



Why the Danes Are the Happiest People on Earth

The Selective Outmigration By *Personality Hypothesis* (SOPHy) of Group Character

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Abstract: We propose a new hypothesis – Selective Outmigration by *Personality Hypothesis* (SOPHy) – to explain how Scandinavians have come to exhibit the highest levels of subjective well-being in the world. We assume that Viking men might have been similar in personality to modern violent and property criminals, who are low in Conscientiousness and Agreeableness and high on Neuroticism. Since less Conscientious and Agreeable and more Neurotic individuals are on average less happy, their selective outmigration from Scandinavia during the Viking Age (793–1066) could have elevated the genetic tendency to be happy among Scandinavians left behind. Our calculations show that genetic selection alone could have produced the current Scandinavian genetic advantage in happiness under reasonable assumptions. The same process may also explain the exceptionally low level of happiness among Russians, who descended from Vikings. The Viking Age was a rare historical event in selective outmigration by personality not shared by other examples of mass outmigration, such as Genghis Khan’s army, the Crusades, and penal colonies in Australia. Other examples of SOPHy might include the emigration of Japanese laterborns (birth order qua personality) and the Irish Potato Famine (occupation qua personality). Our hypothesis awaits empirical testing with historical, archeological, and population genomic data.

Keywords: Amish, life satisfaction, World Database of Happiness, World Happiness Report

One of the persistent mysteries in the field of positive psychology is the consistently high levels of happiness in the Scandinavian and Nordic countries of Denmark, Sweden, Norway, Finland, and Iceland (Diener et al., 1995). While people in wealthier nations are in general happier than those in poorer nations, and people in peaceful representative democracies are in general happier than those in violent autocracies and dictatorships, the economic and political factors cannot entirely account for the consistently high levels of happiness in Scandinavian and Nordic nations because citizens of comparably wealthy and peaceful democracies, such as France and Italy, do not typically report equally high levels of subjective well-being (Graham, 2009). What accounts for the high levels of happiness in Scandinavian and Nordic countries?

Proto and Oswald (2016) present convincing evidence that the cause of national differences in happiness may be genetic. They present three different lines of evidence. First, the average level of happiness in a nation is predicted by its average genetic distance from Denmark, using Nei’s (1972) classic definition of genetic distance between populations. (Their results, however, are not dependent on Denmark as the focal nation. The results are similar if

they choose Sweden, Norway, or the Netherlands.) Second, relying on previous research that shows that individuals with a short form of the 5-HTTLPR gene experience a greater risk of depression (Caspi et al., 2003), they show that Denmark, Finland, and the Netherlands have the lowest proportion of individuals with the short allele of 5-HTTLPR among European nations. (However, it is a common mistake to equate depression with low levels of happiness, as the two are not the same and the same factors do not predict both; Kanazawa & Li, 2015, p. 115.) Third, and perhaps most convincingly as evidence of genetic – not economic, political, and social – determination of national differences in happiness, the level of happiness of Americans correlate very strongly with that of citizens of nations from which their ancestors hail. In other words, Danish Americans are in general happier than Italian Americans, just as Danes are happier than Italians in their respective countries, despite the fact that Danish and Italian Americans were born, raised, and spent their entire lives in the United States. While Proto and Oswald (2016) themselves call their study “a cautious exploration” in the article’s subtitle, others have replicated their findings and established a strong genetic component in national

differences in happiness (Inglehart et al., 2014; Minkov & Bond, 2017).

While Proto and Oswald's (2016) data very convincingly demonstrate that the cause of Scandinavian and Nordic advantage in subjective well-being is likely genetic, their analysis nevertheless leaves a further question unanswered: *Why* do Scandinavians and Nordic citizens have genetic advantage in happiness? How did they come to possess in greater frequencies the genes conducive to higher levels of happiness that even their nearby European neighbors seem to lack? What's so special and different about Scandinavia and Nordic countries?

In this paper, building on earlier work by Weight and Harpending (2017) in quantitative genetics, we propose a new hypothesis called the Selective Outmigration by Personality Hypothesis (SOPHy) that, among other things, can explain why Scandinavians might have come to possess genes that are conducive to higher levels of happiness in greater frequencies.

The Emergence of Amish Personality by Genetic Selection

The Amish are an Anabaptist sect in North America. Anabaptists do not believe in baptizing children, and their members can only officially join their church when they choose to be baptized as adults. While a vast majority of Amish elect to be baptized and join the church, to continue the Amish way of life, a small minority in every generation choose not to and leave their colonies to pursue non-Amish life (Hostetler, 2013).

Wittmer (1970) administered the Cattell 16PF personality questionnaire to 25 Amish and 25 non-Amish 18- to 20-year-old men in Daviess County, IN. His analysis showed that the Amish were significantly more homogeneous than the non-Amish on nine of the 16 personality factors. Weight and Harpending (2017) performed a principal component analysis on Wittmer's original data and discovered that the Amish and non-Amish men were 2.8 *SD* apart on the first extracted component, which they call the AQ (Amish Quotient). The AQ mostly consisted of conscientiousness, persistence, and the traits "radical" and "experimental." The Amish men were higher on conscientiousness and persistence, and lower on the traits "radical" and "experimental." The Amish are also known to be extremely Agreeable (Hostetler, 2013); as one of the authors (Lopez) noted on his visit to an Amish colony, Amish babies seldom cry. In his study of another Anabaptist sect in North America, the Hutterites, Hostetler notes: "Many of those who defected permanently had experienced long-term disputes with the householder, the preacher, or the German

teacher. Leaving the colony in most cases was premeditated and touched off by arguments or antagonisms with superiors" (Hostetler & Huntington, 1967, p. 104), suggesting that Disagreeable individuals may be particularly likely to leave the Hutterite colony. He also notes: "The Hutterites believe that defection occurs largely in certain "weak" family lines" (Hostetler & Huntington, 1967, p. 104), suggesting that the tendency toward defection due to low HQ (Hutterite Quotient) may be heritable.

Weight and Harpending (2017) wondered whether such a large difference in AQ (2.8 *SD*) could have emerged purely by genetic selection, whereby individuals born into the Amish colonies who are low on AQ selectively leave the Amish life, generation after generation, thereby continually increasing the mean level of AQ among those who choose to remain. They assumed that the bottom 10% of individuals on AQ would leave the colony in each generation, the AQ had a heritability of $h^2 = .50$, and each Amish generation was 25 years. Their quantitative genetic calculations showed that it would take 28 generations or 700 years for the Amish to have a 2.8 *SD* higher level of AQ by genetic selection alone. Since the Amish have existed as a distinct sect only since 1693 (Hostetler, 2013, p. 8) and had therefore existed for less than 300 years before Wittmer collected his data in 1970, Weight and Harpending (2017) concluded that it was impossible for the Amish to have come to possess their distinctly high level of AQ (high in conscientiousness and persistence and low in their tendency to be radical and experimental) through genetic selection alone and that cultural socialization must also have been employed to form their distinct group character, which is so different from the non-Amish.

According to John A. Hostetler (2013, p. 11), perhaps the greatest authority on the Amish in North America, the average "boiling off" (outmigration) rate in most Amish colonies is 15%, not 10% as Weight and Harpending (2017) estimated. Using 15% as the outmigration rate while keeping all the other parameters intact only reduces the number of generations required to achieve a 2.8 *SD* higher level of AQ from 28 generations (700 years) to 19.47 generations (486.75 years). Since this is still much longer than 11.08 generations (277 years) of the entire Amish existence prior to 1970, Weight and Harpending's original substantive conclusion stands that genetic selection alone was not sufficient to achieve the 2.8 *SD* higher level of AQ. On the other hand, some scholars trace the origins of the Anabaptist movement all the way to the Waldensians in France in 1173 (van Braght, 1987; Preheim, 2017), long before even the Reformation and the Radical Reformation in the 16th century. If genetic selection for what eventually became AQ began, however slowly, before the official founding of the Amish sect, as early, perhaps, as the 12th century, then genetic selection alone might have been sufficient to

produce the current 2.8 *SD* difference in AQ among the contemporary Amish.

Weight and Harpending's (2017) quantitative genetic model – which we call the Selective Outmigration by Personality Hypothesis (SOPHy) – can be applied to analyze the emergence of other distinct group characteristics. We explore below whether SOPHy can account for the distinctly (and likely genetically determined) high levels of happiness among Scandinavians. We hypothesize that individuals who were particularly likely to experience low levels of happiness – because they were low on Conscientiousness and Agreeableness and high on Neuroticism – were more likely to leave Scandinavia to become Vikings during the Viking Age, never to return to Scandinavia, because they settled elsewhere or died during their Viking activities of murder, rape, pillage, and burn.

Rentfrow et al. (2008) earlier discussed geographical variation in psychological characteristics. While they do mention selective migration by genetic predisposition as one potential cause of such geographical variation (p. 342), their theoretical model (articulated in Figure 1, p. 344) nonetheless mostly focuses on institutional and environmental effects on personality rather than selective migration by genetic tendencies. Their model therefore presumes a very high degree of malleability of personality, which is not consistent either with the strong heritability of personality or its life-course persistence (Krueger & Johnson, 2008; McCrae & Costa, 2008). In principle, SOPHy applies not only to international outmigration but also to internal migration within a country, such as the California Gold Rush in the middle of the 19th century (Brands, 2002). However, given that internal migration tends to be less permanent than international immigration and that subnational internal boundaries (such as state borders) tend to be more permeable than international boundaries, such internal migration is expected to result in less pronounced geographical differences in happiness and personality.

The Viking Age

There is no consensus among historians as to what launched “the Viking Age,” which is conventionally dated from 793 to 1066 (Brink, 2008, p. 5; Jesch, 1991, pp. 1–8; Wolf & Mueller-Vollmer, 2018, pp. ix–xiii), but one of the leading theories is “the marriage imperative” (Barrett, 2008, pp. 676–677). Pagan Scandinavians long practiced widespread female infanticide and created a severe shortage of women and surplus of mateless men (Clover, 1988). Other Viking scholars point to polygyny and concubinage, rather than female infanticide, as the root cause

of the male-biased sex ratios in Scandinavia at the dawn of the Viking Age, but nevertheless concur that it was the severe shortage of available reproductive women that launched the Viking Age (Raffield et al., 2017). Female infanticide, polygyny, and concubinage could all create a surplus of mateless men, and such mateless men were then driven to seek available mating opportunities overseas in their Viking expeditions. From an evolutionary perspective, one of the primary causes of wars, invasions, and intergroup conflicts is the shortage of reproductive women and the need for mateless men to capture and abduct them from neighboring societies (Chagnon, 2013; Kanazawa, 2009). Strong evidence in support of the marriage imperative hypothesis is the molecular genetic findings from Iceland, where the Vikings settled, that 75–80% of the founding male population came from Scandinavia whereas nearly two-thirds (63.5%) of the founding female population came from the British Isles (Helgason et al., 2000, 2001).

The operational sex ratios in various districts in Norway before the dawn of the Viking Age are estimated to have ranged from 1.7:1 in 7th-century Nordland to 20:1 in 8th-century Gloppe (Dommasnes, 1982, p. 82, Table III). Even if we take the most conservative estimate of 1.7:1, it means that 41% of men in Norway before the dawn of the Viking Age were destined to be mateless ($1/1.7 = .5882$). For Norse men embarking on Viking journeys, “return was doubtful” because “risks were manifold and manifest – from shipwreck and disease to violent death in battle” (Barrett, 2008, p. 680).

