9-8-2023

Individual Difference Correlates of Being Sexually Unrestricted Yet Declining an HIV Test

Nicholas S. Holtzman

Stephen W. Carden

Stacy W. Smallwood

Janice Steirn

S. Mason Garrison

UNIVERSITY of CALIFORNIA PRESS | Collabra: Psychology

Holtzman, N. S., Carden, S. W., Smallwood, S. W., Steirn, J. N., Garrison, S. M., & Gesselman, A. N. (2023). Individual Difference Correlates of Being Sexually Unrestricted Yet Declining an HIV Test. *Collabra: Psychology*, *9*(1).
https://doi.org/10.1525/collabra.87458

Personality Psychology

Individual Difference Correlates of Being Sexually Unrestricted Yet Declining an HIV Test

Nicholas S. Holtzman[1][a], Stephen W. Carden[2], Stacy W. Smallwood[3], Janice N. Steirn[4][b], S. Mason Garrison[5], Amanda N. Gesselman[6]

[1] Department of Psychology, Southeastern Louisiana University, Hammond, LA, US, [2] Department of Mathematical Sciences, Georgia Southern University, Statesboro, GA, US, [3] Department of Health Policy and Community Health, Georgia Southern University, Statesboro, GA, [4] Psychology, Georgia Southern University, Statesboro, GA, US, [5] Department of Psychology, Wake Forest University, Winston-Salem, NC, US, [6] Kinsey Institute, Indiana University, Bloomington, IN, US

Keywords: Big 5, dark triad, HIV, information avoidance, personality

https://doi.org/10.1525/collabra.87458

Collabra: Psychology

Vol. 9, Issue 1, 2023

Which individual differences accurately predict one's decision to get tested for human immunodeficiency virus (HIV), and do individuals who have regular short-term sex get tested at higher rates? Two studies—one lab study (total valid $N = 69$, with $n = 20$ who were tested) and one involving a student health center (valid $N = 250$, $n = 4$ who were tested)—involved participants (total valid $N = 319$, with $n = 24$ who got tested) taking a number of personality and individual difference measures, including the dark triad (Machiavellianism, narcissism, and psychopathy). Then, in both studies, participants had the opportunity to actually get tested for HIV. After analyzing data from Study 1, for Study 2 we preregistered the prediction that narcissistic participants would tend to (a) show disinclination to get tested for HIV, and (b) show proclivity for unrestricted short-term sexual behavior, manifesting in (c) a significant difference between these two correlations. As predicted, such a difference in correlations was evident for narcissism as well as psychopathy (the latter, however, was not predicted), suggesting that such individuals are not likely to seek HIV diagnostic information, but are taking more sexual risks. A research synthesis was consistent with these ideas (although controlling for demographic factors diminished the effects). Narcissistic and psychopathic individuals may be undetected hubs in the network of sexually active individuals with HIV. These results are silent on whether the typical HIV patient is narcissistic or psychopathic; the results merely implicate narcissistic and psychopathic traits in the spread of the virus.

HIV and AIDS continue to be major public health concerns in the United States, with 1.1 million people living with HIV in the nation, and about 40,000 new diagnoses each year (CDC, 2022). Importantly, about 14 out of 100 people who have HIV in the U.S. are unaware that they have it (CDC, n.d.). In the past era when immediate diagnosis was impossible, prior research revealed that up to 55% of people who got tested for HIV did not return for the diagnostic information (Hightow et al., 2003). Rapid testing is now available, removing the additional step of having to return for potentially bad news. However, many people do not pursue testing regularly. Therefore, it is important to increase testing and diagnosis to more quickly identify new infections and immediately enroll those individuals into the continuum of care. Getting resources to people living with HIV as quickly as possible—resources such as viral load suppressants—could reduce the spread of HIV and help them to maintain a healthy lifestyle (Rodger et al., 2019). Moreover, increasing HIV testing is essential to addressing Goal 1 of the HIV National Strategic Plan for the United States (Health & Services, 2021), which is to prevent new infections through increasing awareness of HIV and knowledge of HIV status.

HIV testing is likely determined by sociological or situational factors as well as individual difference factors. At institutional and interpersonal levels, barriers to HIV testing include access to testing and HIV-related stigma (Bond et al., 2005; Levy et al., 2014; Meyerson et al., 2014); re-

a Parts of this paper were written by NSH at both Georgia Southern University and Southeastern Louisiana University.

Correspondence concerning this article should be addressed to Nicholas S. Holtzman, Department of Psychology; 204 Azalea Circle, Mims Hall, Room 235, SLU 10831, Hammond, LA 70402. E-mail: nick.holtzman@gmail.com

b Professor Emeritus

moving such barriers will slow new infections. Our project concerns individual differences that might predict the decision to pursue HIV testing. Someone who is not meticulous in general is likely not meticulous about HIV testing decisions. Identifying such individual differences could enhance a targeted intervention and assist in tailoring public service announcements (e.g., to people who are not meticulous). The field of personality psychology can help in this regard because not only have individual differences like personality traits been robustly documented as stable over long periods of the lifespan (McCrae & Costa, 1994; cf. Specht et al., 2011), but also they are powerful predictors of important life outcomes (Roberts et al., 2007). This is a point that even staunch detractors—who tend to emphasize instability and the power of the situation—indeed acknowledge (Mischel et al., 1989; Shoda et al., 1990). Moreover, traits have been predictive of health behavior (e.g., Roberts et al., 2007; Schlam et al., 2013). Traits can be useful in understanding how and whether people live healthy lives.

In HIV research, identifying HIV-positive individuals who are not yet diagnosed is critical. We need to understand their personalities, which would help interventionists target these individuals (Sweeny et al., 2010). Specifically, if we knew which personalities were likely to forgo testing, we could invest more resources in persuading them to get tested and to get health services. This could have beneficial effects such as making public service announcements more efficient by presenting targeted advertisements to these individuals (Matz et al., 2017), as has been done in related health domains (Everett & Palmgreen, 1995) and will likely very soon be done in the metaverse (Plechatá et al., 2022). This would facilitate diagnosis and treatment, and it could ultimately reduce the burden of the disease. There is some information available about people living with HIV/AIDS and how they adhere to anti-retroviral therapy (Hernandez-Huerta et al., 2021), with people who are impulsive showing lower adherence. There is also some research on personality and disease progression among HIV-infected individuals (Ironson et al., 2008) as well as some research on personality traits and participation in HIV vaccine trials (Johnson, 2000), the latter of which showed a relationship between greater neuroticism and greater risk perceptions of contracting HIV. Other work points to the associations between personality traits among HIV-infected individuals compared to those not infected (O'Cleirigh et al., 2018). Relatively little is known, however, about how personality directly predicts the decision to get tested for HIV—probably because the logistics involved in getting people tested (including coordination of personnel who run bio-safety labs) are difficult to coordinate and maintain. Conducting personality assessment immediately prior to an optional HIV diagnostics session has not been done before, to the best of our knowledge. This paper presents two studies and a research synthesis of the personality traits of the people who opt into (or out of) getting tested for HIV.

For Study 1, we had two hypotheses. First, we predicted that people more likely to avoid information about their HIV status would be less likely to agree to an HIV test. The second hypothesis focused on narcissism, which is of keen interest because it is positively associated with short-term mating strategies (e.g., Holtzman & Donnellan, 2015), which put people at risk for contracting sexually transmitted infections (Jonason et al., 2015; Pinkerton & Abramson, 1995). Two small empirical studies and a review about sexually transmitted infections are consistent with this idea (Bjekic et al., 2002; Erbelding et al., 2004; see also Widman & McNulty, 2011 for review). Moreover, some narcissistic people tend to believe they are invulnerable (Aalsma et al., 2006), which could make them believe that they are not susceptible to contracting infections. Furthermore, narcissistic individuals are notorious for having low empathy (Hepper et al., 2014), which could contribute to passing along infections to their partners (Martin et al., 2013; Widman & McNulty, 2011). The people who are potentially among the most likely to forgo testing (those with narcissistic tendencies) are the people most likely to engage in short-term unrestricted sex, thereby increasing the spread of HIV (Widman & McNulty, 2011). So, we pre-registered the prediction for Study 1 that narcissism would be negatively related to getting tested for HIV. In hindsight, and after further reading the literature (e.g., Jones & de Roos, 2017), similar predictions might have been made for psychopathy, but we did not advance those predictions a priori. Expanded subsequently, a crucial insight from Study 1 was that testing for HIV was very likely related to the personalities of people who had been engaging in behaviors that put them at risk for contracting HIV. Such risks include, for instance, unrestricted (short-term) sociosexual behaviors. So, we not only identify the personality correlates of who gets tested for HIV, but also consider which personalities are engaging in unrestricted sociosexual behaviors.

Following these observations from Study 1, in Study 2 we compare (a) the correlation between each trait and HIV testing with (b) the correlation between each trait and unrestricted sociosexual behaviors. This allows for determining who is calibrating their HIV testing to a key indicator of their sexual risk-taking (i.e., sociosexual behaviors). If a trait is negatively associated with HIV testing, that doesn't necessarily mean that the trait is a risk factor for spreading HIV. To assess that risk, it would be necessary to consider whether said trait is associated with engaging in short-term sexual behaviors that elevate HIV risk.

Finally, to enhance statistical power as much as possible (with these difficult-to-collect data), we subsequently integrate all the data. This helps reveal the personalities of those who get tested for HIV, the personalities of those who engage in unrestricted sociosexual behavior, and the difference between these two—ultimately revealing the extent to which different personalities calibrate their HIV testing behavior to their associated unrestricted sociosexual behavior.

Study 1

Method for Study 1

This study was IRB-approved. The pre-registration (https://osf.io/j89g4) specified that we would stop collecting data on 15 December 2018; we followed this protocol.

We report all the measures used in this study. The pre-registered data exclusions were implemented as evident in the R Markdown code on the Open Science Foundation (https://osf.io/hsaqg/). We followed the pre-registered plan except in instances explicitly noted in this article.

Participants

Participants (total N = 87; valid n = 69; [i.e., 18 were excluded for reasons described below]; of the valid participants, 29% of them, which is n = 20, received an HIV test) were college students (M age = 19.06, SD of age = 1.45) earning partial credit or extra credit for classes at a large, rural, public university in the southeastern United States—an area with high HIV prevalence (CDC, 2022). They were mostly women (n = 16 men and n = 53 women), and mostly European American or White (n = 26 African American or Black, n = 35 European American or White, and n = 8 from other races or multiple races). Most of these people were heterosexual (n = 63 heterosexual; n = 6 having other sexual orientations).

