Ferrari et al. (2009) already have administered translated versions of the primary procrastination scales to several nations (e.g. Spain, Peru, Venezuela and Turkey). Although the analysis was questioned by Steel (2010), the original data can be readily provided in other formats. Alternatively, it would be desirable to assess national procrastination via other methods rather than self-report as the degree to which self-report personality scores can reflect national culture is not entirely clear, especially with regards to conscientiousness-related constructs (Heine, Buchtel & Norenzayan, 2008; Taras, Kirkman & Steel, 2010). As Taras et al. (2010) recommended in their cross-cultural monograph, 'Culture research would benefit by adopting a multisource research design, rather than relying exclusively on self-report, survey-based designs' (p. 435). For example, creating a scale by combining observed incidents of delay such as in finance (e.g. retirement savings), health (e.g. seeing your dentist) and academia (e.g. studying for exams) may prove superior. In the end, if nations such as the UK, the USA or Peru are interested in countering issues pertaining to procrastination, we should try to help them identify the degree to which it is occurring and with which groups.

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