If as many as 40% of Norwegian (and other Scandinavian) men became Vikings, left their homelands in search of mating opportunities elsewhere, and never returned home, then this is a significant selection pressure that can radically alter the distribution of personality traits over a very few generations, as per Weight and Harpending's (2017) quantitative genetic model. But what was the typical personality of Vikings? What were the essential features of VQ (Viking Quotient)?

Viking Personality

It is impossible now to know the exact personality profiles of the Vikings, who lived a millennium before the birth of modern personality psychology and the Big Five personality factor model. Given the extremely brutal and violent behavior for which they were known, however, we can make a reasonable assumption that the Vikings might have been similar to individuals who commit violent and property crimes today. For example, Raffield (2019) relies on literary evidence to note that Scandinavian boys during the Viking

Age were selectively inducted into the Viking warrior class for their violent and murderous tendencies. An Icelandic saga *Egils saga Skallagrímssonar* describes an episode in which the protagonist Egil is beaten and humiliated by an older boy named Grímr in a game of *knattleikr* (a ball-and-stick game). Egil later returns to the field with an axe and kills Grímr. When Egil's mother hears of the murder, she praises her son and states that he has the markings of a future Viking warrior.

Historians and archeologists concur that the level of violence, brutality, and depredation exhibited by Vikings in their raids far exceeded the level that was common even by the otherwise brutal standards of the Early Middle Ages (Dumville, 2008; Jesch, 2015; Keynes, 1997; Nelson, 1997; Ó Corráin, 1997, 2008; Wolf & Mueller-Vollmer, 2018). Wulfstan II, Archbishop of York, vividly describes the devastation wrought by Viking raids in his homily *Sermo Lupi ad Anglos*:

We pay them continually and they humiliate us daily; they ravage and they burn, plunder and rob and carry on board; and lo, what else is there in all these events except God's anger clear and visible over this people? (Keynes, 1997, p. 81)

Because the devastation and humiliation by the Vikings were so extreme that the English believed that it was God's punishment for their sins. Wulfstan's descriptions are reminiscent of Mafia extortions a millennium later, except much more extreme and violent.

The Vikings were no less brutal in their raids on Ireland.

In 944 Conglach, [Viking] king of Brega, and the [Viking] king of Leinster had united against Dublin in a pincer movement and sacked the city with a new ferocity: "The destruction brought upon it was this: its houses, house-enclosures, its ships and its other structures were burned; its women, boys and common folk were enslaved; its men and its warriors were killed; it was altogether destroyed, from four persons to one, by killing and drowning, burning and capture, apart from a small number that fled in a few ships and reached Dalkey." Congalach attacked Dublin again in 948, killed its ruler, and 1,600 of its troops were either killed or taken prisoner (Ó Corráin, 2008, p. 432).

Recall that even Hitler murdered "only" two-thirds of European Jews (Waxman, 2004, p. 506, n40), much lower than the three-quarters murder rate achieved by the Vikings in at least some of their raids. The enslavement of the Irish by the Vikings was so horrendous that a contemporary annalist called it "the Babylonian captivity of Ireland, second only to the captivity of hell" (Ó Corráin, 2008, p. 432).

It is instructive to recall that the English word "ransack" derives from the Old Norse word *rannsaka* (Ó Corráin, 1997, p. 104). So does the phrase "going berserk."

At least some of these [Viking] groups seem to have belonged to a class of warriors that are represented in written sources by the berserkers (ON [Old Norse] *berserkir* and *ulfhednar* - "bare shirts" and "wolf hides"). As noted in *Haraldskvæði* (v. 8), *Grettis saga* (ch. 19), *Örvar-Odds saga* (ch. 14), and *Ynglinga saga* (ch. 6), berserkers were characterized by uncontrollable rages and exhibited animalistic traits during combat, such as howling and screeching. Significantly, descriptions of these traits are not confined to the sagas. Tenth-century accounts of conflict between Byzantine and Rus' forces by Leo Diaconus and John Skylitzes note how the Scandinavian warriors were consumed by madness and howled like animals (Raffield et al., 2016, p. 43).

Viking violence was not always confined to their victims but was often directed at each other.

[The Viking king] Amlaíb was back in business in 869: he plundered Armagh, burned its oratories, and killed or captured 1,000 of its inhabitants. Dublin was fought over by three families. At this point Amlaíb disappears from the records; his son Oistin was murdered by Danes in 875; Barid (perhaps another son of Ímar) is called "a great Viking tyrant" by the annalist who ascribes his death and burning in Dublin in 881 to God and St Cianán. There were more dynastic feuds and killings in 883, 888, and 893 when the Dubliners divided into two campuses, one led by a son of Ímar and the other by Earl Sigfrith. In 896 his fellow Vikings killed Sitric, son of Ímar, and the Irish his brother. They still could raid deep into the hinterland: in 890-1 they plundered Ardbraccan, Donaghpatrick, Dulane, Glendalough, Kildare, and Clonard, and in 895 they attacked Armagh and took 710 prisoners (Ó Corráin, 1997, p. 92).

Once again, these "dynastic feuds" between various Viking kings are reminiscent of how different Mafia families violently compete for dominance of local vice markets a millennium later, except much more violent.

A large number of both empirical studies (Collins & Schmidt, 1993; Möttus, Guljajev, et al., 2012; O'Riordan & O'Connell, 2014; Ortiz-Tallo et al., 2007) and meta-analyses (Jones et al., 2011; Miller & Lynam, 2001) demonstrate that individuals low on Conscientiousness and Agreeableness and high on Neuroticism are more likely to commit violent and property crimes, although, interestingly, there is some evidence that prison inmates may

develop higher Conscientiousness and Agreeableness than the general population *as a result of* and *in response to* prison life (Eriksson et al., 2017; Shimotsukasa et al., 2019; Thiry, 2012). So we believe it is reasonable to speculate that Vikings might have been low on Conscientiousness and Agreeableness and high on Neuroticism compared to other Scandinavians in their environment a millennium ago.

As it turns out, this exact combination – low Conscientiousness, low Agreeableness, and high Neuroticism – is a recipe for low happiness. DeNeve and Cooper (1998) conducted a large meta-analysis of personality correlates of subjective well-being and discovered that overall subjective well-being was positively associated with Conscientiousness ($r = .21$) and Agreeableness ($r = .17$) and negatively associated with Neuroticism ($r = -.22$). Anglim et al.'s (2020) more recent and much larger meta-analysis similarly shows that satisfaction with life is positively associated with Conscientiousness ($r = .27$) and Agreeableness ($r = .20$) and negatively associated with Neuroticism ($r = -.39$). It further shows that positive affect is positively associated with Conscientiousness ($r = .35$) and Agreeableness ($r = .19$) and negatively associated with Neuroticism ($r = -.34$), and negative affect is negatively associated with Conscientiousness ($r = -.25$) and Agreeableness ($r = -.25$) and positively associated with Neuroticism ($r = .56$). DeNeve and Cooper's (1998) and Anglim et al.'s (2020) findings suggest that modern-day criminals, and Vikings a millennium ago, might have been less happy than their counterparts.

A previous study shows that, among Britons, Germans, and Australians, those with higher Neuroticism and lower Agreeableness were more likely to migrate compared to others (Jokela, 2011), consistent with our prediction. Knudsen (2022) found that more collectivist Scandinavians were less likely to migrate to North America during the 19th century. Since psychological collectivism is significantly positively correlated with Agreeableness (Jackson et al., 2006), Knudsen's (2022) data are also consistent with our prediction.

Selective outmigration of less Conscientious, less Agreeable, and more Neurotic – and thus less happy – Scandinavian men as Vikings would have resulted in temporary sex differences in personality and happiness among Scandinavians left behind. After such outmigration, Scandinavian men who did *not* become Vikings were expected to be more Conscientious, more Agreeable, and less Neurotic – and thus happier – than Scandinavian women in general. However, such sex differences would have been temporary, as the genetic tendencies toward certain personality types and happiness levels are transmitted from both parents to both sons and daughters equally. There is no evidence that personality is transmitted strictly along sex, from fathers only to sons and from mothers only to daughters (Krueger & Johnson, 2008).

Can SOPHy Account for the Higher Levels of Happiness Among Scandinavians Today?

Can selective outmigration by personality *alone* account for the Scandinavian advantage in happiness today? We seek to answer this question by posing two related questions: How long would it take for Scandinavia to achieve its current advantage in happiness if we assume the most conservative outmigration rate? How large would the outmigration rate have to be if we assume that Scandinavians achieved their current advantage in happiness entirely during the Viking Age? In order to answer these questions, we rely on two major sources of mean happiness in different nations: Ruut Veenhoven's World Database of Happiness (2010–2018) (https://worlddatabaseofhappiness.eur.nl//hap_nat/nat_fp.php?mode=8&ranks=1); and the World Happiness Report (2017–2019) (Halliwell et al., 2020).

How Long Would It Take for Scandinavia to Achieve Its Current Advantage in Happiness if We Assume the Most Conservative Outmigration Rate?

In order to answer the first question, we assume that the operational sex ratio in Scandinavia before the dawn of the Viking Age was 1.7:1.0, taking the most conservative estimate by Dommasnes (1982, p. 82, Table III). That would mean that roughly 40% of Scandinavian men were mateless and thus were driven to seek mates elsewhere by becoming Vikings. This would imply an outmigration rate of about 25%. In a hypothetical Scandinavian village with 100 men and 60 women (the other 40 women having been eliminated by female infanticide), 40 men leaving would mean 25% ($40/(100 + 60) = .25$) outmigration rate.

We define Scandinavian Quotient (SQ) as a combination of high Conscientiousness, high Agreeableness, and low Neuroticism that all incline toward a higher level of happiness, in the same way Weight and Harpending (2017) defined AQ as a combination of high conscientiousness, high persistence and low tendencies toward being radical and experimental. SQ is the exact opposite of VQ. Following Weight and Harpending (2017), and Kanazawa's (2012, pp. 45–47) “50-0-50 rule,” in which he suggests that most personality traits and other individual differences follow the pattern of 50% heritable, 0% attributable to shared environment, and 50% attributable to the unshared environment (Harris, 1995, 1998), we assume the heritability of SQ to be $h^2 = .50$. According to Geijer (1896), young Norse men typically started their careers as Vikings around age 15 and, if they survived, settled down with family by age

20. Thus, we assume that the generation time for Vikings was around 20 years.

We posit three alternative scenarios. First, we assume that, at the dawn of the Viking Age, before any genetic selection for SQ began, Scandinavians were similar to Germans and Brits in their mean level of happiness. Second, we assume that, at the dawn of the Viking Age, Scandinavians were average in their level of happiness, with their mean level of happiness at the mean of the entire world. Third, we assume that, at the dawn of the Viking Age, Scandinavians were *the least happy people on earth*, comparable to those in the Central African Republic, South Sudan, or Togo today.

According to our calculations using the World Database of Happiness (see the details in Appendix A), in the first scenario, where Scandinavians were comparable to Germans and Brits, it would have taken only 4.32 generations or 86.4 years for them to achieve their current genetic advantage in happiness. In the second scenario, if Scandinavians were about average in their level of happiness at the dawn of the Viking Age, it would have taken 10.42 generations or 208.38 years for them to achieve their current genetic advantage in happiness. Both of these time spans are less than the length of the Viking Age, which is conventionally defined to last 273 years, from 793 to 1066. So genetic selection alone would have been sufficient to produce the current Scandinavian advantage in happiness under the first two scenarios. However, under the third scenario, in which Scandinavians were the least happy people in the world in 793, it would have taken 21.16 generations or 423.18 years for them to achieve their current genetic advantage in happiness by genetic selection alone. So genetic selection by selective outmigration by personality alone would not be sufficient to produce the current genetic advantage under the third (deliberately unrealistic) scenario.