In accord with the pre-registration, participant data were excluded entirely if any of the following criteria were met: (a) Participants completed the survey battery in under eight minutes, (b) participants missed any of the three validity checks embedded in the survey, or (c) participants explicitly indicated that their responses were invalid as per the item by Aust and colleagues (2013).

Materials

The goal was to have broad coverage of numerous traits and individual differences that might capture variance in the choice to receive diagnostic information about HIV. Accordingly, we used measures derived from a wide literature search in personality and social psychology.

Table 1 contains the means, standard deviations, actual range, possible range, and Cronbach's alpha for each measure used in Study 1.

Big Five. We assessed the Big 5 personality traits using the BFI-2, a reliable and valid measurement of the Big 5 (Soto & John, 2017). The 60 items that are evenly split across the five factors are on a 1 (*Disagree Strongly*) to 5 (*Agree Strongly*) Likert scale. A sample item that assesses "negative emotionality" (A.K.A., neuroticism) is "I am someone who is moody, has up and down mood swings." In Study 1, Cronbach's alphas for the five factors ranged from .79 to .85, as shown in Table 1.

Information Avoidance. We created our own measure of information avoidance regarding HIV diagnosis called the Information Avoidance Scale for HIV (IAS-HIV). This is based on previous work aimed at establishing a general scale for information avoidance (Howell & Shepperd, 2016). The eight items are on a 1 (*Disagree Strongly*) to 5 (*Agree Strongly*) Likert scale. A sample item is "I would rather not know whether I have HIV/AIDS." In our study, Cronbach's alpha was .74. The assessment can be seen in the Qualtrics System File (.qsf file) on the Open Science Foundation site for the project (https://osf.io/hsaqg/).

Dark Triad. We assessed the "Dark Triad" (Machiavellianism, narcissism, and psychopathy) with the Short Dark Triad, a reliable and valid measure of these three traits (Jones & Paulhus, 2014). The 27 items are on a 1 (*Disagree Strongly*) to 5 (*Agree Strongly*) Likert scale. A sample item assessing narcissism is "I have been compared to famous people." The Cronbach's alphas for Machiavellianism, narcissism, and psychopathy were .83, .73, and .70, respectively.

Long-Term Mating. We assessed long-term mating using the Long-Term Mating Orientation measure (Jackson & Kirkpatrick, 2007). The 10 items are on a 1 (*Disagree Strongly*) to 7 (*Agree Strongly*) Likert scale. A sample item is "I am interested in maintaining a long-term romantic relationship with someone special." The Cronbach's alpha was .84.

Short-Term Mating. We assessed short-term mating propensity using the Sociosexuality Orientation Inventory Revised, a reliable and valid measure of this individual difference (Penke & Asendorpf, 2008). The nine items have varying scales that can be converted to a standard 1 to 9 Likert scale so that they can be averaged; in our case, Qualtrics included code for front-end conversion to the 1-to-9 Likert scale. A sample item is "Sex without love is OK." The Cronbach's alpha for the 9-item version was .90.

Self-esteem. We assessed self-esteem using the Single-Item Self Esteem (SISE) measure, which exhibits test-retest reliability and validity (Robins et al., 2001). The sole item is: "I have high self-esteem." It is assessed on a 1 (*not very true of me*) to 5 (*Agree Strongly*) Likert scale.

Procedure

Participants entered the lab (one at a time), filled out the informed consent, and then commenced with the assessments, which were completed via Qualtrics. On the last page of the assessment, they were presented the following text:

> IMPORTANT. There is one last choice you have. There is a certified HIV testing specialist in {room number}. The specialist can quickly tell you whether you have HIV by conducting a 1 minute rapid test. If you opt in, you will get your results immediately. Your results of the HIV test are not part of the study. (The research team is simply interested in whether you opt in to testing.) You will not receive any additional SONA credit for getting tested. The testing is FREE. Most people don't have HIV, but it would be good to get tested, just to be safe. Will you get tested for HIV today?

Participants who selected "no" exited the lab and left the building. Participants who selected "yes" were guided by the research assistant who was blind to the study hypotheses. The research assistant pointed participants to a biosafety room approximately 100 feet away for HIV diagnostics, and ensured that the participants were holding a sticky note with their participant identification. In that room, the participants were greeted by an HIV testing specialist affiliated with the Georgia Department of Public Health. The specialist educated the participants about the blood draw

Table 1. Study 1: Descriptive Statistics and Cronbach's alpha for each measure.

			Actual Range		Possible Range		
	M	*SD*	Lowest	Highest	ScaleMin	ScaleMax	Alpha
HIV Test	0.29	NA	0.00	1.00	0.00	1.00	NA
IAS-HIV	1.26	0.44	1.00	2.88	1.00	5.00	0.74
Openmindedness	3.94	0.61	2.50	4.92	1.00	5.00	0.81
Conscientiousness	3.84	0.63	2.08	4.92	1.00	5.00	0.85
Extraversion	3.41	0.70	2.00	4.92	1.00	5.00	0.84
Agreeableness	3.83	0.59	2.50	4.83	1.00	5.00	0.79
Negative emotionality	2.83	0.75	1.33	4.33	1.00	5.00	0.85
Machiavellianism	2.88	0.77	1.44	4.22	1.00	5.00	0.83
Narcissism	2.97	0.66	1.33	4.44	1.00	5.00	0.73
Psychopathy	2.01	0.61	1.00	3.44	1.00	5.00	0.70
LTMO	6.32	0.76	3.00	7.00	1.00	7.00	0.84
SOIR	3.05	1.71	1.00	7.56	1.00	9.00	0.90
SOIR-Beh	2.30	1.68	1.00	7.33	1.00	9.00	0.89
SISE	3.43	1.06	1.00	5.00	1.00	5.00	NA

Note. IAS-HIV = Information Avoidance Scale for HIV; LTMO = Long-Term Mating Orientation; SOIR-Beh = Sociosexuality Orientation Inventory Revised - Behavior facet; SISE = Single Item Self-Esteem scale.

that was about to take place, and then the participants completed the blood draw (using INSTI). Participants received the results of their HIV test, which for ethical reasons were not made available to the principal investigator, nor anyone on the study team; at that time, participation in this study was complete. The specialist recorded on the sticky note whether the participant actually got tested for HIV. This served as the key binary outcome variable in our study (0 = not tested; 1 = tested).

Data Analysis

We used R (version R-4.2.3) for all our analyses for this manuscript (R Core Team, 2018). We used the papaja package (built with R Markdown) to knit the manuscript into a PDF (Aust & Barth, 2018).

Results for Study 1

Confirmatory Results for Study 1

Table 2 contains the zero-order correlations among all of the measures as well as the correlations with the critical outcome variable, HIV testing. In accordance with the preregistration, Table 3 contains the results of a logistic regression relating getting tested for HIV predicted by IAS-HIV and gender; none of these were statistically significant, so controlling for gender did not alter the relationship between IAS-HIV and getting tested for HIV.

Exploratory Results for Study 1

After completing data collection, we realized that the correlations between each trait and the decision to get tested for HIV may be driven by the extent to which each trait is associated with short-term mating tendencies. Psychopathic individuals may be inclined to engage in short-term sex, for example, and this may motivate them to want to get tested for HIV. Thus, we wanted to determine the extent to which the correlations between (a) the trait and sociosexuality on the one hand and (b) the trait and HIV testing decisions on the other hand, were meaningfully different. This captures how well each trait is calibrated to getting tested. A standard test for the difference in (possibly dependent) correlations is the Steiger test (Steiger, 1980), which we used for our initial analysis. Unfortunately, the test statistic relies on asymptotic normality, and the sample sizes in this study (and Study 2 as well as the research synthesis) are small enough that normality may not be realized. We will save the details for a sensitivity check presented after the research synthesis, but in short, we surmised that it is more statistically viable to replace the *p*-value from the Steiger analysis with one from a bootstrap test for testing the statistical significance of the difference of the correlations. Table 4 contains these exploratory analyses, namely the zero-order correlations between each trait and the decision to get tested for HIV, and the zero-order correlations between each trait and the Sociosexuality Orientation Inventory Revised Behavior Facet, along with the Steiger test statistic and bootstrapped *p*-value for the difference in dependent correlations. Negative *t*-values indicate a tendency to fail to get tested for HIV as much as is warranted, whereas positive *t*-values indicate a tendency to get tested for HIV perhaps more readily than is warranted. One of these tests turned out to be significant; namely, extraversion was negatively associated with the decision to get tested, despite being positively associated with sociosexual behavior (Steiger Case A results: $t = -3.09$, $p < .01$). This indicates that people with extraverted tendencies may not get tested for HIV as much as their short-term sexual behaviors suggest perhaps they should.

Table 2. Study 1: Correlation matrix (*N*=69) for key study variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. HIV Test	1.00													
2. IAS-HIV	.05	1.00												
3. Openmindedness	.26	.01	1.00											
4. Conscientiousness	-.26	-.37	-.03	1.00										
5. Extraversion	-.23	-.09	.34	.13	1.00									
6. Agreeableness	-.13	-.23	.15	.42	.07	1.00								
7. Negative emotionality	.37	.19	.13	-.35	-.32	-.05	1.00							
8. Machiavellianism	.21	.17	.10	-.45	.14	-.59	.07	1.00						
9. Narcissism	-.01	.05	.17	-.14	.60	-.21	-.18	.49	1.00					
10. Psychopathy	.25	.21	.13	-.46	.18	-.68	.11	.66	.33	1.00				
11. LTMO	.10	.00	.03	-.07	.16	.31	.24	-.06	.04	-.17	1.00			
12. SOIR	.06	.13	.31	-.30	.17	-.28	.21	.39	.15	.56	-.14	1.00		
13. SOIR-Beh	-.01	.15	.19	-.19	.27	-.22	.17	.24	.13	.46	-.08	.83	1.00	
14. SISE	-.14	-.11	.02	.31	.38	-.07	-.55	.09	.32	.03	-.14	-.09	.07	1.00

Note. Correlations greater than or equal to .24 are statistically significant (two-tailed), $p < .05$. IAS-HIV = Information Avoidance Scale for HIV; LTMO = Long-Term Mating Orientation; SOIR = Sociosexuality Orientation Inventory Revised; SISE = Single Item Self-Esteem scale.

Table 3. Study 1: Logistic model for getting HIV tested against IAS and Gender

Predictor	*b*	95% CI	*z*	*p*
Intercept	-1.17	[-2.77, 0.45]	-1.45	.147
IAS	0.27	[-0.97, 1.41]	0.45	.653
Gender2	-0.27	[-1.66, 0.95]	-0.42	.676

Note. Gender2: 2 = Men. IAS-HIV: Information Avoidance Scale for HIV

Table 4. Study 1: Correlations (*N*=69) with the Decision to get tested for HIV and the Sociosexuality Behavior Facet as well as Steiger (1980) and bootstrap analyses for the difference in correlations.