Figure 1 presents the results of our numerical exercise graphically. It shows that, under the first scenario, where we assume that the Scandinavians were comparable to the British and the Germans in happiness (7.3) at the beginning of the Viking Age in 793, it would be 879 before they achieve the current level of happiness (8.3), if we assume the Viking outmigration rate of 25%, heritability of personality of $h^2 = .50$, and the Viking generation of 20 years. Under the same assumptions, it would be 1001 before the Scandinavians achieved their current level of happiness if we assume that they were at the world's average (5.9) at the beginning of the Viking Age in 793. Both of these years are well within the Viking Age (793–1066). However, if we assume that the Scandinavians were the world's unhappiest people (3.4) at the beginning of the Viking Age, then it would be 1216 before they achieved their current level of happiness. This would be a century and a half after the end of the Viking Age.

How Large Would the Outmigration Rate Have to Be if We Assume That Scandinavians Achieved Their Current Advantage in Happiness Entirely During the Viking Age?

We now pose a slightly different question. We assume that Scandinavians took the entire 273 years of the Viking Age to achieve their current genetic advantage in happiness, and ask how large the outmigration would have had to be in each generation in order for them to achieve their genetic advantage in 273 years.

We once again posit the same three scenarios. Under the first scenario, where Scandinavians in 793 were comparable to Germans and Brits in average happiness, roughly 10% of Scandinavian men would have to become Vikings in each generation. Under the second scenario, where Scandinavians were at the world's average in happiness before the dawn of the Viking Age, roughly 27% of Norse men would have to migrate out of Scandinavia in each generation in order for Scandinavia to achieve its current advantage in 273 years. Both of these estimates are consistent with the consensus among historians that only a minority of Norse men became Vikings (Williams, 2008; Wolf & Mueller-Vollmer, 2018, pp. 25–36). However, under the third scenario, where Scandinavians in 793 were the least happy people on earth, about 51% of Norse men would have to become Vikings, leave their countries, and never return to Scandinavia to achieve its current advantage in happiness in 273 years. This is inconsistent with the historians' consensus. However, it is nonetheless interesting to note that, *even if Scandinavians were the unhappiest people on earth in 793*, they could still come out as the happiest people on earth in 1066 if half of Norse men became Vikings.

Thus, for both of these slightly different questions, SOPHy appears plausible, and genetic selection alone is sufficient to produce the current Scandinavian advantage in happiness, if Scandinavians were at least around the world's average in happiness at the dawn of the Viking Age. However, SOPHy is disconfirmed, and genetic selection alone would not be sufficient, if Scandinavians were the least happy people on earth in 793. However, we consider the third scenario to be somewhat unrealistic.

Replications With the World Happiness Report (2017–2019)

For robustness checks, we repeated the detailed calculations above with the World Happiness Report (2017–2019) (Halliwell et al., 2020) (see Appendix B). The substantive conclusions were identical to those drawn from the calculations with the World Database of Happiness.

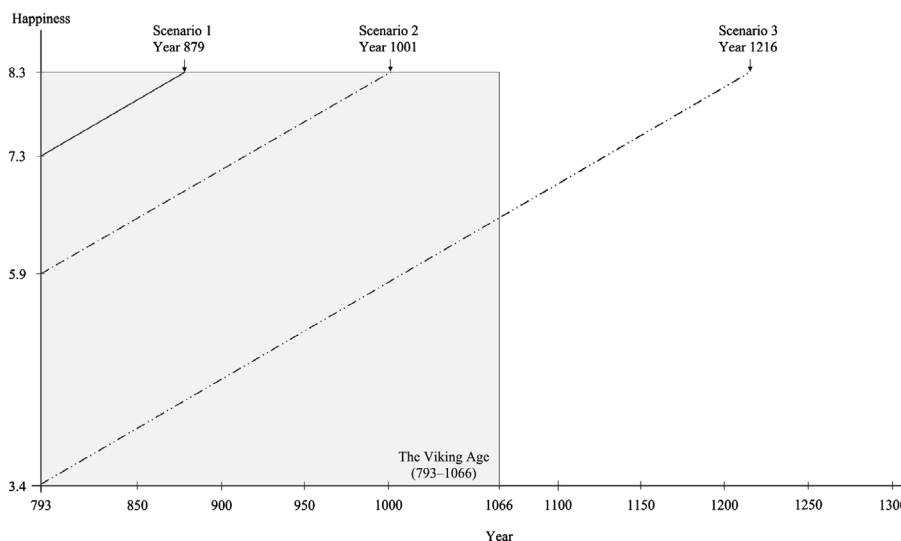


Figure 1. How long it would take the Scandinavians to achieve the current advantage in happiness, under three alternative scenarios, World Database of Happiness (2010–2018). Scenario 1: the Scandinavians were comparable to the British/Germans in happiness at the beginning of the Viking Age (793) (happiness = 7.3). Scenario 2: the Scandinavians were at the world's average in happiness at the beginning of the Viking Age (793) (happiness = 5.9). Scenario 3: the Scandinavians were the world's unhappiest people at the beginning of the Viking Age (793) (happiness = 3.4).

With regard to the first question, our calculations with the World Happiness Report data show that the length of time for the Scandinavians to achieve the current advantage in happiness via SOPHy would be 55.72 years (2.786 generations) if we assume that the Scandinavians were comparable to Germans at the dawn of the Viking Age, 212.40 years (10.620 generations) if we assume that the Scandinavians were at the world's average, and 496.52 years (24.826 generations) if the Scandinavians were the unhappiest people on earth (comparable to Afghans today in the World Happiness Report). Thus, we once again arrive at the conclusion that SOPHy alone was enough to produce the current Scandinavian advantage in happiness during the Viking Age if the Scandinavians were at least at the world's average in happiness in 793.

Figure 2 presents the results of our replication of the World Happiness Report. It shows that the conclusions are qualitatively identical to the results obtained from the World Database of Happiness presented in Figure 1. Under the same assumptions about the Viking outmigration rate, heritability of personality, and the Viking generation time, it would be 849 before the Scandinavians could achieve their current level of happiness (7.7) under the first scenario where we assume that they were comparable to Germans in happiness (7.1) at the beginning of the Viking Age in 793. It would be 1005 if we assume that the Scandinavians were at the world's average in happiness (5.5) at the beginning of the Viking Age. Once again, both of these years are well within the Viking Age (793–1066). However, if we assume that the Scandinavians were the world's unhappiest people (2.6), then it would be 1290 before they achieved their

current level of happiness, more than two centuries after the end of the Viking Age.

With regard to the second question, our calculations with the World Happiness Report data show that, in order for the Scandinavians to experience the current advantage in happiness solely via SOPHy, 7% of Scandinavian men would have to become Vikings if we assume that the Scandinavians were comparable to Germans, 27% if we assume that the Scandinavians were at the world's average, and 60% if we assume that the Scandinavians were the unhappiest people on earth. Thus, once again we arrive at the identical substantive conclusion that SOPHy alone was sufficient to produce the current Scandinavian advantage in happiness during the Viking Age if the Scandinavians were at least at the world's average in 793.

Are Scandinavians Today More Conscientious, More Agreeable, and Less Neurotic?

If SOPHy is correct, and Scandinavians today enjoy a genetic advantage in happiness because less Conscientious, less Agreeable, and more Neurotic Scandinavians left their homelands during the Viking Age to pursue Viking activities, then it follows that, not only are contemporary Scandinavians happier than their European neighbors, but they are also more Conscientious, more Agreeable, and less Neurotic today as well.

There appears to be some evidence for these predictions. Data from the Gosling-Potter Internet Personality Project

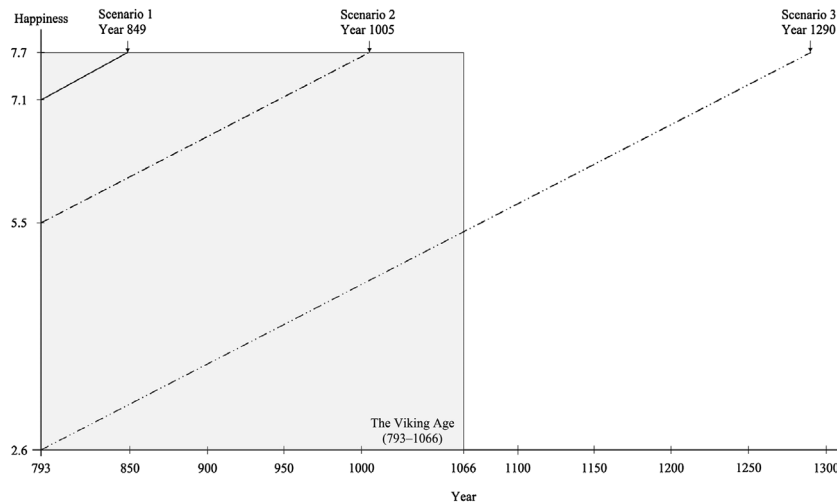


Figure 2. How long it would take the Scandinavians to achieve the current advantage in happiness, under three alternative scenarios, World Happiness Report (2017–2019). Scenario 1: the Scandinavians were comparable to the Germans in happiness at the beginning of the Viking Age (793) (happiness = 7.1). Scenario 2: the Scandinavians were at the world’s average in happiness at the beginning of the Viking Age (793) (happiness = 5.5). Scenario 3: the Scandinavians were the world’s unhappiest people at the beginning of the Viking Age (793) (happiness = 2.6).

(Gebauer et al., 2015), to date the largest data on the Big Five personality factors, with 2,718,838 participants from 106 countries, confirm all of our predictions. Danes, Norwegians, and Swedes are all above the world’s mean in Conscientiousness and Agreeableness, and (far) below the world’s mean in Neuroticism. Scandinavians are particularly remarkable in their low levels of Neuroticism. Denmark is *the least* Neurotic nation in the sample of 106 nations in the Gosling-Potter Internet Personality Project; Norway is the fifth least Neurotic and Sweden is the sixth least Neurotic.

Bar and Otterbring (2021) show that Danes are more Conscientious, more Agreeable, and less Neurotic than either Americans or Germans. Attesting to the largely genetic determination of personality, Özdemir et al. (2021) show that Turkish individuals living in the vastly different nations of Denmark and Turkey are no different from each other in their mean levels of Big Five personality factors, except that those living in Turkey are significantly more Neurotic. We hasten to note, however, that the fact that Scandinavians are more Conscientious and Agreeable and less Neurotic can be logically deduced from two other findings discussed above – that Scandinavians are on average happier (Diener et al., 1995; Proto and Oswald, 2016) and that more Conscientious, more Agreeable, and less Neurotic individuals are happier (Anglim et al., 2020; DeNeve & Cooper, 1998). It is therefore not uniquely derivable from SOPHy and is not direct evidence for it.

Viking Immigration

If the selective outmigration of a large number of less Conscientious and Agreeable and more Neurotic Norse men

increased the mean level of happiness among Scandinavians left behind, it follows that wherever the surviving Viking men settled would have lower levels of happiness. Vikings settled in many places around the world, even as far away as Newfoundland (Kuitems et al., 2022), but one of the major settlements was in Russia.

The original inhabitants of present-day Russia were Vikings (Brink, 2008; Duczko, 2004; Shepard, 2008). The word “Rus” (for “Russia”) originally meant “people of Nordic stock” (Shepard, 1995, 2008, p. 497). If present-day Russians were descended from Vikings, then it follows that Russians are not only less happy for the same reason that Scandinavians are happier, but they are also less Conscientious and Agreeable and more Neurotic for the same reason that Scandinavians are the opposite.