	HIV Test		SOIR Behavior		Steiger	Bootstrapped
	r	[95% CI]	*r*	[95% CI]	*t*-value	*p*-value
IAS-HIV	.052	[-.187, .285]	.149	[-.091, .373]	-.562	.509
Openmindedness	.257	[.022, .465]	.194	[-.045, .411]	.378	.716
Conscientiousness	-.265	[-.472, -.030]	-.187	[-.406, .052]	-.463	.711
Extraversion	-.232	[-.444, .005]	.273	[.039, .479]	-3.092	.003
Agreeableness	-.132	[-.357, .109]	-.216	[-.430, .022]	.494	.701
Negative emotionality	.369	[.145, .557]	.168	[-.072, .389]	1.234	.177
Machiavellianism	.213	[-.024, .429]	.242	[.005, .453]	-.169	.866
Narcissism	-.011	[-.247, .226]	.127	[-.114, .353]	-.795	.374
Psychopathy	.251	[.016, .461]	.456	[.246, .625]	-1.320	.265
LTMO	.100	[-.140, .329]	-.082	[-.313, .158]	1.053	.206
SOIR-Beh	-.006	[-.243, .231]	1.000	[NA, NA]	NA	NA
SISE	-.142	[-.366, .098]	.069	[-.171, .300]	-1.221	.250

Note. IAS-HIV = Information Avoidance Scale for HIV; LTMO = Long-Term Mating Orientation; SOIR-Beh = Sociosexuality Orientation Inventory Revised - Behavior Facet; SISE = Single Item Self-Esteem scale. The Steiger Case A results test for the difference in dependent correlations (Steiger, 1980).

Discussion for Study 1

For Study 1, we pre-registered the hypothesis that the Information Avoidance Scale for HIV would be negatively associated with getting tested for HIV. The data were inconsistent with this hypothesis (and so this is not discussed further).

Additionally, we pre-registered the hypothesis that narcissism would be negatively related to the decision to get tested for HIV, but the data were inconsistent with this hypothesis. Instead, we found that narcissism was negligibly (albeit negatively) related to the decision to actually get tested for HIV. This finding is still concerning because, in other empirical work (Holtzman & Strube, 2013), narcissism is positively related to short-term mating, and so narcissists are not fully in tune with their sexual risk-taking. We speculate that narcissists do not sufficiently calibrate their HIV testing to their sexual risk-taking, and this speculation is consistent with research showing that grandiose narcissism is tied to unrealistic optimism (Foster & Trimm, 2008); here, the idea is that they are being unrealistically optimistic that HIV could never infect them. This situation led us to study a related construct, Positive Irrational Beliefs, in Study 2.

Exploratory analyses revealed negative emotionality (A.K.A. neuroticism) as the best (positive) predictor of who actually gets tested for HIV; this is relevant to the ongoing debate over healthy neuroticism (Friedman, 2000; Weston et al., 2019). This finding from Study 1 was somewhat unexpected because neuroticism is a positive correlate of information avoidance in several domains (Howell & Shepperd, 2016); accordingly, we attempted to replicate this in Study 2.

Our exploratory analyses in Study 1 revealed that people who are more extraverted are disinclined to adequately calibrate their decision-making about HIV testing to their short-term sexual behavior. Extraverts are disinclined to get tested for HIV, despite engaging in more short-term mating behavior. Because this result was fully exploratory, we went on to test this hypothesis in a confirmatory way in Study 2.

Study 2

To recap, in Study 1, we identified the personality traits related to the choice to get tested for HIV. Study 2 aims to reveal whether these findings replicate—and with more external validity (as we tested for HIV at a university health center in Study 2). We also copied the analytic approach of Study 1, to show which traits calibrate their HIV testing, given their sexual risk-taking behaviors.

We are trying to answer three questions in Study 2, and we had five preregistered predictions:

First: Which personality variables are associated with actually getting tested for HIV? Hypothesis 1: We predict that

neuroticism will be positively associated with actually getting tested for HIV, thus anticipating a replication of the result we found in Study 1. This association would be both interesting and important, if confirmed, because it has implications for the notion of "healthy neuroticism" (Weston et al., 2019) and diagnostic assessment-seeking generally.

Second: Which personality variables are associated with short-term sexual behaviors? Hypothesis 2: Based on the findings from Study 1, we pre-registered the prediction that psychopathy would have a correlation greater than or equal to .30 with unrestricted (short-term) sociosexual behaviors.

Third: What is the difference in magnitude between (a) the association between each personality trait and getting tested for HIV and (b) the association between each personality trait and short-term sexual behaviors? Hypothesis 3A: We predict that the variable that will have one of the biggest differences will be the Positive Irrational Beliefs Scale (PIBS), which is a construct about being overly and unreasonably positive; we expect PIBS to be negatively associated with actually getting tested for HIV, but positively associated with short-term sexual behaviors. We expect this to manifest in a significant difference between the two correlations. Hypothesis 3B: We predict that another variable that will show a significant difference will be narcissism as measured by the Short Dark Triad measure; that is, we expect narcissism to be negatively (or negligibly) associated with actually getting tested for HIV, but positively associated with short-term sexual behaviors. We expect this to manifest in a significant difference between the two correlations. Hypothesis 3C: Finally, we predicted that another variable that would show a significant difference would be extraversion; we expected extraversion to be negatively associated with actually getting tested for HIV, but positively associated with short-term sexual behaviors. We expected this to manifest in a significant difference between the two correlations.

Method for Study 2

This study was IRB-approved.

Preregistration

This study was pre-registered using the as-predicted template (https://osf.io/ywb8z). We followed the pre-registered plan except where explicitly noted.

Participants

In accord with the pre-registration, we filtered the entire sample for Study 2 (N = 391) by excluding participants entirely if any of the following criteria were met: (a) Participants completed the survey battery in under eight minutes, (b) participants missed any of the three validity checks embedded in the survey, or (c) participants explicitly indicated that their responses were invalid as per the item by Aust and colleagues (2013). Additionally, we retained only participants who had no missing data (note that all of the subjects who completed HIV testing happened to have complete data). The remaining sample of participants (valid n = 250; the people tested for HIV amounted to 2% of the valid sample, or n=4 participants) came from a rural, southeastern, comprehensive university; the sample was typical in age for college samples (M = 19.412, SD = 1.741). The racial composition of the sample was mostly White or European American (n = 145) and Black or African American (n = 83), with a small set of people from other races (n = 22). This sample was mostly women (women n = 199; men n = 51). Participant sexual orientations were as follows: heterosexual (n = 221), gay or lesbian (n = 16), other orientations or unspecified (n = 13).

Materials and Procedures

Phase 1 involved the survey only, which participants could take anywhere (i.e., unlike Study 1, this survey occurred outside of the lab). With the exception of including the Positive Irrational Beliefs Scale (Collard et al., 2016), the survey methods for Study 2 were identical to those in Study 1.

Positive Irrational Beliefs Scale. We assessed positive irrational beliefs using the Positive Irrational Beliefs Scale, which was previously found to be a reliable and valid measure of this individual difference (Collard et al., 2016). The items are on a 0 (*Disagree Completely*) to 10 (*Agree Completely*) Likert scale. A sample item is "I am always successful at the things I do." There are no reverse-scored items. The Cronbach's alpha was .66. The psychometric characteristics of all measures for Study 2 can be seen in Table 5.

At the end of Phase 1 in this study, participants viewed this text, providing instructions as to how they could choose whether to get tested for HIV:

> IMPORTANT. There is one last choice you have. There is an HIV testing specialist at the Georgia Southern University Health Services Center in Statesboro, GA, who can test whether you have HIV. You will obtain a $15 voucher in your inbox for this specific purpose by entering your email address below. Your results of the HIV test are not part of the study. (The research team is simply interested in whether you opt in to testing.) You will not receive any additional SONA credit for getting tested for HIV. The testing is FREE when the voucher is applied. Most people don't have HIV, but it would be good to get tested, just to be safe. If you elect to get tested for HIV, enter your email address. Your email address will be deleted prior to any data analyses, making it impossible for the professor to link any of your responses to you. Furthermore, the professor is the only one with access to this de-identified data.

Phase 2 involved participants choosing whether to visit an on-campus health clinic (about a 15 min walk from the psychology building) where they would receive free HIV testing. The participants who wanted to be tested had to print a form (e.g., at home) that contained their participant ID number, so that the research team could link the ID of those who were actually tested with their corresponding survey responses. HIV testing specialists at the university health services center administered the HIV test, and the specialists returned the sheets of paper with the IDs on

Table 5. Study 2: Descriptive Statistics and Cronbach's alpha for each measure.

			Actual Range		Possible Range		
	M	*SD*	Lowest	Highest	ScaleMin	ScaleMax	Alpha
HIV Test	0.02	0.13	0.00	1.00	0.00	1.00	NA
IAS-HIV	1.30	0.52	1.00	3.62	1.00	5.00	0.80
Openmindedness	3.81	0.61	2.00	5.00	1.00	5.00	0.80
Conscientiousness	3.77	0.61	2.08	5.00	1.00	5.00	0.82
Extraversion	3.41	0.66	1.50	4.92	1.00	5.00	0.82
Agreeableness	3.81	0.59	1.92	5.00	1.00	5.00	0.78
Negative emotionality	2.97	0.82	1.25	5.00	1.00	5.00	0.89
Machiavellianism	2.93	0.65	1.33	5.00	1.00	5.00	0.72
Narcissism	3.01	0.65	1.22	4.67	1.00	5.00	0.70
Psychopathy	2.03	0.63	1.00	4.33	1.00	5.00	0.74
LTMO	6.26	0.83	2.11	7.00	1.00	7.00	0.83
SOIR	3.29	1.68	1.00	8.89	1.00	9.00	0.88
SOIR-Beh	2.51	1.69	1.00	8.67	1.00	9.00	0.88
PIBS	3.63	1.54	0.00	8.56	0.00	10.00	0.86
SISE	3.37	1.13	1.00	5.00	1.00	5.00	NA

Note. IAS-HIV = Information Avoidance Scale for HIV; LTMO = Long-Term Mating Orientation; PIBS = Positive Irrational Beliefs Scale; SOIR = Sociosexuality Orientation Inventory Revised; SISE = Single Item Self-Esteem scale.

them to the research team for manual input. The team used the double-entry method to ensure accuracy of ID entry.

Results for Study 2

To explore the zero-order correlations among the variables, we ran Pearson correlations, shown in Table 6.

The correlations between each individual difference and whether people got tested for HIV are presented in the leftmost column of Table 7. Correlations between each individual difference and SOIR-Behavior appear in the next column of Table 7. Steiger Case A results appear in the third column, and the CI for the bootstrapped difference appears in the final column. We preregistered the prediction that neuroticism would be associated with HIV Testing, but this prediction was unsupported. Table 7 also contains the correlations between each variable and the Sociosexuality Behavior facet, as well the Steiger Case A results, which compare the two key correlations from each row of the table. We preregistered the prediction that psychopathy would be positively associated with the sociosexual behavior facet; indeed, it turned out to be associated with that facet (r = .434). Table 7 also displays results for our preregistered predictions that three variables would show evidence of a difference between the correlation between HIV testing and the variable of interest, and the correlation between SOIR-Behavior and the variable of interest. Three specific predictions were for extraversion (3A), narcissism (3B), and positive irrational beliefs (3C). For extraversion, we did not find evidence consistent with this hypothesis in Study 2 (in contrast to Study 1). For narcissism, the difference in the two correlations was evident (and in the expected direction, with a negative relationship with HIV testing, but a positive relationship with sociosexual behavior). The Positive Irrational Beliefs difference was not significant, and is not discussed further; note that PIBS is not included in the Research Synthesis that we present subsequently because it was only measured in Study 2.

As in Study 1, we computed bootstrapped confidence intervals and bootstrapped p-values for the difference in correlations, and although the results changed numerically, the results did not change in qualitative or substantive ways. The interested reader can inspect these values at the right side of Table 7.

Discussion for Study 2

Two of the five pre-registered hypotheses were supported; the two hypotheses that were supported were the hypothesis that people high in psychopathic personality would report more unrestricted sociosexual behavior (which is consistent with a fairly homogeneous literature on psychopathy and short-term mating (Ali & Chamorro-Premuzic, 2010; Holtzman & Strube, 2013; Jones & de Roos, 2017)) as well as the hypothesis that narcissists would show a difference between (infrequent) HIV testing and (frequent) sociosexual behavior. The latter finding indicates that narcissistic people may fail to calibrate their (infrequent) HIV testing to their (frequent) unrestricted sociosexual tendencies.

Because this is a behavioral study, these data are quite expensive (in terms of time, money, and space requirements), and so—unsurprisingly here—one limitation is that the sample size is small, particularly for the set of participants who got tested. Therefore, in a research synthesis presented next, we combined of all the data from Studies 1 and 2.

Table 6. Study 2: Correlation matrix (*N*=250) for key variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. HIV Test	1.00														
2. IAS-HIV	-.01	1.00													
3. Openmindedness	.02	-.08	1.00												
4. Conscientiousness	-.13	.00	.18	1.00											
5. Extraversion	.03	-.05	.18	.28	1.00										
6. Agreeableness	-.08	-.01	.14	.35	.25	1.00									
7. Negative emotionality	.02	.01	.04	-.24	-.28	-.31	1.00								
8. Machiavellianism	.13	.03	-.14	-.24	-.14	-.51	.15	1.00							
9. Narcissism	-.07	-.02	.11	.15	.55	.02	-.19	.20	1.00						
10. Psychopathy	.10	.02	-.06	-.37	.03	-.62	.22	.60	.29	1.00					
11. LTMO	-.05	.04	.00	.29	.04	.25	-.07	-.26	.03	-.31	1.00				
12. SOIR	.13	-.09	.09	-.31	.00	-.29	.16	.35	.09	.48	-.31	1.00			
13. SOIR-Beh	.07	-.04	.00	-.21	.02	-.21	.14	.36	.14	.43	-.16	.81	1.00		
14. PIBS	.06	.09	.08	.15	.24	-.01	-.16	.30	.51	.26	.00	.11	.13	1.00	
15. SISE	-.01	-.02	.07	.18	.36	.14	-.51	.05	.46	.04	.09	.00	-.01	.37	1.00

Note. Correlations of $|r| \geq .125$ are statistically significant, $p < .05$, two-tailed test. IAS-HIV = Information Avoidance Scale for HIV; LTMO = Long-Term Mating Orientation; PIBS = Positive Irrational Beliefs Scale; SOIR = Sociosexuality Orientation Inventory Revised; SISE = Single Item Self-Esteem scale.

Table 7. Study 2: Correlations (*N*=250) with the Decision to get tested for HIV and the Sociosexuality (SOIR) Behavior Facet as well as Steiger (1980) analyses for the difference in correlations.

	HIV Test		SOIR-Behavior		Steiger	Bootstrapped
	r	[95% CI]	*r*	[95% CI]	*t*-value	*p*-value
IAS-HIV	-.006	[-.130, .118]	-.044	[-.167, .081]	.441	.509
Openmindedness	.023	[-.101, .147]	-.004	[-.128, .120]	.313	.717
Conscientiousness	-.130	[-.250, -.006]	-.214	[-.329, -.092]	.993	.277
Extraversion	.026	[-.099, .149]	.019	[-.105, .143]	.072	.982
Agreeableness	-.076	[-.198, .048]	-.213	[-.328, -.091]	1.616	.105
Negative emotionality	.021	[-.104, .144]	.143	[.019, .262]	-1.427	.102
Machiavellianism	.134	[.010, .254]	.358	[.245, .462]	-2.750	.001
Narcissism	-.068	[-.190, .057]	.142	[.018, .262]	-2.458	.010
Psychopathy	.102	[-.022, .223]	.434	[.327, .529]	-4.193	.001
LTMO	-.048	[-.171, .076]	-.165	[-.283, -.041]	1.362	.221
PIBS	.064	[-.060, .187]	.129	[.005, .249]	-.754	.398
SISE	-.013	[-.137, .111]	-.006	[-.130, .118]	-.081	.917

Note. HIV Test = Whether people got tested for HIV, where positive scores indicate getting tested; IAS-HIV = Information Avoidance Scale for HIV; LTMO = Long-Term Mating Orientation; SOIR-Behavior = Sociosexuality Orientation Inventory Revised - Behavior Facet; SISE = Single Item Self-Esteem scale; PIBS = Positive Irrational Beliefs Scale. The Steiger Case A results test for the difference in dependent correlations (Steiger, 1980).

Research Synthesis

A reasonable line of thought about these studies is to question whether too few people were tested for HIV, and whether this places a limit on statistical power as well as a limit on the stability of the results.

Method for Research Synthesis

To maximize statistical power as much as we could, we combined the two data sets (Study 1 n = 69 [of whom 20 were HIV Tested]; Study 2 n = 250 [of whom 4 were HIV Tested]; total N = 319 [of whom n = 24 were HIV Tested]). To do so, we took all of the variables for which we had data in both studies (IAS-HIV, the Big 5 [openness, conscientiousness, extraversion, agreeableness, neuroticism], the Dark Triad [Machiavellianism, narcissism, psychopathy], Sociosexuality, Long-Term Mating Orientation, and self-esteem). We treated each participant as if they had come from a single exploratory study and then analyzed the synthesized data, controlling for Study (1 vs. 2; this was coded as a factor in R).

Results for Rearch Synthesis

Table 8 contains the key results of this (exploratory) synthesis: The correlation [and 95% CIs] between each individual difference and HIV testing (note that correlations that have 95% CIs that do not cross zero are significant at p < .05); the correlation [and 95% CIs] between each individual difference and (unrestricted) Sociosexual Behavior (SOIR-Behavior).

Variables significantly correlated with getting tested for HIV included openmindedness (r = .143), conscientiousness (r = -.128), Machiavellianism (r = .125), and psychopathy (r = .126). Variables significantly related with unrestricted sociosexual behavior included conscientiousness (r = -.210), agreeableness (r = -.214), negative emotionality (r = .151), Machiavellianism (r = .330), narcissism (r = .140), psychopathy (r = .438), and long-term mating orientation (r = -.149).

The bootstrapped inference analyses capture the difference between two dependent correlations. These analyses revealed several significant differences (p < .05) between the two key relationships, that is, (a) the correlation with HIV Testing and (b) the correlation with unrestricted Sociosexual Behavior. Those significant differences were: Machiavellianism, narcissism, psychopathy, and long-term mating orientation. See Table 8 for a complete set of results.

One possibility is that the results in Table 8 are driven in part by demographic factors, rather than by personality. To test this possibility, for Table 9 we computed the same correlations controlling for four binary factors: Men (coded 1; versus women and other genders coded 0); White (coded 1; versus other races coded 0); Heterosexual (coded 1; versus other sexual orientations coded 0); and Study 2 (coded 2; versus the first study coded 1); we also controlled for age. The results of these partial correlations as well as the bootstrapped difference in correlations are shown in Table 9. The bootstrapped inference results showed that only the difference for long-term mating orientation remained statistically significant, p = .047, but this may be a Type I error given the relatively large p-value that is close to .05, and the fact that we ran 11 tests; so, we do not interpret this further. Table 10 shows the correlations among the binary factors.

Sensitivity to Violations of Assumptions for the Statistics

The Steiger test, which compares the correlation effect sizes, relies on multivariate normality of the sample correlations; this in turn requires either the individual variables to be normal or sample sizes large enough that the Central

Table 8. Combination of Studies 1 and 2: Correlations (*N*=319) with the Decision to get tested for HIV and the Sociosexuality (SOIR) Behavior Facet.

	HIV Test		SOIR-Behavior		Bootstrapped Inference		
	r	[95% CI]	*r*	[95% CI]	difference	[95% CI]	*p*-value
IAS-HIV	.001	[-.109, .110]	-.006	[-.116, .104]	.007	[-.128, .143]	.923
Openmindedness	.143	[.034, .249]	.033	[-.077, .143]	.110	[-.025, .253]	.112
Conscientiousness	-.128	[-.234, -.018]	-.210	[-.312, -.102]	.082	[-.066, .240]	.292
Extraversion	-.080	[-.189, .030]	.076	[-.034, .184]	-.157	[-.319, .011]	.071
Agreeableness	-.071	[-.180, .039]	-.214	[-.316, -.107]	.143	[-.003, .298]	.057
Negative Emo.	.105	[-.005, .213]	.151	[.042, .257]	-.046	[-.184, .094]	.499
Machiavellianism	.125	[.015, .231]	.330	[.228, .424]	-.205	[-.370, -.051]	.006
Narcissism	-.042	[-.151, .069]	.140	[.031, .246]	-.182	[-.348, -.011]	.032
Psychopathy	.126	[.016, .233]	.438	[.345, .523]	-.313	[-.476, -.149]	.001
LTMO	.029	[-.081, .138]	-.149	[-.255, -.040]	.178	[.004, .337]	.041
SISE	-.045	[-.154, .065]	.008	[-.102, .117]	-.052	[-.220, .119]	.521

Note. HIV Test = Whether people got tested for HIV, where positive scores indicate getting tested; IAS-HIV = Information Avoidance Scale for HIV; LTMO = Long-Term Mating Orientation; SOIR-Behavior = Sociosexuality Orientation Inventory Revised - Behavior Facet; SISE = Single Item Self-Esteem scale.