According to the World Database of Happiness (2010–2018), Russia ranks 91st among 162 nations in the sample, with a mean happiness of 5.7 out of 10, below the world mean of 5.887. This is remarkable given Russia’s geographic proximity to Scandinavia. The average Russian is less happy than the average North Korean (5.9) or Rwandan (6.1), when both of these nations are much poorer than Russia, North Korea is a brutal dictatorship and Rwanda has a recent history of widespread and violent civil war.

Data from the Gosling-Potter Internet Personality Project once again confirm all of our predictions from SOPHy. Russians and Ukrainians (Ukraine’s present-day capital, Kiev, was the Vikings’ first settlement in the region, as well as Russia’s original capital; Duczko, 2004) are below the world’s mean in Conscientiousness and Agreeableness, and above the world’s mean in Neuroticism. Combined with the fact we discuss above that Scandinavians were

above average in Conscientiousness and Agreeableness and extremely low in Neuroticism, this is precisely the pattern we would expect if less Conscientious and Agreeable and more Neurotic Scandinavian men migrated out of Scandinavia as Vikings and some of them later settled in Ukraine and Russia. Thus, the immigration of Vikings into Ukraine and Russia might have left a genetic legacy on the happiness and personality profiles of their descendants just as much as their outmigration did on the happiness and personality profiles of Scandinavians left behind.

Very peculiarly, in the World Happiness Report data (2017–2019) (Halliwell et al., 2020), Russia ranks 73rd among 153 nations in average happiness, and its mean (5.546) is above the world's mean (5.473). However, anyone who is even remotely familiar with Russian people, culture, and language will find it impossible to believe that Russians are above the world's average in happiness (Balatsky & Diener, 1993; Eggers et al., 2006; Graham, 2009; Tucker et al., 2006; Wierzbicka, 1994). The World Happiness Report data are otherwise very highly correlated with the World Database of Happiness ($r = .850$, $\rho = .863$, $n = 149$, $p < .001$).

Sometimes other factors can contravene to mitigate the genetic legacy of Viking immigration and its negative effect on happiness in the region. For example, Kirkwall in Orkney and Stornoway in the Western Isles are two towns in Scotland that were both initially settled by Vikings a millennium ago. Yet, according to the UK Office of National Statistics data, Kirkwall and Stornoway tie as the happiest place to live in the UK, at least during the COVID-19 pandemic and among residents aged 65 and older (Armet, 2021). How could this be? The Western Isles and Orkney may have three factors that might mitigate the genetic legacy of Viking immigration. First, the Western Isles and Orkney are among the least densely populated areas in all of the UK (National Records of Scotland, 2018). Second, Orkney and, especially, the Western Isles are among the most religious and devoutly Christian regions in the otherwise largely secular Scotland; 45% of the residents in the Western Isles were regular churchgoers in 2016 (Brierley, 2017). Because ruralites are in general happier than urbanites (Li & Kanazawa, 2016) and more religious individuals are happier than less religious individuals (Bixter, 2015; Diener et al., 2011; Ellison, 1991; James & Wells, 2003; Kanazawa, 2015; Maltby et al., 1999, 2008), the lower population density and higher religiosity of Orkney and the Western Isles might have mitigated the genetic legacy of Viking immigration and its negative effect on happiness, allowing their residents to be the happiest in the UK despite it. Third, there are data that show that islanders may score higher on Conscientiousness than comparable populations on the mainland because individuals lower on Conscientiousness may leave the confined living of islands

(Camperio Ciani & Capiluppi, 2011). If this is true of the Western Isles and Orkney, their higher levels of Conscientiousness may contribute to their higher levels of happiness.

There are also empirical anomalies not explainable by SOPHy. For example, the Vikings hailed entirely from present-day Scandinavia (Sweden, Norway, Denmark), not from the Nordic countries (Finland, Iceland). In fact, as is evident from the copious literature on Icelandic sagas discussed above, many Vikings *settled* in Finland (partly on their way to Russia) and Iceland. Yet, today, Nordic countries enjoy as high levels of subjective well-being as Scandinavian countries do. Something other than SOPHy must therefore be operative to explain the high levels of Nordic happiness.

Potential Objections to the Use of International Personality Data

Our empirical support for SOPHy presented above relies heavily on the World Database of Happiness, the World Happiness Report, the Gosling-Potter Internet Personality Project, and other international data on subjective and self-described measures of happiness, Big Five personality factors, and other psychological traits. Some cross-cultural psychologists believe that one cannot draw valid conclusions from international comparisons of such subjective and self-described measures, because of cultural differences in reference groups and response styles (Heine et al., 2002; Minkov et al., 2019; Mõttus, Allik, et al., 2012; Mõttus et al., 2010; Triandis & Suh, 2002). On the other hand, a recent analysis of all relevant questions in the entire Wave 6 (2010–2012) of the World Values Survey shows that the extreme response bias is culturally universal and does not vary by culture (Kanazawa, 2018). At any rate, it is very important to emphasize that our empirical support for SOPHy presented above is only as valid as the underlying international data on happiness, Big Five personality factors, and other psychological traits.

Potential Counterexamples: What About Genghis Khan's Army? The Crusades? Australia?

The Viking Age was not the only period in history where a large number of individuals (usually men) known for their violent tendencies left their homelands. If such outmigration was not random with respect to personality – in particular, what modern personality psychologists call Conscientiousness, Agreeableness, and Neuroticism – then such large-scale outmigration could be expected to change

the distribution of happiness in their compatriots left behind. Did the level of happiness increase in their homelands after their outmigration? If not, what accounts for the difference? We consider three potential counterexamples to SOPHY: Genghis Khan's army, the Crusades, and the penal colony in Australia.

Genghis Khan's Army

Like the Vikings, Genghis Khan and his army were known for their murder, rape, pillage, and burn, so much so that 0.5% of all men living today in the entire world (and 8% of men in Asia) carry the Y-chromosomes of Genghis Khan and his male relatives (Zerjal et al., 2003). Their expeditions took the soldiers thousands of miles from their homeland of Mongolia, as Genghis Khan and his descendants boasted the largest empire in human history. However, Genghis Khan's army was different from the Vikings in a few crucial respects that made it not subject to selective outmigration by personality (or anything else).

First, there were only 129,000 men in Genghis Khan's army out of the total population of two million in Mongolia at the time (Onon, 2001, pp. 1-37). This translates into an outmigration rate of 6.45%, much smaller than the conservative estimate of 25% outmigration rate among Scandinavians during the Viking Age. Second, Genghis Khan's campaign of military conquests lasted only for 21 years (1206-1227), and was therefore over in a single generation. This is in sharp contrast to the 273 years of the Viking Age, comprising more than a dozen generations during which the effect of genetic selection was compounded generation after generation. There was no such compounding in Genghis Khan's army.

Finally, and most importantly, Genghis Khan instituted universal male conscription into his army (Onon, 2001, p. 10). "All male Mongol adults below the age of 60 were liable for military service. There was no such thing as a civilian" (Morgan, 2007, p. 75). "Initially, all recruitment to the Mongol armies was from within Mongol society. All males between the ages of 15 and 60 were liable for military service" (Turnbull, 2003, p. 10). Thus there was no selective outmigration by personality (or any other factor) in Genghis Khan's army. Today, according to the World Database of Happiness (2010-2018), the mean level of happiness in Mongolia is 5.2, slightly below the mean of 162 nations in the world.

The Crusades

The Crusades were another example of large-scale military expeditions with high mortality and eventual settlements of survivors in foreign lands. Just as Genghis Khan's army, however, the Crusades were also too small to have left

any genetic legacy by selective outmigration. The First Crusade (1095-1102) involved at most 100,000 individuals including non-combatants, attendants, women, and children, all of whom accompanied the knights who fought in the Crusades, principally from France, Flanders, Germany, and Italy (Runciman, 1951, pp. 336-341, Appendix 2). In the year 1000, shortly before the launch of the First Crusade, the population of France was estimated to have been 6.5 million, Belgium, .4 million, the Netherlands, .3 million, Germany, 3.5 million, and Italy, 5.0 million, for a total of 15.7 million (Avakov, 2010, pp. 9-11). It means that the 100,000 individuals who participated in the First Crusade accounted for only about 0.637% of the population of France, Flanders, Germany, and Italy at the time.

More importantly, individuals who participated in the Crusades were mostly motivated by their religious piety (Asbridge, 2004, pp. 70-76). After all, the Crusades were a religious war in defense of the holy land (Jerusalem) against followers of another religion (Islam). There is evidence, at least among modern populations, that religious individuals on average are happier than less religious individuals (Bixter, 2015; Diener et al., 2011; Ellison, 1991; James & Wells, 2003; Kanazawa, 2015; Maltby et al., 1999, 2008). If the positive association between religiosity and happiness held a millennium ago, during the times of the Crusades, then the Crusades had the opposite effect on the happiness of the Western Europeans to what the Viking Age did on that of Scandinavians. More religious – and therefore happier – individuals were more likely to join the Crusades, and either die or settle elsewhere, thereby *reducing*, not elevating, the mean level of happiness among their compatriots left behind (although the effect would have been minuscule given the small proportion of western Europeans who participated in the Crusades). We do note, however, that France and Italy, two wealthy democracies that nonetheless have relatively low levels of happiness, as pointed out by Proto and Oswald (2016), were major contributors to the Crusades' armies.

Australia

As is well-known, Australia began its European history as a penal colony. Between 1788 and 1868, 163,021 convicts were transported from Great Britain and Ireland to Australia. The population of the UK in 1820 was 19.831 million and of Ireland 5.053 million (for a total of 24.884 million) (Avakov, 2010, pp. 21-24). Thus, the exported convicts consisted of 0.655% of the total British and Irish populations at the time, the same minuscule portion as the Crusades' army from the Continent. Thus, the exported convicts were too few to have affected the distribution of personality in the UK and Ireland.

At the same time, however, recent genetic data show that 22% of living Australians are descendants of British and Irish convicts sent to the penal colonies in Australia (Australian Broadcasting Corporation, 2007). This is a substantial proportion of the Australian population today, yet Australia enjoys a relatively high level of mean happiness (40th among 162 nations in the World Database of Happiness). Why do Australians enjoy relatively high levels of happiness if a quarter of the population were descendants of convicted criminals?

As it turns out, most convicts sent to Australia were petty criminals, because more serious criminals, such as murderers and rapists, were punishable by death in Great Britain. Thus very few violent criminals ended up in Australia. Only 2% were guilty of serious crimes like murder and assault, and the vast majority – 87% of men and 91% of women – were convicted of minor offenses like petty theft (Australian Broadcasting Corporation, 2007). Thus, compared to violent criminals, they were not particularly low on Conscientiousness and Agreeableness and high on Neuroticism, making them unlikely to be particularly unhappy (although they might have *become* unhappy after they landed in the remote penal colony).

Other Potential Examples of SOPHy

Besides the emergence of Amish personality and Scandinavian happiness, there may be other examples of SOPHy. In particular, we suggest that the criterion of selective outmigration does not necessarily have to be personality per se. If selective outmigration happens by some trait, and if the trait is correlated with personality, then the outcome will be the same as if the selective outmigration was by personality. At the same time, “outmigration” from groups can also include deaths. We briefly discuss two such examples: The emigration of Japanese laterborns (birth order qua personality); and the Irish Potato Famine (occupation qua personality).