Limit Theorem yields approximate multivariate normality. A sample size of 25 is a common rule of thumb, and the literature discusses how this depends on the severity of departure of the individual variables from normality (Bonett & Wright, 2000). Several factors about this study are potentially concerning (although we present results that ultimately allay most of these concerns insofar as they impact how the current results can be interpreted), including the fact that whether a participant opted for HIV testing is a binary variable, the sample sizes are not particularly large, and that the proportion that opted for testing is small. This combination of factors raises questions about minimizing Type I error rates (i.e., minimizing false positives), the statistical power in detecting a true difference, and whether the Steiger test is ultimately appropriate. In this section, we present the results of an analysis testing the sensitivity of the Steiger test to violations of assumptions, as well as compare it to a non-parametric bootstrap approach.

Accordingly, we developed custom code to test how the Steiger test responds to violations of the assumptions, and whether we need to switch to the non-parametric bootstrapping approach. When the null hypothesis of no difference in the compared correlations is true, *p*-values for the Steiger test statistic come from a *t*-distribution with $n - 3$ degrees of freedom. For Study 1 the sample size is 69. Study 1 had more individuals who got HIV tested. As shown in Figure 1, the Steiger test statistic is supposed to be a *t*-distribution (black line). If a person samples from a normally distributed population at the sample size of Study 1, then you get the dashed red distribution, and if you sample from a population with the distribution of the observed data at the sample size of Study 1, then you get the dotted blue distribution. They are all indistinguishable, meaning that the Steiger test is valid for Study 1; neither the sample size nor the binary nature of HIV testing is a problem.

As shown in Figure 2, the horizontal axis is the true difference in correlations, so the null hypothesis is true in the middle at x = 0. The vertical line is the probability of rejecting the null. At x = 0, this would be the probability of rejecting the null when it is true—a Type I error; in other words, the statistical claim would be an error as a false positive claim. This is ideally at .05, the traditional alpha level. The solid black line represents the Steiger test when the normality assumption is met, and the dashed red line represents the Steiger test when sampling from a population with the distribution of the observed data. These are almost identical, as with the conclusion from in the first figure: The Steiger test is fine. The blue dotted line represents the bootstrap test. When x = 0, it is a bit above .05, revealing that the bootstrap test has a slightly inflated Type I error rate. This is unsurprising: When the Steiger test is fine, the extra variability introduced by re-sampling is somewhat harmful.

Study 2 involved only a few participants getting HIV tested, presumably due to the geographical distance between the psychology building and the student health center where HIV testing was offered. In Figure 3, the black and red lines are close, indicating that the sample size is fine, but the blue line reveals kurtosis (low peak, thicker tails). The low proportion of testing is problematic here. In Figure 4, the Steiger test with a normal population is represented with the black line, serving as a baseline for comparison. The red line represents the Steiger test from the observed data, and it has an inflated Type I error rate. The blue line represents the bootstrap test, and has nearly the same Type I error rate, but is biased in that it is more powerful at detecting differences on the negative side than the positive side. This means that neither test is superb in this situation. In Figure 5, which is for the Synthesis, we have a situation comparable to Figure 3 that represents Study 2. The sample size is fine, but the low proportion of testing is a problem. Figure 6 gives us confidence in the bootstrap approach: The Steiger test shows an inflated Type I error rate (alpha), but the bootstrap approach keeps alpha closer to 5%. The bootstrap approach has a little less power for positive differences, but that's acceptable because our main

Table 9. Combination of Studies 1 and 2: Correlations (*N*=319) with the Decision to get tested for HIV and the Sociosexuality (SOIR) Behavior Facet; the partial correlations and bootstrapped inferences control for demographics.

	HIV Test		SOIR-Behavior		Bootstrapped Inference		
	Partial	[95% CI]	Partial	[95% CI]	difference	[95% CI]	*p*-value
IAS-HIV	.078	[-.111, .310]	.000	[-.123, .075]	.078	[-.110, .338]	.412
Openmindedness	.231	[.000, .456]	.000	[-.079, .088]	.231	[.000, .476]	.101
Conscientiousness	-.233	[-.438, .000]	-.210	[-.307, -.103]	-.023	[-.257, .239]	.912
Extraversion	-.025	[-.323, .175]	.021	[-.018, .170]	-.046	[-.397, .156]	.430
Agreeableness	-.148	[-.369, .040]	-.205	[-.312, -.090]	.057	[-.176, .309]	.576
Negative emotionality	.306	[.070, .503]	.169	[.042, .293]	.137	[-.110, .364]	.267
Machiavellianism	.228	[.000, .473]	.337	[.238, .430]	-.109	[-.386, .147]	.423
Narcissism	.000	[-.259, .169]	.127	[.000, .254]	-.127	[-.431, .081]	.181
Psychopathy	.241	[.000, .440]	.432	[.330, .531]	-.191	[-.463, .042]	.134
LTMO	.143	[-.091, .385]	-.121	[-.273, .000]	.264	[.000, .561]	.047
SISE	-.077	[-.345, .056]	.000	[-.114, .098]	-.077	[-.353, .118]	.401

Note. HIV Test = Whether people got tested for HIV, where positive scores indicate getting tested; IAS-HIV = Information Avoidance Scale for HIV; LTMO = Long-Term Mating Orientation; SOIR-Behavior = Sociosexuality Orientation Inventory Revised - Behavior Facet; SISE = Single Item Self-Esteem scale.

Table 10. Phi correlations between the demographic factors and getting tested for HIV (HIV Tested) and the sociosexual orientation inventory revised behavior facet (SOIRBEH) for Studies 1, 2, and combined.

	Study 1		Study 2		Combined	
	HIV Tested	SOIRBEH	HIV Tested	SOIRBEH	HIV Tested	SOIRBEH
Male	-0.05	0.19	0.09	0.08	0.03	0.10
White	-0.39	0.13	-0.09	0.00	-0.20	0.03
Heterosexual	-0.03	-0.15	-0.25	-0.03	-0.09	-0.05
Study_2	NA	NA	NA	NA	-0.43	0.05

Note. Male, White, and Heterosexual are coded in a binary fashion due to sample size constraints. Study_2 is also coded in a binary fashion.

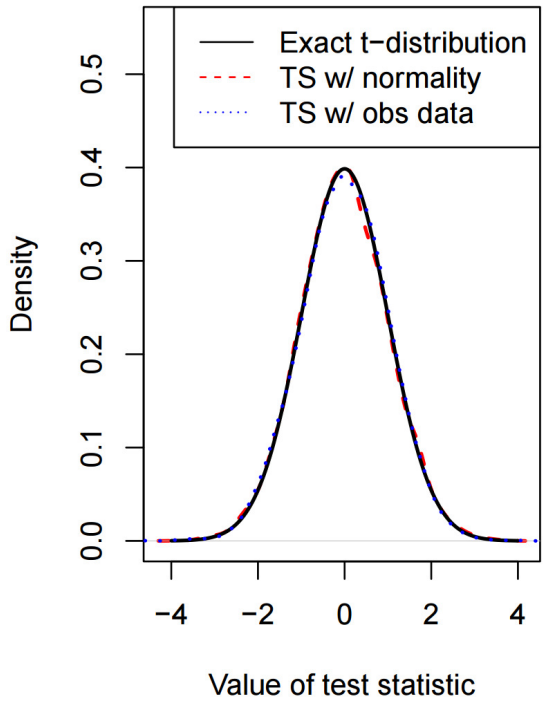

Figure 1. The density of the Steiger test statistic for sample sizes and HIV Test proportions from Study 1.

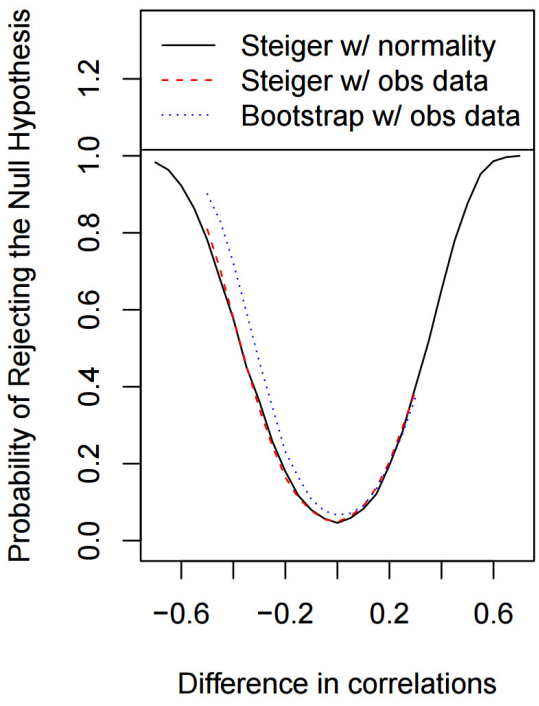

Figure 2. The power function for sample sizes and HIV Test proportions from Study 1.

concern is preserving the Type I error rate. Additionally, it remains less important to detect positive differences; such differences indicate that some traits (like conscientiousness) would be more positively associated with HIV testing than it is associated with short-term sexual behavior. That is less relevant than determining and detecting negative differences, as the negative differences indicate that some trait (like psychopathy) is more negatively associated with testing than it is associated with short-term sexual behavior. In other words, the claim that psychopathic folks are getting tested for HIV less than they should is more crucial than the claim that conscientious people are getting tested more than is necessary. We are trying to detect the risky situations.

All in all, this reveals that the bootstrap approach is better than the Steiger test. It is not always better, but it does appear to be better when considering all analyses. Using the bootstrap approach is warranted.

Discussion: Research Synthesis

The results of the research synthesis suggested that people who get tested for HIV tend to be more broadminded, lower in conscientiousness, as well as somewhat deviant—including evidence of higher Machiavellian and higher psychopathic traits.

Consistent with the literature, unrestricted sociosexual behaviors are positively associated with Machiavellianism, narcissism, psychopathy, and negative emotionality; unrestricted sociosexual behaviors are negatively associated with conscientiousness, agreeableness, and long-term mating propensities. Unrestricted sociosexual behavior is a relatively deviant phenomenon involving deviant and neurotic tendencies, as well as being relatively low on stereotypical pro-social traits like conscientiousness and agreeableness.