The Emigration of Japanese Laterborns (Birth Order Qua Personality)

The Japanese Civil Code, from 1898 to 1947, legally stipulated primogeniture and impartible inheritance (Hayami, 1983; Murakami, 1984). It means that, when a man died, all of his wealth and land were inherited by his eldest son, and neither his wife nor any of his younger sons (let alone daughters) inherited anything. The rule of primogeniture and impartible inheritance made it very difficult for laterborn sons to get an economic start in their lives, when the vast majority of the population were farmers in

pre-industrial Japan because it was very difficult to make a living as a farmer without any land. Thus the rule of primogeniture and impartible inheritance served as a strong impetus for laterborn sons to emigrate from Japan to other countries, to seek better economic and social opportunities in new lands (Neiwert, 2005, pp. 22–27).

There were 244,536 Japanese immigrants to Latin America in 1899–1941 (Kunimoto, 1993, p. 103, Table 4.3) and further 470,287 to North America and the rest of the world in 1894–1912 (Azuma, 2019, p. 64, Table 1). The population of Japan in 1890 was 40,077,000 (Avakov, 2010, pp. 31–33, Table 1.9). Thus the total number of immigrants (714,823) represented 1.78% of the Japanese population, or roughly 3.57% of the male population. The vast majority of the Japanese immigrants were laterborn sons, although they likely included some “picture brides” (Tanaka, 2004) of the male immigrants as well.

Compared to firstborns, laterborns tend to be more Open, less Conscientious, less Extraverted, more Agreeable, and less Neurotic (Sulloway, 1996, p. 73, Table 4). The birth order effect on personality is entirely environmental, via family socialization. As such, the personality differences by birth order are not heritable, as both firstborns and laterborns have firstborn and laterborn children when they become parents, and the birth order effect starts all over again with each generation. There are no such things as “firstborn genes” or “laterborn genes” inherited from generation to generation.

Under very limited circumstances, however, it is possible for the birth order effect to accumulate over generations (Sulloway, 1996). For example, under strict primogeniture and emigration of all laterborns, one would have to be the firstborn son of the firstborn son of the firstborn son to remain in the country. As a result, strict primogeniture and emigration of laterborns over many generations resulted in more and more of the Japanese male population being firstborn sons for several generations. Under such circumstances, it is not difficult to imagine that the typical personality traits of firstborns – less Open, more Conscientious, more Extraverted, less Agreeable, and more Neurotic – to become the national character, which might have also influenced the few laterborns that might have remained in the country.

Thus strict primogeniture and selective outmigration of laterborns should make the Japanese left behind – firstborn sons for many generations – less Open, more Conscientious, more Extraverted, less Agreeable, and more Neurotic. The Gosling-Potter Internet Personality Project data confirm two of these predictions. They show that, compared to the world mean, the Japanese are less Open, less Conscientious, less Extraverted, less Agreeable, and less Neurotic.

Schmitt et al.’s (2007) similar comparative data support three of the five predictions. They show that, compared

to Americans (the benchmark), the Japanese are less Open, less Conscientious, less Extraverted, less Agreeable, and more Neurotic. It is instructive to note, however, that Schmitt et al. (2007, pp. 206–207) themselves question their own findings that East Asians are less Conscientious than Americans. Their results show that Ethiopians, Tanzanians, and Zimbabweans are the most Conscientious, and Chinese, Koreans, and Japanese are the least Conscientious.

The Irish Potato Famine (Occupation Qua Personality)

The Irish Potato Famine began in 1845 when a fungus (*Phytophthora infestans*) spread throughout Ireland and decimated half of the potato crop (Kinealy, 2002). The crop failure for the next few years led to widespread hunger and resulted in roughly one million deaths and emigration of another million, mostly to the United States. (From 1841 to 1850, roughly half of the immigrants to the United States were Irish.) The population of Ireland declined from 8.4 million in 1844 to 6.6 million in 1851, a 21.4% decline. This is a significant decline in population, and a strong candidate for SOPHy if the deaths and emigration were somehow connected to personality.

Naturally, given the cause and nature of the famine, a vast majority of the dead and the emigrants were farmers (Kinealy, 2002). There is a reciprocal causal relationship between occupation and personality (Kohn & Schooler, 1983): Individuals with certain personality traits are more likely to choose certain occupations, and holding certain occupations molds the occupants' personality. Some studies show that farmers tend to be more Open, less Extraverted, and less Agreeable (Downey & Spaulding, 2018; Kern et al., 2019). The deaths and selective outmigration of more Open, less Extraverted, and less Agreeable potato farmers from Ireland on a massive scale, reducing the Irish population by more than a fifth, should make the Irish population left behind less Open, more Extraverted, and more Agreeable. The Gosling-Potter Internet Personality Project data indeed show that, compared to the world mean, the Irish are less Open, more Extraverted, and more Agreeable. Boski (2013) also shows that the Irish are less Open, more Extraverted, and more Agreeable than Poles.

Empirical Implications

Our calculations above showed that, under reasonable assumptions that Scandinavians in 793 were at least at about the world's average in happiness, outmigration of less Conscientious and Agreeable and more Neurotic men as

Vikings *could have* produced the genetic advantage that Scandinavians currently enjoy in happiness. However, this is different from actual empirical evidence that *it did* happen. Our hypothesis awaits future empirical tests.

One such empirical test could be molecular genetic. Because the Y-chromosome is transmitted only from father to son, and because mtDNA is transmitted only through the maternal lines, we can identify individuals currently living anywhere in the world who can trace their ancestry to Scandinavian men and women (those individuals carrying the characteristic Scandinavian Y-chromosomes and mtDNA). One prediction derived from SOPHy is that, compared to Scandinavian men who currently reside in Scandinavia and whose ancestors have always remained in Scandinavia throughout the last millennium, men who carry a Scandinavian Y-chromosome but currently reside outside of Scandinavia (such as Iceland, the British Isles, and Russia) and whose ancestors have resided outside of Scandinavia during the last millennium should be more likely to carry genes that incline them to lower levels of happiness, such as the short allele of the 5-HTTLPR gene. Second, Scandinavian men currently residing outside of Scandinavia (and whose ancestors have done so for the last millennium) who carry a Scandinavian Y-chromosome *and* a Scandinavian mtDNA should be more likely to carry genes that incline them to lower levels of happiness than Scandinavian men who carry a non-Scandinavian Y-chromosome *and* a Scandinavian mtDNA, because the latter are descended strictly from Scandinavian women (who were unlikely to have been Vikings), not Scandinavian men (who were more likely to have been Vikings than Scandinavian women were). The second prediction roughly translates into a more cultural version, which states that Scandinavian men outside of Scandinavia who have stereotypically Scandinavian surnames are more likely to carry genes that incline them to lower levels of happiness than comparable Scandinavian men who do not have such surnames, although it is likely that the latter category of men no longer identifies culturally as Scandinavian due to their surnames. In general, outside of Scandinavia and among individuals whose ancestors have resided outside of Scandinavia for the last millennium, a Scandinavian Y-chromosome should be a stronger predictor of (lower levels of) happiness than a Scandinavian mtDNA is.

Other types of evidence can come from population genomics and genetic archeology but awaits and anticipates future developments in the genetics of personality. If and when certain genes are identified as strongly associated with the Big Five personality factors, in particular, Conscientiousness, Agreeableness, and Neuroticism, then the population genomics of the Viking world (Margaryan et al., 2020) should reveal that genomes of the Vikings buried outside of Scandinavia around the world should

contain genes that inline them to lower Conscientiousness, lower Agreeableness, and higher Neuroticism than those of the bodies of their contemporaries buried in Scandinavia.

One implication of our hypothesis unlikely to be shared by other explanations – although, we hasten to add, *none currently exist* – is that Scandinavians *have been* the happiest people on earth *for the past millennium*. According to our hypothesis, it is not a recent phenomenon. If our hypothesis is correct, then Scandinavians were already the happiest people on earth in 1066, and there have not been counter-vailing selection forces during the past millennium to reduce the mean level of happiness in Scandinavia.

Future studies, necessarily relying on archeological, historical, or molecular genetic data, can either confirm or refute this prediction from our hypothesis. However, given that Proto and Oswald (2016) very convincingly demonstrate that the proximate cause of the Scandinavian advantage in happiness is genetic and that genetic changes happen very slowly, it is unlikely that the current Scandinavian advantage in happiness is of recent origin. We invite and welcome archeologists, historians, and molecular geneticists to bring necessary evidence to bear either to confirm or refute our hypothesis.

References

- Anglim, J., Horwood, S., Smillie, L. D., Marrero, R. J., & Wood, J. K. (2020). Predicting psychological and subjective well-being from personality: A meta-analysis. *Psychological Bulletin*, 146(4), 279–323. <https://doi.org/10.1037/bul0000226>
- Armet, H. (2021, January 23). Happiest places to live. *The Orkney News*. <https://theorkneynews.scot/2021/01/23/happiest-places-to-live/>
- Asbridge, T. (2004). *The first Crusade: A new history*. Free Press.
- Australian Broadcasting Corporation. (2007). *Online records highlight Australia's convict past*. <https://www.abc.net.au/news/2007-07-25/online-records-highlight-australias-convict-past/2512534>
- Avakov, A. V. (2010). *Two thousand years of economic statistics: Population, GDP at PPP, and GDP per capita, years 1 to 2012. Volume 1: By rank*. Algora.
- Azuma, E. (2019). *In search of our frontier: Japanese America and settler colonialism in the construction of Japan's borderless empire*. University of California Press.
- Balatsky, G., & Diener, E. (1993). Subjective well-being among Russian students. *Social Indicators Research*, 28(3), 225–243.
- Bar, A., & Otterbring, T. (2021). The role of culture and personality traits in board game habits and attitudes: Cross-cultural comparisons between Denmark, Germany, and USA. *Journal of Retailing and Consumer Services*, 61, Article 102506.
- Barrett, J. H. (2008). What caused the Viking age? *Antiquity*, 82(317), 671–685.
- Bixter, M. T. (2015). Happiness, political orientation, and religiosity. *Personality and Individual Differences*, 72(1), 7–11. <https://doi.org/10.1016/j.paid.2014.08.010>
- Boski, P. (2013). A psychology of economic migration. *Journal of Cross-Cultural Psychology*, 44(7), 1067–1093. <https://doi.org/10.1177/0022022112471895>
- Brands, H. W. (2002). *The age of gold: The California Gold Rush and the new American dream*. Anchor.
- Brierley, P. (2017). *The Fourth Scottish Church Census*. Brierley Consultancy.
- Brink, S. (2008). Who were the Vikings?? In S. Brink & N. Price (Eds.), *The Viking world* (pp. 4–7). Routledge.
- Camperio Ciani, A., & Capiluppi, C. (2011). Gene flow by selective emigration as a possible cause for personality differences between small islands and mainland populations. *European Journal of Personality*, 25(1), 53–64. <https://doi.org/10.1002/per.774>
- Caspi, A., Sugden, K., Moffitt, E. E., Taylor, A., Craig, I. W., Harrington, H., McClay, J., Mill, J., Martin, J., & Braithwaite, A. (2003). Influence of life stress on depression: Moderation by a polymorphism in the 5-HTT gene. *Science*, 301(5631), 386–389.
- Chagnon, N. A. (2013). *Yanomamó* (6th ed.). Wadsworth.
- Clover, C. J. (1988). The politics of scarcity: Notes on the sex ratio in early Scandinavia. *Scandinavian Studies*, 60(2), 147–188.
- Collins, J. M., & Schmidt, F. L. (1993). Personality, integrity, and white collar crime: A construct validity study. *Personnel Psychology*, 46(2), 295–311.
- DeNeve, K. M., & Cooper, H. (1998). The happy personality: A meta-analysis of 137 personality traits and subjective well-being. *Psychological Bulletin*, 124(2), 197–229.
- Diener, E., Diener, M., & Diener, C. (1995). Factors predicting the subjective well-being of nations. *Journal of Personality and Social Psychology*, 69(5), 851–864.
- Diener, E., Tay, L., & Myers, D. G. (2011). The religion paradox: If religion makes people happy, why are so many dropping out? *Journal of Personality and Social Psychology*, 101(6), 1278–1290. <https://doi.org/10.1037/a0024402>
- Dommasnes, L. H. (1982). Late Iron Age in western Norway. *Female roles and ranks as deduced from an analysis of burial costumes*. *Norwegian Archeological Review*, 15(1–2), 70–84.
- Downey, S., & Spaulding, A. (2018, September 18). Personality traits of American farmers. *Successful Farming*. <https://www.agriculture.com/family/personality-traits-of-american-farmers>
- Duczko, W. (2004). *Viking Rus: Studies on the presence of Scandinavians in Eastern Europe*. Brill.
- Dumville, D. N. (2008). Vikings in insular chronicling. In S. Brink & N. Price (Eds.), *The Viking world* (pp. 350–367). Routledge.
- Eggers, A., Gaddy, C., & Graham, C. (2006). Well-being and unemployment in Russia in the 1990s: Can society's suffering be individuals' solace? *Journal of Socio-Economics*, 35(2), 209–242. <https://doi.org/10.1016/j.soec.2005.11.059>
- Ellison, C. G. (1991). Religious involvement and subjective well-being. *Journal of Health and Social Behavior*, 32(1), 80–99.
- Eriksson, T. G., Masche-No, J. G., & Dåderman, A. M. (2017). Personality traits of prisoners as compared to general populations: Signs of adjustment to the situation. *Personality and Individual Differences*, 107, 237–245. <https://doi.org/10.1016/j.paid.2016.11.030>
- Gebauer, J. E., Sedikides, C., Wagner, J., Bleidorn, W., Rentfrow, P. J., Potter, J., & Gosling, S. D. (2015). Cultural norm fulfillment, interpersonal belonging, or getting ahead? A large-scale cross-cultural test of three perspectives on the function of self-esteem. *Journal of Personality and Social Psychology*, 109(3), 526–548. <https://doi.org/10.1037/pspp0000052>
- Geijer, E. G. (1896). The Viking. *Progress*, 2, 339–340.
- Graham, C. (2009). *Happiness around the world: The paradox of happy peasants and miserable millionaires*. Oxford University Press.
- Halliwell, J. F., Layard, R., Sachs, J. D., & De Neve, J.-E. (Eds.). (2020). *World happiness report 2020*. Sustainable Development Solutions Network.