Some personalities calibrate their HIV testing to their unrestricted sociosexual behaviors, while others do not. The personality trait most positively associated with getting tested for HIV, while simultaneously least associated

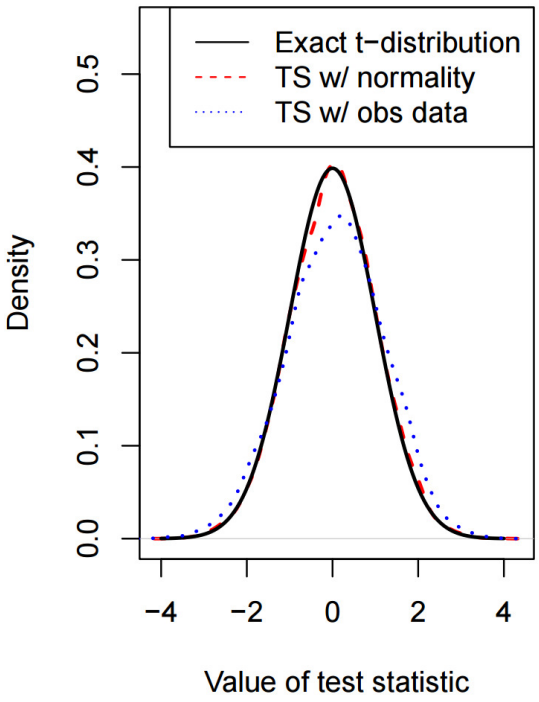

Figure 3. The density of the Steiger test statistic for sample sizes and HIV Test proportions from Study 2.

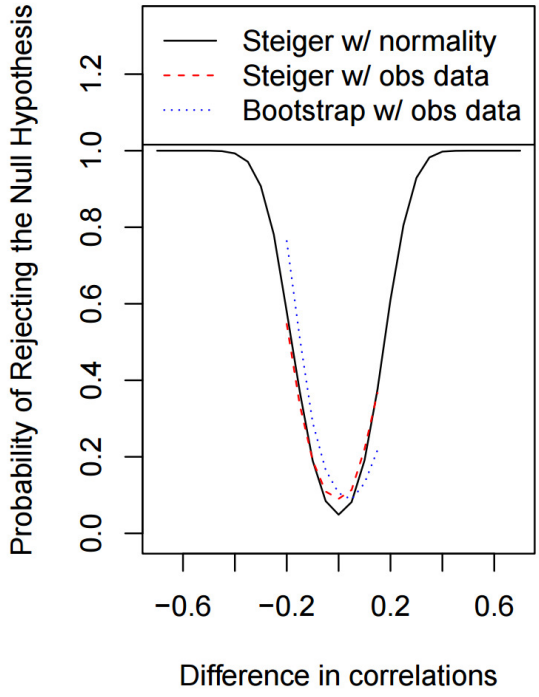

Figure 4. The power function for sample sizes and HIV Test proportions from Study 2.

with unrestricted sociosexual behavior, was openmindedness; however, this was not statistically significant. The personality trait that manifested in the opposite manner was psychopathy. This means that individuals with psychopathic tendencies are not getting tested for HIV at sufficient rates—they are insufficiently calibrating their HIV testing behavior, given their frequent short-term sexual behavior (see also: Erbelding et al., 2004). Narcissism followed a similar pattern, but not at a statistically significant level. An analysis of partial correlations (controlling for demographic factors), which is shown in Table 8, reduced all of the significant differences in partial correlations to non-significant levels, except for long-term mating orientation, which remained statistically significant. We must leave this puzzle about demographic factors in pieces, and invite researchers to put together the pieces in the future.

General Discussion

Across two studies, a research synthesis of those two studies, and a sensitivity check, we presented preliminary evidence for the personalities of people who get tested for HIV; we presented corroborating evidence for the personalities of people who tend to engage in unrestricted sociosexual behaviors; and we presented evidence regarding which traits are associated with HIV-testing calibration, given their level of unrestricted sociosexual risk-taking behaviors.

In Study 1, we pre-registered two hypotheses, namely that Information Avoidance Scale for HIV would be negatively associated with HIV Testing, and that narcissism would be associated negatively with HIV testing, too. Although neither of these hypotheses were consistent with the data, follow-up exploratory analyses revealed that narcissism may have a differential association with (a) less HIV Testing, and (b) more unrestricted sociosexual behavior, setting the stage for Study 2.

In Study 2, we pre-registered five hypotheses. Hypothesis 1, which was based on Study 1, was that neuroticism would be positively associated with HIV testing, but the results from Study 2 did not support this prediction. Hypothesis 2 stated that psychopathy would be positively associated with unrestricted sociosexual behaviors, and the results provided support for this hypothesis. Hypothesis 3 had three variations: Hypothesis 3A, 3B, and 3C specified that there would be a difference in the correlations between, on the one hand, the trait of interest (extraversion, narcissism, and positive irrational beliefs, respectively) and HIV testing, and, on the other hand, the trait of interest and unrestricted sociosexual behavior. For all three traits, we predicted that the correlation between the trait and HIV would be more negative, and the correlation between the trait and unrestricted sociosexual behavior would be more positive. This pattern was observed for narcissism (Hypothesis 3b), but not for the other two individual differences.

In the research synthesis, we explored all the valid data (total N = 319). People who got tested for HIV tended to be low in conscientiousness, higher in openmindedness, higher in Machiavellian qualities, and higher in psychopathy. People who engaged in unrestricted sociosexual behavior tended to be low in conscientiousness, low in agreeableness, higher in negative emotionality, higher in all three traits in the dark triad (Machiavellianism, narcissism, and psychopathy), and lower in long-term mating orientation.

The synthesis showed that several traits had a difference between (a) the correlation with HIV testing and (b) the correlation with unrestricted sociosexual behavior. For sim-

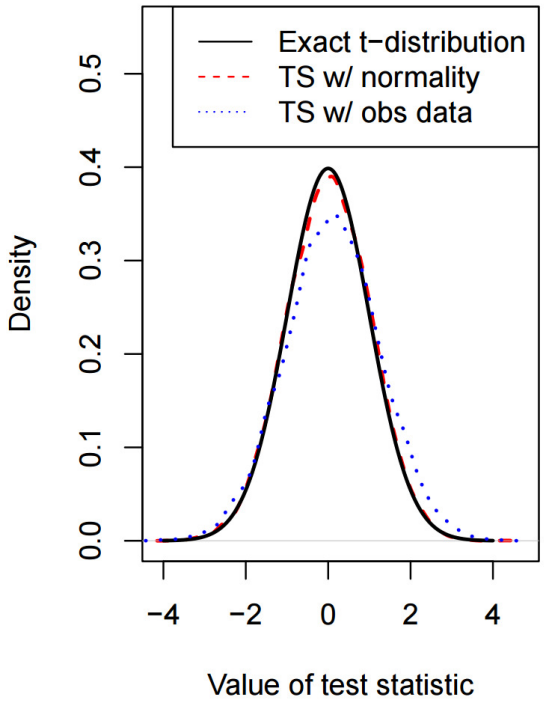

Figure 5. The density of the Steiger test statistic for sample sizes and HIV Test proportions from the research synthesis.

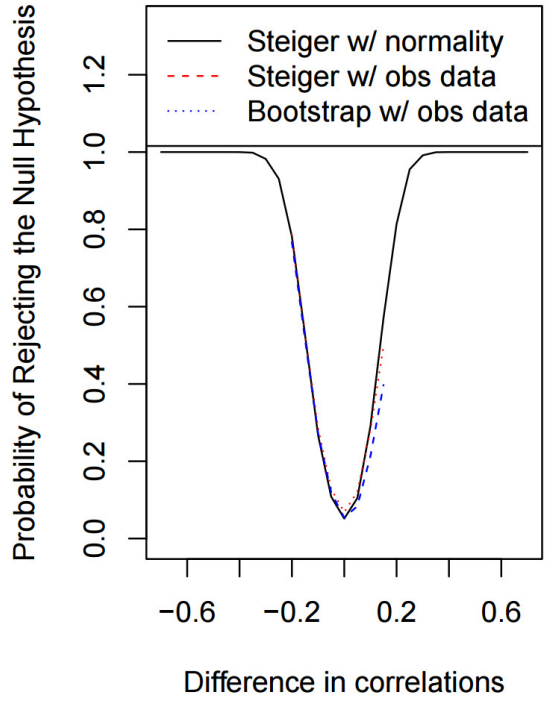

Figure 6. The power function for sample sizes and HIV Test proportions from the research synthesis.

plicity, we categorize them here as careful (i.e., particularly likely to get tested, given their relatively lower rates of unrestricted sociosexual behavior) and careless (markedly less likely to get tested, relative to their relatively higher rates of unrestricted sociosexual behavior). The careless traits were Machiavellianism, narcissism, and psychopathy; this means that Machiavellian, narcissistic, and psychopathic individuals are not getting tested enough, given how frequently they engage in short-term sexual behavior. The only significant careful trait was long-term mating orientation.

Strengths and Limitations

One of the key strengths of this paper is that we pre-registered hypotheses, namely, the hypothesis that psychopathic individuals would exhibit higher unrestricted sociosexual behavior, and the finding that narcissistic individuals would show a combination of (a) relatively low HIV testing, and (b) relatively high unrestricted sociosexual behavior. Largely because of the methodological choice to pre-register the hypotheses, these are the most convincing results from our project. Another major strength is that we measured (real) behavior, as prominent psychologists have called for (e.g., Baumeister et al., 2007).

Regarding constraints on generality (Simons et al., 2017), we tested these hypotheses in young, mostly heterosexual, undergraduate students in a rural area in a WEIRD culture [i.e., Western, Educated, Industrialized, Rich, and Democratic; Henrich, Heine, and Norenzayan (2010)]. Any of these WEIRD features of the sample could moderate the findings. One feature that doubles as a strength and a limitation is that the methods for the two studies differed in how far the participants had to walk or travel to get to the HIV testing site. In Study 1, the site was approximately 100 feet from the Phase 1 survey site; in Study 2, the site was the student health center on campus (about a 15 min walk from the Psychology building)—much farther than 100 feet. We do not know, of course, where the participants were taking the surveys in Study 2, and so estimating total distance to the HIV testing site is impossible. This is a limitation in that the methods from Study 2 manifested in a low number of participants who ended up getting tested (i.e., just 4 of 250 in Study 2, compared to 20 of 69 in Study 1); yet, it this a strength of Study 2 in that it reflects the real world processes that one must undertake to get tested for HIV, thus yielding better external validity.

Related to this, another limitation is the overall rate of testing. In our studies, the overall rate of testing was 7.5% (24 out of 319 participants got tested overall). This is lower than the annual rate of testing, which sits at 13% - 15% (Patel et al., 2020). We would recommend—for the sake of statistical power—that future work makes it easier for participants to receive testing. Apparently, 100 feet between the psychological assessment location and the HIV testing location, as was the case in Study 1, is too far. Other limitations include that we did not assess previous HIV testing, nor did we account for relationship status. One more limitation is that we did not assess the degree to which participants trusted the study procedures and staff; it is possible that participants may have trusted healthcare professionals more outside of the university setting (as there are obvious power differentials inside university settings, such as those between instructors and students).