- Harris, J. R. (1995). Where is the child's environment? A group socialization theory of development. *Psychological Review*, 102(3), 458–489.
- Harris, J. R. (1998). *The nurture assumption: Why children turn out the way they do*. Free Press.
- Hayami, A. (1983). The myth of primogeniture and impartible inheritance in Tokugawa Japan. *Journal of Family History*, 8(1), 3–29.
- Heine, S. J., Lehman, D. R., Peng, K., & Greenholtz, J. (2002). What's wrong with cross-cultural comparisons of subjective Likert scales? The reference-group effect. *Journal of Personality and Social Psychology*, 82(6), 903–918. <https://doi.org/10.1037/0022-3514.82.6.903>
- Helgason, A., Sigurðardóttir, S., Nicholson, J., Sykes, B., Hill, E. W., Bradley, D. G., Bosnes, V., Gulcher, J. R., Ward, R., & Stefánsson, K. (2000). Estimating Scandinavian and Gaelic ancestry in the male settlers of Iceland. *American Journal of Human Genetics*, 67(3), 697–717.
- Helgason, A., Hickey, E., Goodacre, S., Bosnes, V., Stefánsson, K., Ward, R., & Sykes, B. (2001). mtDNA and the Islands of the North Atlantic: Estimating the proportions of Norse and Gaelic ancestry. *American Journal of Human Genetics*, 68(3), 723–737.
- Hostetler, J. A. (2013). *The Amish*. Herald Press.
- Hostetler, J. A., & Huntington, G. E. (1967). *The Hutterites in North America*. Holt, Rinehart and Winston.
- Inglehart, R. F., Borinskaya, S., Cotter, A., Harro, J., Inglehart, R. C., Ponarin, E., & Welzel, C. (2014). Genetic factors, cultural predispositions, happiness and gender equality. *Journal of Research in Gender Studies*, 4(1), 32–100.
- Jackson, C. L., Colquitt, J. A., Wesson, M. J., & Zapata-Phelan, C. P. (2006). Psychological collectivism: A measurement validation and linkage to group member performance. *Journal of Applied Psychology*, 91(4), 884–899. <https://doi.org/10.1037/0021-9010.91.4.884>
- James, A., & Wells, A. (2003). Religion and mental health: Towards a cognitive-behavioural framework. *British Journal of Health Psychology*, 8(3), 359–376.
- Jesch, J. (1991). *Women in the Viking Age*. Boydell.
- Jesch, J. (2015). *The Viking diaspora*. Routledge.
- Johnson, A. C., & Thomopoulos, N. T. (2002). Characteristics and tables of the left-truncated normal distribution. *Proceedings of the Midwest Decision Sciences Institute*, 133–139.
- Jokela, M. (2011). Personality traits and reasons for residential mobility: Longitudinal data from United Kingdom, Germany, and Australia. *Personality and Individual Differences*, 180, Article 110978. <https://doi.org/10.1016/j.paid.2021.110978>
- Jones, S. E., Miller, J. D., & Lynam, D. R. (2011). Personality, antisocial behavior, and aggression: A meta-analytic review. *Journal of Criminal Justice*, 39(4), 329–337. <https://doi.org/10.1016/j.jcrimjus.2011.03.004>
- Kanazawa, S. (2009). Evolutionary psychological foundations of civil wars. *Journal of Politics*, 71(1), 25–34.
- Kanazawa, S. (2012). *The intelligence paradox: Why the intelligent choice isn't always the smart one*. Wiley.
- Kanazawa, S. (2015). Where do Gods come from? *Psychology of Religion and Spirituality*, 7(4), 306–313. <https://doi.org/10.1037/rel0000033>
- Kanazawa, S. (2018). Darling I don't know why I go to extremes: A seemingly culturally universal and potentially evolved human tendency to hold extreme preferences and values. *Biodemography and Social Biology*, 64(2), 114–122. <https://doi.org/10.1080/19485565.2018.1490884>
- Kanazawa, S., & Li, N. P. (2015). Happiness in modern society: Why intelligence and ethnic composition matter. *Journal of Research in Personality*, 59, 111–120.
- Kern, M. L., McCarthy, P. X., Chakrabarty, D., & Rizoio, M.-A. (2019). Social media-predicted personality traits and values can help match people to their jobs. *Proceedings of the National Academy of Sciences*, 116(52), 26459–26464. <https://doi.org/10.1073/pnas.1917942116>
- Keynes, S. (1997). The Vikings in England, c. 790–1016. In P. Sawyer (Ed.), *The Oxford illustrated history of the Viking* (pp. 48–82). Oxford University Press.
- Kinealy, C. (2002). *The Great Irish Famine: Impact, ideology and rebellion*. Palgrave.
- Knudsen, A. S. B. (2022). *Those who stayed: Selection and cultural change in the age of mass migration*. Department of Economics, University of Copenhagen.
- Kohn, M. L., & Schooler, C. (1983). Job conditions and personality: A longitudinal assessment of their reciprocal effects. *American Journal of Sociology*, 87(6), 1257–1286.
- Krueger, R. F., & Johnson, W. (2008). Behavioral genetics and personality: A new look at the integration of nature and nurture. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (3rd ed., pp. 287–310). Guilford Press.
- Kunimoto, I. (1993). Japanese migration to Latin America. In B. Stallings & G. Székely (Eds.), *Japan, the United States, and Latin America: Towards a trilateral relationship in the western hemisphere?* (pp. 99–121). Macmillan.
- Kuitens, M., Wallace, B. L., Lindsay, C., Scifo, A., Doeve, P., Jenkins, K., Lindauer, S., Erdil, P., Ledger, P. M., Forbes, V., Vermeeren, C., Friedrich, R., & Dee, M. W. (2022). Evidence for European presence in the Americas in AD 1021. *Nature*, 61(7893), 388–391. <https://doi.org/10.1038/s41586-021-03972-8>
- Li, N. P., & Kanazawa, S. (2016). Country roads, take me home... to my friends: How intelligence, population density, and friendship affect modern happiness. *British Journal of Psychology*, 107(4), 675–697.
- Maltby, J., Lewis, C. A., & Day, L. (1999). Religious orientation and psychological well-being: The role of the frequency of personal prayer. *British Journal of Health Psychology*, 4(4), 363–378.
- Maltby, J., Lewis, C. A., & Day, L. (2008). Prayer and subjective wellbeing: The application of a cognitive-behavioural framework. *Mental Health, Religion & Culture*, 11(1), 119–129.
- Margaryan, A., Lawson, D. J., Sikora, M., Racimo, F., Rasmussen, S., Moltke, I., Cassidy, L. M., Jørsboe, E., Ingason, A., Pedersen, M. W., Korneliussen, T., Wilhelmson, H., Buš, M. M., de Barrs Damgaard, P., Martiniano, R., Renaud, G., Bhérer, C. J., Moreno-Mayar, C. V., Fotakis, A. K., ... Willerslev, E. (2020). Population genomics of the Viking world. *Nature*, 585(7825), 390–396. <https://doi.org/10.1038/s41586-020-2688-8>
- McCrae, R. R., & Costa, P. T. Jr. (2008). The five-factor theory of personality. In O. P. John, R. W. Robins, & L. A. Pervin (Eds.), *Handbook of personality: Theory and research* (3rd ed., pp. 159–181). Guilford Press.
- Miller, J. D., & Lynam, D. (2001). Structural models of personality and their relation to antisocial behavior: A meta-analytic review. *Criminology*, 39(4), 765–798.
- Minkov, M., & Bond, M. H. (2017). A genetic component to national differences in happiness. *Journal of Happiness Studies*, 18(2), 321–340. <https://doi.org/10.1007/s10902-015-9712-y>
- Minkov, M., van de Vijver, F. J. R., & Schachner, M. (2019). A test of a new short Big-Five tool in large probabilistic samples from 19 countries. *Personality and Individual Differences*, 151, Article 109519. <https://doi.org/10.1016/j.paid.2019.109519>
- Morgan, D. (2007). *The Mongol* (2nd ed.). Blackwell.
- Möttus, R., Allik, J., & Realo, A. (2010). An attempt to validate national mean scores of Conscientiousness: No necessarily paradoxical findings. *Journal of Research in Personality*, 44(5), 630–640. <https://doi.org/10.1016/j.jrp.2010.08.005>