Future Research

One other caveat is that the results depend on unrestricted sociosexual behavior constituting the sole element of the risk index for contracting HIV. To be sure, short-term sexual behavior is a risk factor in contracting HIV, but HIV can be contracted in other ways (e.g., sharing needles). Future research should focus on a comprehensive way to measure such risk. Some considerations include whether participants use sexual protection, engage in unsafe drug practices, and have heightened exposure to HIV in workplaces. Once a more general measure of risk of contracting HIV is established, it will be possible to run a similar analysis in comparing (a) HIV Testing and (b) general risk of contracting HIV. So this study could serve as a model to be improved upon in future work. Future research needs to develop interventions tailored to highly narcissistic and psychopathic individuals, encouraging them to get tested for HIV, especially given that these individuals seem to be more unrestricted sexually. Some promising research on personality-based targeted advertising has begun to flourish (Matz et al., 2017)—including some work showing certain advertisements work better for extraverts (e.g., depicting people in lively parties). This knowledge could help in creating personality-based targeted advertisements or public service announcements that encourage at-risk individuals to get tested.

Additionally, previous work shows that a fruitful paradigm using the Theory of Planned Behavior (Ajzen, 1991) could elucidate predictors of HIV testing (Meadowbrooke et al., 2014). In particular, it seems intentions to get tested could be a key variable in understanding who engages in testing behavior (Meadowbrooke et al., 2014). We encourage researchers to measure this.

Still, a cautionary tale emerged from our project; the Information Avoidance Scale for HIV that we created did not show predictive validity (in the research synthesis). This suggests that, at least for HIV diagnostics, people may not know whether they are actually inclined to avoid information about it in the near future. This is a blind spot in self-knowledge (see also: Vazire & Carlson, 2010)—a potentially fatal one—worthy of future study. One vexing question is: Why don't people know whether they will get tested in the very near future? After all, participants merely had to predict their own behavior at most a few weeks into the future (and the prediction interval was less than an hour for Study 1). This is a problem for researchers to solve.

Conclusions

In conclusion, showed showed that extraverted, narcissistic, and psychopathic people tend to show a significant difference between their (unlikely) HIV testing behavior and their (likely) unrestricted sociosexual behavior. Bluntly stated, such people are having more short-term sex without being inclined to get tested for HIV. This means that they aren't calibrated, and HIV may go undetected.

Consistent with independent research groups (e.g., Ali & Chamorro-Premuzic, 2010; Jones & de Roos, 2017), we found that psychopathic individuals tend to engage in more unrestricted sociosexual behavior; this pattern also held for narcissistic people in our sample, as predicted by previous empirical studies (Campbell & Foster, 2002; Dufner et al., 2013; Foster et al., 2006) and integrative theoretical work (Holtzman & Donnellan, 2015; Holtzman & Strube, 2011; Martin et al., 2013; Widman & McNulty, 2011). So, these two traits in the externalizing spectrum are coming into focus here (Erbelding et al., 2004); narcissistic and psychopathic individuals likely increase HIV spread. Future work should investigate which specific externalizing spectrum traits—such as callousness, charm, entitlement, grandiosity, sensation-seeking, and urgency—put people at risk for undetected sexual transmission of HIV.

Author note

Study 1 was conceptualized in 2013 at the Department of Psychology at Georgia Southern University, between NSH and Professor Karen Z. Naufel.

Contributions

Contributed to conception and design: NSH, JNS, SWS
Contributed to acquisition of data: NSH, SWS, JNS
Contributed to analysis and interpretation of data: NSH, SMG, SWC
Drafted and/or revised the article: NSH, JNS, SMG, SWS, SWC, ANG
Approved the submitted version for publication: NSH, JNS, SWS, SWC, SMG

Acknowledgements

I. Johnson, C. Lococo, L. Rush, E. Demsky, M. Dolphyn, and Georgia Southern Health Services helped obtain data.

Funding

Georgia Southern College of Behavioral and Social Sciences partially funded this work through an internal start-up fund to NSH. No other funding was obtained for these studies.

Competing Interests

None of the authors have competing interests.

Data Accessibility Statement

All materials, participant data (except demographic data, which could allow participants to be identified), and analysis scripts in R Markdown can be found on this paper's project page on the Open Science Framework [https://osf.io/hsaqg/]. This paper was compiled using PAPAJA (Aust & Barth, 2021, http://frederikaust.com/papaja_man/) using R Markdown, and so running the scripts will require installment of that software.

Submitted: June 03, 2022 PDT, Accepted: July 04, 2023 PDT

References

Aalsma, M. C., Lapsley, D. K., & Flannery, D. J. (2006). Personal fables, narcissism, and adolescent adjustment. *Psychology in the Schools*, *43*(4), 481–491. https://doi.org/10.1002/pits.20162

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-t

Ali, F., & Chamorro-Premuzic, T. (2010). The dark side of love and life satisfaction: Associations with intimate relationships, psychopathy and machiavellianism. *Personality and Individual Differences*, *48*(2), 228–233. https://doi.org/10.1016/j.paid.2009.10.016

Aust, F., & Barth, M. (2018). *papaja: Create APA manuscripts with R Markdown*. https://github.com/crsh/papaja

Aust, F., & Barth, M. (2021, May 14). *papaja: Reproducible APA manuscripts with R Markdown*. https://frederikaust.com/papaja_man/

Aust, F., Diedenhofen, B., Ullrich, S., & Musch, J. (2013). Seriousness checks are useful to improve data validity in online research. *Behavior Research Methods*, *45*(2), 527–535. https://doi.org/10.3758/s13428-012-0265-2

Baumeister, R. F., Vohs, K. D., & Funder, D. C. (2007). Psychology as the science of self-reports and finger movements: Whatever happened to actual behavior? *Perspectives on Psychological Science*, *2*(4), 396–403. https://doi.org/10.1111/j.1745-6916.2007.00051.x

Bjekic, M., Lecic-Tosevski, D., Vlajinac, H., & Marinkovic, J. (2002). Personality dimensions of sexually transmitted disease repeaters assessed with the millon clinical multiaxial inventory. *Journal of the European Academy of Dermatology and Venereology*, *16*(1), 63–65. https://doi.org/10.1046/j.1468-3083.2002.00367.x

Bond, L., Lauby, J., & Batson, H. (2005). HIV testing and the role of individual- and structural-level barriers and facilitators. *AIDS Care*, *17*(2), 125–140. https://doi.org/10.1080/09540120512331325653

Bonett, D. G., & Wright, T. A. (2000). Sample size requirements for estimating Pearson, Kendall and Spearman correlations. *Psychometrika*, *65*(1), 23–28. https://doi.org/10.1007/bf02294183

Campbell, W. K., & Foster, C. A. (2002). Narcissism and commitment in romantic relationships: An investment model analysis. *Personality and Social Psychology Bulletin*, *28*(4), 484–495. https://doi.org/10.1177/0146167202287006

CDC. (n.d.). *HIV and AIDS in the workplace*. https://www.cdc.gov/hiv/pdf/workplace/cdc-hiv-and-aids-and-the-workplace.pdf

CDC. (2022). *Basic statistics*. http://www.cdc.gov/hiv/library/reports/hiv-surveillance.html

Collard, J. J., Cummins, R. A., & Fuller-Tyskiewicz, M. (2016). Measurement of positive irrational beliefs (positive cognitive illusions). *Journal of Happiness Studies*, *17*(3), 1069–1088. https://doi.org/10.1007/s10902-015-9632-x

Dufner, M., Rauthmann, J. F., Czarna, A. Z., & Denissen, J. J. A. (2013). Are Narcissists Sexy? Zeroing in on the Effect of Narcissism on Short-Term Mate Appeal. *Personality and Social Psychology Bulletin*, *39*(7), 870–882. https://doi.org/10.1177/0146167213483580

Erbelding, E. J., Hutton, H. E., Zenilman, J. M., Hunt, W. P., & Lyketsos, C. G. (2004). The prevalence of psychiatric disorders in sexually transmitted disease clinic patients and their association with sexually transmitted disease risk. *Sexually Transmitted Diseases*, *31*(1), 8–12. https://doi.org/10.1097/01.olq.0000105326.57324.6f

Everett, M. W., & Palmgreen, P. (1995). Influences of sensation seeking, message sensation value, and program context on effectiveness of anticocaine public service announcements. *Health Communication*, *7*(3), 225–248. https://doi.org/10.1207/s15327027hc0703_3

Foster, J. D., Shrira, I., & Campbell, W. K. (2006). Theoretical models of narcissism, sexuality, and relationship commitment. *Journal of Social and Personal Relationships*, *23*(3), 367–386. https://doi.org/10.1177/0265407506064204

Foster, J. D., & Trimm, R. F., IV. (2008). On being eager and uninhibited: Narcissism and approach–avoidance motivation. *Personality and Social Psychology Bulletin*, *34*(7), 1004–1017. https://doi.org/10.1177/0146167208316688

Friedman, H. S. (2000). Long-term relations of personality and health: Dynamisms, mechanisms, tropisms. *Journal of Personality*, *68*(6), 1089–1107. https://doi.org/10.1111/1467-6494.00127

Health, U. S. D. of, & Services, H. (2021). *HIV national strategic plan for the united states: A roadmap to end the epidemic 2021-2025*. https://files.hiv.gov/s3fs-public/HIV-National-Strategic-Plan-2021-2025.pdf

Henrich, J., Heine, S. J., & Norenzayan, A. (2010). The weirdest people in the world? *Behavioral and Brain Sciences*, *33*(2–3), 61–83. https://doi.org/10.1017/s0140525x0999152x

Hepper, E. G., Hart, C. M., Meek, R., Cisek, S., & Sedikides, C. (2014). Narcissism and empathy in young offenders and non–offenders. *European Journal of Personality*, *28*(2), 201–210. https://doi.org/10.1002/per.1939

Hernandez-Huerta, D., Parro-Torres, C., Madoz-Gurpide, A., Perez-Elias, M. J., Moreno-Guillen, S., & Ochoa-Mangado, E. (2021). Personality and adherence to antiretroviral therapy in HIV-infected adult patients. *Journal of Psychosomatic Research*, *144*, 110413. https://doi.org/10.1016/j.jpsychores.2021.110413

Hightow, L. B., Miller, W. C., Leone, P. A., Wohl, D., Smurzynski, M., & Kaplan, A. H. (2003). Failure to return for HIV posttest counseling in an STD clinic population. *AIDS Education and Prevention*, *15*(3), 282–290. https://doi.org/10.1521/aeap.15.4.282.23826