- Möttus, R., Allik, J., Realo, A., Rossier, J., Zecca, G., Ah-Kion, J., Amoussou-Yéyé, D., Bäckström, M., Barkauskiene, R., Barry, O., Bhowon, U., Björklund, F., Bochaver, A., Bochaver, K., de Bruin, G., Cabrera, H. F., Chen, S. X., Church, A. T., Cissé, D. D., ... Johnson, W. (2012). The effect of response style on self-reported conscientiousness across 20 countries. *Personality and Social Psychology Bulletin*, 38(11), 1423–1436. <https://doi.org/10.1177/0146167212451275>
- Möttus, R., Guljajev, J., Allik, J., Laidra, K., & Pullmann, H. (2012). Longitudinal associations of cognitive ability, personality traits and school grades with antisocial behaviour. *European Journal of Personality*, 26(1), 56–62. <https://doi.org/10.1002/per.820>
- Murakami, Y. (1984). The society as a pattern of civilization. *Journal of Japanese Studies*, 10(2), 281–363.
- National Records of Scotland. (2018). *Population estimates for settlements and localities in Scotland, mid-2016*. National Records of Scotland.
- Nei, M. (1972). Genetic distance between populations. *American Naturalist*, 106(949), 283–292.
- Neiwert, D. (2005). *Strawberry days: How internment destroyed a Japanese American community*. Palgrave.
- Nelson, J. L. (1997). The Frankish Empire. In P. Sawyer (Ed.), *The Oxford illustrated history of the Viking* (pp. 19–47). Oxford University Press.
- Ó Corráin, D. (1997). Ireland, Wales, Man, and the Hebrides. In P. Sawyer (Ed.), *The Oxford illustrated history of the Viking* (pp. 83–109). Oxford University Press.
- Ó Corráin, D. (2008). The Vikings and Ireland. In S. Brink & N. Price (Eds.), *The Viking world* (pp. 428–433). Routledge.
- Onon, U. (2001). *The secret history of the Mongols: The life and times of Chinggis Khan*. Routledge.
- O’Riordan, C., & O’Connell, M. (2014). Predicting adult involvement in crime: Personality measures are significant, socio-economic measures are not. *Personality and Individual Differences*, 68, 98–101. <https://doi.org/10.1016/j.paid.2014.04.010>
- Ortiz-Tallo, M., Cardenal, V., Blanca, M. J., Sánchez, L. M., & Morales, I. (2007). Multiaxial evaluation of violent criminals. *Psychological Reports*, 100(3 Supplement), 1065–1075. <https://doi.org/10.2466/PRO.100.4.1065-1075>
- Özdemir, S., Kahraman, S., & Ertufan, H. (2021). Comparison of death anxiety, self-esteem, and personality traits of the people who live in Turkey and Denmark. *OMEGA – Journal of Death and Dying*, 84(2), 360–377. <https://doi.org/10.1177/0030222819885781>
- Preheim, R. (2017). *The “Anabaptists” who weren’t*. Anabaptist World. <https://anabaptistworld.org/history-the-anabaptists-who-werent/>
- Proto, E., & Oswald, A. J. (2016). National happiness and genetic distance: A cautious exploration. *Economic Journal*, 127(604), 2127–2152. <https://doi.org/10.1111/eoj.12383>
- Raffield, B. (2019). Playing Viking: Militarism, hegemonic masculinities, and childhood enculturation in Viking Age Scandinavia. *Current Anthropology*, 60(6), 813–835. <https://doi.org/10.1086/706608>
- Raffield, B., Greenlow, C., Price, N., & Collard, M. (2016). Ingroup identification, identity fusion and the formation of Viking war bands. *World Archaeology*, 48(1), 35–50. <https://doi.org/10.1080/00438243.2015.1100548>
- Raffield, B., Price, N., & Collard, M. (2017). Male-biased operational sex ratios and the Viking phenomenon: An evolutionary anthropological perspective on Late Iron Age Scandinavian raiding. *Evolution and Human Behavior*, 38(3), 315–324. <https://doi.org/10.1016/j.evolhumbehav.2016.10.013>
- Rentfrow, P. J., Gosling, S. D., & Potter, J. (2008). A theory of the emergence, persistence, and expression of geographic variation in psychological characteristics. *Perspectives on Psychological Science*, 3(5), 339–369.
- Runciman, S. (1951). *A history of the Crusades. Volume 1. The first Crusade and the foundation of the Kingdom of Jerusalem*. Cambridge University Press.
- Schmitt, D. P., Allik, J., McCrae, R. R., Benet-Martínez, V., Alcalay, L., Ault, L., Austers, I., Bennett, K. L., Bianchi, G., Boholst, F., Borg Cunen, M. A., Braeckman, J., Brainerd, E. G. Jr., Caral, L. G. A., Caron, G., Casullo, M. M., Cunningham, M., Daibo, I., De Backer, C., ... Zupanèè, A. (2007). The geographic distribution of Big Five personality traits: Patterns and profiles of human self-description across 56 nations. *Journal of Cross-Cultural Psychology*, 38(2), 173–212.
- Shepard, J. (1995). The Rhos guests of Louis the Pious: Whence and wherefore? *Early Medieval Europe*, 4(1), 41–60.
- Shepard, J. (2008). The Viking Rus and Byzantium. In S. Brink & N. Price (Eds.), *The Viking world* (pp. 496–516). Routledge.
- Shimotsukasa, T., Ohio, A., Tani, M., & Yamaki, M. (2019). Big Five personality traits in inmates and normal adults in Japan. *Personality and Individual Differences*, 141, 81–85. <https://doi.org/10.1016/j.paid.2018.12.018>
- Sulloway, F. (1996). *Born to rebel: Birth order, family dynamics, and creative lives*. Pantheon.
- Tanaka, K. (2004). Japanese picture marriage and the image of immigrant women in early twentieth-century California. *Japanese Journal of American Studies*, 15, 115–138.
- Thiry, B. (2012). An assessment of personality disorders with the Five-Factor Model among Belgian inmates. *International Journal of Law and Psychiatry*, 35(4), 327–333. <https://doi.org/10.1016/j.ijlp.2012.04.010>
- Triandis, H. C., & Suh, E. M. (2002). Cultural influences on personality. *Annual Review of Psychology*, 53, 133–160.
- Tucker, K. L., Ozer, D. J., Lyubomirsky, S., & Boehm, J. K. (2006). Testing for measurement invariance in the Satisfaction With Life Scale: A comparison of Russians and North Americans. *Social Indicators Research*, 78(2), 341–360. <https://doi.org/10.1007/s11205-005-1037-5>
- Turnbull, S. (2003). *Mongol warrior 1200–1350*. Osprey.
- van Braght, T. J. (1987). *Martyrs’ mirror*. Herald Press.
- Waxman, Z. (2004). Testimony and representation. In D. Stone (Ed.), *The historiography of the Holocaust* (pp. 487–507). Palgrave.
- Weight, M. D., & Harpending, H. (2017). Some uses of models of quantitative genetic selection in social science. *Journal of Biosocial Science*, 49(1), 15–30. <https://doi.org/10.1017/S002193201600002X>
- Wierzbicka, A. (1994). Emotion, language, and cultural scripts. In S. Kitayama & H. R. Markus (Eds.), *Empirical studies of mutual influence* (pp. 133–196). American Psychological Association.
- Williams, G. (2008). Raiding and warfare. In S. Brink & N. Price (Eds.), *The Viking world* (pp. 193–203). Routledge.
- Wittmer, J. (1970). Homogeneity of personality characteristics: A comparison between old order Amish and non-Amish. *American Anthropologist*, 72(5), 1063–1068.
- Wolf, K., & Mueller-Vollmer, T. (2018). *The Vikings: Facts and fictions*. ABC-CLIO.
- Zerjal, T., Xue, Y., Bertorelle, G., Wells, R. S., Bao, W., Zhu, S., Qamar, R., Ayub, Q., Mohyuddin, A., Fu, S., Li, P., Yuldasheva, N., Ruzibakiev, R., Xu, J., Shu, Q., Du, R., Yang, H., Hurles, M. E., Robinson, E., ... Tyler-Smith, C. (2003). The genetic legacy of the Mongols. *American Journal of Human Genetics*, 72(3), 717–721.

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Conflict of Interest

The authors confirm that there is no conflict of interest to declare.

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Appendix A

Detailed Calculations: World Database of Happiness

0. Preliminaries

0.1. Outmigration Rate

According to Dommasnes (1982, p. 82, Table III), the sex ratio in Norway before the Viking Age (793–1066) varied from 1.7:1.0 in 7th century Nordland to 20:1 in 8th century Gloppen. If we take the most conservative estimate of 1.7:1, it implies that 41% of young men were mateless ($1.0/1.7 = .5882$). We therefore estimate that about 40% of young men became Vikings, left Scandinavia on their Viking expeditions, and never returned. This would translate to about 25% outmigration per generation ($.4/(1.0 + .06) = .25$). Note that 40% of women would have been eliminated by female infanticide.

0.2. Genetic Selection for SQ (Scandinavian Quotient = Happiness)

According to David Lane's applet (https://davidmlane.com/hyperstat/z_table.html), z associated with an area of .25 at the left end of a standard normal curve is $z = -.674$.

According to Johnson and Thomopoulos (2002, Table 1), and using ($K_L = -.8$) for a very conservative approximation for $-.674$ without linear interpolation ($K_L = -.8$ corresponds

to the outmigration rate of .212 rather than .250), the mean of the left-truncated standard normal distribution is ($1.1676 - .8 = .3676$), hence the mean increases by .3676 SD units per generation in Scandinavia.

Following Weight and Harpending (2017) and Kanazawa (2012, pp. 45–47), we posit an SQ heritability of $h^2 = .50$. Assuming random mating among the remaining Scandinavians with regard to SQ, each generation of Scandinavians will have $(.3676 \times .5 = .1838)$ SD unit higher SQ than the previous generation.

0.3. Current Levels of Happiness

According to Ruut Veenhoven's World Database of Happiness (2010–2018) (https://worlddatabaseofhappiness.eur.nl/hap_nat/nat_fp.php?mode=8&ranks=1), the mean happiness, on a scale of 0–10, is:

Whole world ($n = 162$)

$M = 5.887$

$SD = 1.260$

Denmark: $M = 8.3$

Norway: $M = 8.0$

Sweden: $M = 7.8$

Germany: $M = 7.3$

UK: $M = 7.3$

Central African Republic/South Sudan/Togo: $M = 3.4$

(The lowest mean in the world)

1. Question 1. How Long Does It Take for Scandinavia to Achieve Its Current Advantage in Happiness?

1.1. Scenario 1: Mean Happiness in Scandinavia at the Dawn of the Viking Age Was the Same as in Germany and the UK

The difference from Denmark in *SD* units:

$$(8.3 - 7.3)/1.260 = .794$$

Scandinavians increased *SQ* by .1838 *SD* units per generation. Thus, in order for Danes to create their current advantage over Germans and Brits, it would take $.794/.1838 = 4.32$ generations.

According to Geijer (1896), young Norse men typically started their careers as Vikings around age 15 and settled down with family by age 20. Thus the generation time for Vikings was probably about 20 years. It would therefore take $20 \times 4.32 = 86.4$ years for Danes to achieve the current advantage in happiness over Germans and Brits.

According to Brink (2008, p. 5), Jesch (1991, pp. 1–8), and Wolf and Mueller-Vollmer (2018, pp. ix–xiii), the Viking Age lasted for 273 years or 13.65 generations (793–1066). So it would be possible for Danes to have gained their current advantage in happiness over Germans and Brits during the Viking Age.

1.2. Scenario 2: Mean Happiness in Scandinavia at the Dawn of the Viking Age Was the Same as the World Mean

The difference from Denmark in *SD* units:

$$(8.3 - 5.887)/1.260 = 1.915$$

In order for Danes to create their current advantage over the rest of the world, it would take $1.915/.1838 = 10.419$ generations, or $20 \times 10.419 = 208.38$ years.

It would be possible for Danes to have gained their current advantage in happiness over the rest of the world during the Viking Age.

1.3. Scenario 3: Mean Happiness in Scandinavia at the Dawn of the Viking Age was the Lowest in the World (Comparable to Central African Republic/South Sudan/Togo Today)

The difference from Denmark in *SD* units:

$$(8.3 - 3.4)/1.260 = 3.889$$

In order for Danes to create their current advantage over Central African Republic/South Sudan/Togo today, it would take $3.889/.1838 = 21.159$ generations, or $20 \times 21.159 = 423.18$ years.

It would therefore *not* be possible for Danes to have gained their current advantage over Central African Republic/South Sudan/Togo today during the Viking Age.

2. Question 2: How Large Does the Outmigration Have to Be During the Viking Age for Scandinavia to Gain Its Current Advantage in Happiness?

2.1. Scenario 1: Mean Happiness in Scandinavia at the Dawn of the Viking Age was the Same as in Germany and the UK

The Viking Age (793–1066) = 273 years/13.65 generations.

$$.794/x = 13.65$$

$$x = .794/13.65 = .0582$$

Danes would have to increase their *SQ* by .0582 *SD* units per generation to achieve their current advantage over Germany/UK in 273 years/13.65 generations.

Given the heritability of *SQ* $h^2 = .5$, the outmigration rate would have to be such that the *SQ* would increase $.0582/.5 = .1164$.

According to Johnson and Thomopoulos (2002, Table 1), if $K_L = -1.6$, the mean of the left-truncated standard normal distribution would be $1.7174 - 1.6 = .1174$.

According to David Lane's applet (https://davidmlane.com/hyperstat/z_table.html), $z = -1.6$ corresponds to .0548.

In order for Denmark to achieve its current advantage in *SQ* over Germany/UK in 13.65 generations, the outmigration rate per generation would have to be .0548, which means that about 10% of Scandinavian men would have to be mateless, engage in Viking activities and never return to Scandinavia ($10/(100 + 90) = .0526$). This is equivalent to saying that 10% of girls were eliminated by female infanticide.

This figure is consistent with the common view among historians and Viking experts that only a minority of Scandinavian men engaged in Viking activities (Williams, 2008; Wolf & Mueller-Vollmer, 2018, pp. 25–36).

2.2. Scenario 2: Mean Happiness in Scandinavia at the Dawn of the Viking Age was the Same as the World Mean

$$1.915/x = 13.65$$

$$x = 1.915/13.65 = .1403$$

Danes would have to increase their *SQ* by .1403 *SD* units per generation to achieve their current advantage over the whole world in 273 years/13.65 generations.

Given the heritability of *SQ* $h^2 = .5$, the outmigration rate would have to be such that the *SQ* would increase $.1403/.5 = .2806$.

According to Johnson and Thomopoulos (2002, Table 1), if $K_L = -1.0$, the mean of the left-truncated standard normal distribution would be $1.2876 - 1.0 = .2876$.

According to David Lane's applet (https://davidmlane.com/hyperstat/z_table.html), $z = -1.0$ corresponds to .1587.

In order for Denmark to achieve its current advantage in SQ over the rest of the world in 13.65 generations, the outmigration rate per generation would have to be .1587, which means that about 27% of Scandinavian men would have to be mateless, engage in Viking activities and never return to Scandinavia ($27/(100 + 73) = .1561$). This is equivalent to saying that 27% of girls were eliminated by female infanticide.

This figure is consistent with the common view among historians and Viking experts that only a minority of Scandinavian men engaged in Viking activities (Williams, 2008; Wolf & Mueller-Vollmer, 2018, pp. 25–36).

2.3. Scenario 3: Mean Happiness in Scandinavia at the Dawn of the Viking Age was the Lowest in the World (Comparable to Central African Republic/South Sudan/Togo Today)

$$3.889/x = 13.65$$

$$x = 3.889/13.65 = .2849$$

Danes would have to increase their SQ by .2849 SD units per generation to achieve their current advantage over Central African Republic/South Sudan/Togo in 273 years/13.65 generations.

Given the heritability of SQ $h^2 = .5$, the outmigration rate would have to be such that the SQ would increase $.2849/.5 = .5698$.

According to Johnson and Thomopoulos (2002, Table 1), if $K_L = -.4$, the mean of the left-truncated standard normal distribution would be $.9619 - .4 = .5619$.

According to David Lane's applet (https://davidmlane.com/hyperstat/z_table.html), $z = -.4$ corresponds to .3446.

In order for Denmark to achieve its current advantage in SQ over Central African Republic/South Sudan/Togo in 13.65 generations, the outmigration rate per generation would have to be .3446, which means that about 51% of Scandinavian men would have to be mateless, engage in Viking activities and never return to Scandinavia ($51/(100 + 49) = .3423$). This is equivalent to saying that 51% of girls were eliminated by female infanticide. This seems like an implausibly high number, as all Vikings experts agree that only a minority of Scandinavian men engaged in Viking activities.

However, we nonetheless note that, *even if Scandinavians were the unhappiest people on earth in 793*, they could still come out the happiest people on earth in 1066 *if half of Norse men became Vikings*.

Appendix B

Detailed Calculations: World Happiness Report

0. Preliminaries.

0.1. Outmigration Rate

See Appendix A.

0.2. Genetic Selection for SQ (Scandinavian Quotient = Happiness)

See Appendix A.

0.3. Current Levels of Happiness

According to the World Happiness Report (2017–2019) (Halliwell et al., 2020), the mean happiness, on a scale of 0–10, is:

Whole world ($n = 153$)

$M = 5.4728$

$SD = 1.1132$

Denmark: $M = 7.646$

Norway: $M = 7.488$

Sweden: $M = 7.353$

Germany: $M = 7.076$

UK: $M = 7.165$

Afghanistan: $M = 2.567$

(The lowest mean in the world)

1. Question 1. How Long Does It Take for Scandinavia to Achieve Its Current Advantage in Happiness?

1.1. Scenario 1: Mean Happiness in Scandinavia at the Dawn of the Viking Age was the Same as in Germany and the UK. For a Conservative Estimate, We Will Use Germany's Figure ($M = 7.076$)

The difference from Denmark in SD units:

$$(7.646 - 7.076)/1.1132 = .512$$

Scandinavians increased SQ by .1838 SD units per generation. Thus, in order for Danes to create their current advantage over Germans, it would take $.512/.1838 = 2.786$ generations.

According to Geijer (1896), young Norse men typically started their careers as Vikings around age 15 and settled down with family by age 20. Thus the generation time for Vikings was probably about 20 years. It would therefore take $20 \times 2.786 = 55.72$ years for Danes to achieve the current advantage in happiness over Germans.

According to Brink (2008, p. 5), Jesch (1991, pp. 1–8), and Wolf and Mueller-Vollmer (2018, pp. ix–xiii), the Viking Age lasted for 273 years or 13.65 generations (793–1066). So it

would be possible for Danes to have gained their current advantage in happiness over Germans during the Viking Age.

1.2. Scenario 2: Mean Happiness in Scandinavia at the Dawn of the Viking Age was the Same as the World Mean

The difference from Denmark in *SD* units:

$$(7.646 - 5.4728)/1.1132 = 1.952$$

In order for Danes to create their current advantage over the rest of the world, it would take $1.952/.1838 = 10.620$ generations, or $20 \times 10.620 = 212.40$ years.

It would be possible for Danes to have gained their current advantage in happiness over the rest of the world during the Viking Age.

1.3. Scenario 3: Mean Happiness in Scandinavia at the Dawn of the Viking Age was the Lowest in the World (comparable to Afghanistan Today)

The difference from Denmark in *SD* units:

$$(7.646 - 2.567)/1.1132 = 4.563$$

In order for Danes to create their current advantage over Afghanistan today, it would take $4.563/.1838 = 24.826$ generations or $20 \times 24.826 = 496.52$ years.

It would therefore *not* be possible for Danes to have gained their current advantage over Afghanistan today during the Viking Age.

2. Question 2: How Large Does the Outmigration Have to Be During the Viking Age for Scandinavia to Gain Its Current Advantage in Happiness?

2.1. Scenario 1: Mean Happiness in Scandinavia at the Dawn of the Viking Age was the Same as in Germany

The Viking Age (793–1066) = 273 years/13.65 generations.

$$.512/x = 13.65$$

$$x = .512/13.65 = .0375$$

Danes would have to increase their *SQ* by .0375 *SD* units per generation to achieve their current advantage over Germany in 273 years/13.65 generations.

Given the heritability of *SQ* $h^2 = .5$, the outmigration rate would have to be such that the *SQ* would increase $.0375/.5 = .0750$.

According to Johnson and Thomopoulos (2002, Table 1), if $K_L = -1.8$, the mean of the left-truncated standard normal distribution would be $1.8819 - 1.8 = .0819$.

According to David Lane's applet (https://davidmlane.com/hyperstat/z_table.html), $z = -1.8$ corresponds to .0359.

In order for Denmark to achieve its current advantage in *SQ* over Germany in 13.65 generations, the outmigration rate per generation would have to be .0359, which means that about 7% of Scandinavian men would have to be mateless, engage in Viking activities, and never return to

Scandinavia ($7/(100 + 93) = .0362$). This is equivalent to saying that 7% of girls were eliminated by female infanticide.

This figure is consistent with the common view among historians and Viking experts that only a minority of Scandinavian men engaged in Viking activities (Williams, 2008; Wolf & Mueller-Vollmer, 2018, pp. 25–36).

2.2. Scenario 2: Mean Happiness in Scandinavia at the Dawn of the Viking Age was the Same as the World Mean

$$1.952/x = 13.65$$

$$x = 1.952/13.65 = .1430$$

Danes would have to increase their *SQ* by .1430 *SD* units per generation to achieve their current advantage over the whole world in 273 years/13.65 generations.

Given the heritability of *SQ* $h^2 = .5$, the outmigration rate would have to be such that the *SQ* would increase $.1430/.5 = .2860$.

According to Johnson and Thomopoulos (2002, Table 1), if $K_L = -1.0$, the mean of the left-truncated standard normal distribution would be $1.2876 - 1.0 = .2876$.

According to David Lane's applet (https://davidmlane.com/hyperstat/z_table.html), $z = -1.0$ corresponds to .1587.

In order for Denmark to achieve its current advantage in *SQ* over the rest of the world in 13.65 generations, the outmigration rate per generation would have to be .1587, which means that about 27% of Scandinavian men would have to be mateless, engage in Viking activities, and never return to Scandinavia ($27/(100 + 73) = .1561$). This is equivalent to saying that 27% of girls were eliminated by female infanticide.

This figure is consistent with the common view among historians and Viking experts that only a minority of Scandinavian men engaged in Viking activities (Williams, 2008; Wolf & Mueller-Vollmer, 2018, pp. 25–36).

2.3. Scenario 3: Mean Happiness in Scandinavia at the Dawn of the Viking Age was the Lowest in the World (Comparable to Afghanistan Today)

$$4.563/x = 13.65$$

$$x = 4.563/13.65 = .3343$$

Danes would have to increase their *SQ* by .3343 *SD* units per generation to achieve their current advantage over Afghanistan in 273 years/13.65 generations.

Given the heritability of *SQ* $h^2 = .5$, the outmigration rate would have to be such that the *SQ* would increase $.3343/.5 = .6686$.

According to Johnson and Thomopoulos (2002, Table 1), if $K_L = -.2$, the mean of the left-truncated standard normal distribution would be $.8751 - .2 = .6751$.

According to David Lane's applet (https://davidmlane.com/hyperstat/z_table.html), $z = -.2$ corresponds to .4207.

In order for Denmark to achieve its current advantage in SQ over Afghanistan in 13.65 generations, the outmigration rate per generation would have to be .4207, which means that about 60% of Scandinavian men would have to be mateless, engage in Viking activities and never return to

Scandinavia ($60/(100 + 40) = .4286$). This is equivalent to saying that 60% of girls were eliminated by female infanticide. This seems like an implausibly high number, as all Vikings experts agree that only a minority of Scandinavian men engaged in Viking activities.