Holtzman, N. S., & Donnellan, M. B. (2015). The roots of narcissus: Old and new models of the evolution of narcissism. In V. Zeigler-Hill, L. L. M. Welling, & T. K. Shackelford (Eds.), *Evolutionary Perspectives on Social Psychology* (pp. 479–489). Springer. https://doi.org/10.1007/978-3-319-12697-5_36

Holtzman, N. S., & Strube, M. J. (2011). The intertwined evolution of narcissism and short-term mating. In *The Handbook of Narcissism and Narcissistic Personality Disorder* (pp. 210–220). John Wiley & Sons, Ltd. https://doi.org/10.1002/9781118093108.ch19

Holtzman, N. S., & Strube, M. J. (2013). Above and beyond short-term mating, long-term mating is uniquely tied to human personality. *Evolutionary Psychology*, *11*(5), 147470491301100514. https://doi.org/10.1177/147470491301100514

Howell, J. L., & Shepperd, J. A. (2016). Establishing an information avoidance scale. *Psychological Assessment*, *28*(12), 1695–1708. https://doi.org/10.1037/pas0000315

Ironson, G. H., O'Cleirigh, C., Schneiderman, N., Weiss, A., & Costa, P. T., Jr. (2008). Personality and HIV disease progression: Role of NEO-PI-r openness, extraversion, and profiles of engagement. *Psychosomatic Medicine*, *70*(2), 245–253. https://doi.org/10.1097/psy.0b013e31816422fc

Jackson, J. J., & Kirkpatrick, L. A. (2007). The structure and measurement of human mating strategies: Toward a multidimensional model of sociosexuality. *Evolution and Human Behavior*, *28*(6), 382–391. https://doi.org/10.1016/j.evolhumbehav.2007.04.005

Johnson, M. O. (2000). Personality correlates of HIV vaccine trial participation. *Personality and Individual Differences*, *29*(3), 459–467. https://doi.org/10.1016/s0191-8869(99)00206-8

Jonason, P. K., Baughman, H. M., Carter, G. L., & Parker, P. (2015). Dorian gray without his portrait: Psychological, social, and physical health costs associated with the dark triad. *Personality and Individual Differences*, *78*, 5–13. https://doi.org/10.1016/j.paid.2015.01.008

Jones, D. N., & de Roos, M. S. (2017). Differential reproductive behavior patterns among the dark triad. *Evolutionary Psychological Science*, *3*(1), 10–19. https://doi.org/10.1007/s40806-016-0070-8

Jones, D. N., & Paulhus, D. L. (2014). Introducing the short dark triad (SD3): A brief measure of dark personality traits. *Assessment*, *21*(1), 28–41. https://doi.org/10.1177/1073191113514105

Levy, M. E., Wilton, L., Phillips, G., II, Glick, S. N., Kuo, I., Brewer, R. A., Elliott, A., Watson, C., & Magnus, M. (2014). Understanding structural barriers to accessing HIV testing and prevention services among black men who have sex with men (BMSM) in the united states. *AIDS and Behavior*, *18*(5), 972–996. https://doi.org/10.1007/s10461-014-0719-x

Martin, A. M., Benotsch, E. G., Lance, S. P., & Green, M. (2013). Transmission risk behaviors in a subset of HIV-positive individuals: The role of narcissistic personality features. *Personality and Individual Differences*, *54*(2), 256–260. https://doi.org/10.1016/j.paid.2012.09.006

Matz, S. C., Kosinski, M., Nave, G., & Stillwell, D. J. (2017). Psychological targeting as an effective approach to digital mass persuasion. *Proceedings of the National Academy of Sciences*, *114*(48), 12714–12719. https://doi.org/10.1073/pnas.1710966114

McCrae, R. R., & Costa, P. T., Jr. (1994). The stability of personality: Observations and evaluations. *Current Directions in Psychological Science*, *3*(6), 173–175. https://doi.org/10.1111/1467-8721.ep10770693

Meadowbrooke, C. C., Veinot, T. C., Loveluck, J., Hickok, A., & Bauermeister, J. A. (2014). Information behavior and HIV testing intentions among young men at risk for HIV/AIDS. *Journal of the Association for Information Science and Technology*, *65*(3), 609–620. https://doi.org/10.1002/asi.23001

Meyerson, B., Barnes, P., Emetu, R., Bailey, M., Ohmit, A., & Gillespie, A. (2014). Institutional and structural barriers to HIV testing: Elements for a theoretical framework. *AIDS Patient Care and STDs*, *28*(1), 22–27. https://doi.org/10.1089/apc.2013.0238

Mischel, W., Shoda, Y., & Rodriguez, M. L. (1989). Delay of gratification in children. *Science*, *244*(4907), 933–938. https://doi.org/10.1126/science.2658056

O'Cleirigh, C., Perry, N. S., Taylor, S. W., Coleman, J. N., Costa, P. T., Jr., Mayer, K. H., & Safren, S. A. (2018). Personality traits and adaptive HIV disease management: Relationships with engagement in care and condomless anal intercourse among highly sexually active sexual minority men living with HIV. *LGBT Health*, *5*(4), 257–263. https://doi.org/10.1089/lgbt.2016.0065

Patel, D., Johnson, C. H., Krueger, A., Maciak, B., Belcher, L., Harris, N., & DiNenno, E. A. (2020). Trends in HIV testing among US adults, aged 18–64 years, 2011–2017. *AIDS and Behavior*, *24*(2), 532–539. https://doi.org/10.1007/s10461-019-02689-0

Penke, L., & Asendorpf, J. B. (2008). Beyond global sociosexual orientations: A more differentiated look at sociosexuality and its effects on courtship and romantic relationships. *Journal of Personality and Social Psychology*, *95*(5), 1113–1135. https://doi.org/10.1037/0022-3514.95.5.1113

Pinkerton, S. D., & Abramson, P. R. (1995). Decision making and personality factors in sexual risk-taking for HIV/AIDS: A theoretical integration. *Personality and Individual Differences*, *19*(5), 713–723. https://doi.org/10.1016/0191-8869(95)00109-j

Plechatá, A., Makransky, G., & Böhm, R. (2022). Can extended reality in the metaverse revolutionise health communication? *NPJ Digital Medicine*, *5*(1), 132. https://doi.org/10.1038/s41746-022-00682-x

R Core Team. (2018). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. https://www.R-project.org/

Roberts, B. W., Kuncel, N. R., Shiner, R., Caspi, A., & Goldberg, L. R. (2007). The power of personality: The comparative validity of personality traits, socioeconomic status, and cognitive ability for predicting important life outcomes. *Perspectives on Psychological Science*, *2*(4), 313–345. https://doi.org/10.1111/j.1745-6916.2007.00047.x

Robins, R. W., Hendin, H. M., & Trzesniewski, K. H. (2001). Measuring global self-esteem: Construct validation of a single-item measure and the rosenberg self-esteem scale. *Personality and Social Psychology Bulletin*, *27*(2), 151–161. https://doi.org/10.1177/0146167201272002

Rodger, A. J., Cambiano, V., Bruun, T., Vernazza, P., Collins, S., Degen, O., Corbelli, G. M., Estrada, V., Geretti, A. M., Beloukas, A., Raben, D., Coll, P., Antinori, A., Nwokolo, N., Rieger, A., Prins, J. M., Blaxhult, A., Weber, R., Van Eeden, A., … Janeiro, N. (2019). Risk of HIV transmission through condomless sex in serodifferent gay couples with the HIV-positive partner taking suppressive antiretroviral therapy (PARTNER): Final results of a multicentre, prospective, observational study. *The Lancet*, *393*(10189), 2428–2438. https://doi.org/10.1016/s0140-6736(19)30418-0

Schlam, T. R., Wilson, N. L., Shoda, Y., Mischel, W., & Ayduk, O. (2013). Preschoolers' delay of gratification predicts their body mass 30 years later. *The Journal of Pediatrics*, *162*(1), 90–93. https://doi.org/10.1016/j.jpeds.2012.06.049

Shoda, Y., Mischel, W., & Peake, P. K. (1990). Predicting adolescent cognitive and self-regulatory competencies from preschool delay of gratification: Identifying diagnostic conditions. *Developmental Psychology*, *26*(6), 978–986. https://doi.org/10.1037/0012-1649.26.6.978

Simons, D. J., Shoda, Y., & Lindsay, D. S. (2017). Constraints on generality (COG): A proposed addition to all empirical papers. *Perspectives on Psychological Science*, *12*(6), 1123–1128. https://doi.org/10.1177/1745691617708630

Soto, C. J., & John, O. P. (2017). The next Big Five Inventory (BFI-2): Developing and assessing a hierarchical model with 15 facets to enhance bandwidth, fidelity, and predictive power. *Journal of Personality and Social Psychology*, *113*(1), 117–143. https://doi.org/10.1037/pspp0000096

Specht, J., Egloff, B., & Schmukle, S. C. (2011). Stability and change of personality across the life course: The impact of age and major life events on mean-level and rank-order stability of the Big Five. *Journal of Personality and Social Psychology*, *101*(4), 862–882. https://doi.org/10.1037/a0024950

Steiger, J. H. (1980). Tests for comparing elements of a correlation matrix. *Psychological Bulletin*, *87*(2), 245–251. https://doi.org/10.1037/0033-2909.87.2.245

Sweeny, K., Melnyk, D., Miller, W., & Shepperd, J. A. (2010). Information avoidance: Who, what, when, and why. *Review of General Psychology*, *14*(4), 340–353. https://doi.org/10.1037/a0021288

Vazire, S., & Carlson, E. N. (2010). Self-knowledge of personality: Do people know themselves? *Social and Personality Psychology Compass*, *4*(8), 605–620. https://doi.org/10.1111/j.1751-9004.2010.00280.x

Weston, S. J., Hill, P. L., Edmonds, G. W., Mroczek, D. K., & Hampson, S. E. (2019). No evidence of "healthy neuroticism" in the hawaii personality and health cohort. *Annals of Behavioral Medicine*, *53*(5), 426–441. https://doi.org/10.1093/abm/kay055

Widman, L., & McNulty, J. K. (2011). Narcissism and sexuality. *The Handbook of Narcissism and Narcissistic Personality Disorder: Theoretical Approaches, Empirical Findings, and Treatments*, 351–359. https://doi.org/10.1002/9781118093108.ch31

Supplementary Materials

Peer Review History

Download: https://collabra.scholasticahq.com/article/87458-individual-difference-correlates-of-being-sexually-unrestricted-yet-declining-an-hiv-test/attachment/178749.docx?auth_token=oMIBhKueEYdTMktM2jgE