

# DATING APP USERS AFTER TWO YEARS: A DARK TRIAD AMPLIFICATION

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## ABSTRACT

A 2-year longitudinal study examined how dating app use ( $N = 82, 36$  women) affects changes in personality (i.e., the Dark Triad and Big Five traits), and visual social media use (i.e., dating apps, Instagram). Dating app users were higher in narcissism and Machiavellianism after two years but not in the Big Five traits. Early time and sessions on dating apps were associated with more sessions on dating apps, more time on Instagram, and higher narcissism later. Men increased in narcissism, women decreased in extraversion, openness, conscientiousness, and increased in agreeableness. The use of dating apps affects personality into an antagonistic direction, especially women.

DARK TRIAD  
BIG FIVE  
LONGITUDINAL  
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**KEYWORDS**

25 METHOD  
26 RESULTS  
26 DISCUSSION  
27 LIMITATIONS, FUTURE DIRECTIONS  
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# UŻYTKOWNICY APLIKACJI RANDKOWYCH PO DWÓCH LATACH: WYŻSZY POZIOM CECH CIEMNEJ TRIADY

## ABSTRAKT

W dwuletnim badaniu podłużnym zbadano, w jaki sposób korzystanie z aplikacji randkowych (N = 82, 36 kobiet) wpływa na zmiany osobowości (tj. cechy Ciemnej Triady i Wielkiej Piątki) oraz korzystanie z mediów społecznościowych (tj. aplikacje randkowe, Instagram). Użytkownicy aplikacji randkowych mieli wyższy poziom narcyzmu i makiawelizmu po dwóch latach, ale nie cechy Wielkiej Piątki. Wczesny czas i sesje w aplikacjach randkowych wiązały się z większą liczbą sesji w aplikacjach randkowych, więcej czasu na Instagramie i wyższym narcyzmem później. U mężczyzn zwiększył się narcyzm, podczas gdy u kobiet zmniejszyła się ekstrawersja, otwartość, sumienność i wzrosła ugodowość. Korzystanie z aplikacji randkowych wpływa na osobowość w antagonistycznym kierunku, szczególnie w przypadku kobiet.

## SŁOWA KLUCZOWE

Mroczna Triada, Wielka Piątka, badanie podłużne, aplikacje randkowe, Instagram, media społecznościowe

Dating app use is associated with high Dark Triad traits (i.e., narcissism, Machiavellianism, psychopathy; Jonason & Bulyk, 2020; Sevi, 2019). Narcissists are more frequently picked and therefore overrepresented on dating apps, Machiavellians use dating apps for improving their flirting skills and further agentic reasons, while psychopaths search hook-ups (Freyth & Batinic, 2021; Lyons et al., 2020; Sevi, 2019). Associations of the Big Five traits and dating app use are less clear (Freyth & Batinic, 2021). As individuals chose their environment to fit their personality (Roberts & Robin, 2004), this environment and frequently repeated behaviors (Hennecke et al., 2014), can influence traits. In case of dating apps, it is still unknown if personality change is affected by the selected environment itself (Roberts & Robin, 2004). As personality should be stable over two years (Weisberg et al., 2011; Klimstra et al., 2020), potential changes should be attributed to this environment.

Dating apps offer a nearly infinite pool of mates, are completely based on positive choices (i.e., “matches”), thus leaving out negative feedback by experiencing rejection—this could favor an increase in the Dark Triad traits. And despite men and women use the same technology, different mating preferences (Buss, 1989) might lead to different changes: While women present their beauty on profile-photos, receive positive feedback and uncountable messages, men might get disappointed by non-responding women and behave more opportunistic once they are on a date organized via dating apps. Similar principles apply to Instagram, which could supplement dating app use because both visual social media unifies a short-term mating-tendency (i.e., high Dark Triad traits; Freyth et al., 2023; Jonason & Bulyk, 2020).

This 2-year longitudinal study among dating app users investigates the effect of dating apps use on the Dark Triad traits, the Big Five traits, and the use of visual social media. A general increased short-term mating-tendency (i.e., Dark Triad traits) is expected because of the person-environment fit. Moderating for sex and for continuous/non-continuous use (i.e., those who still used/not used dating apps in 2020) enables identifying further effects of use.

## METHOD

### PARTICIPANTS AND PROCEDURE

Data was provided by a German tracked online-panel (Beatery by Respondi), for dating apps (i.e., Badoo, Tinder, Lovoo) users of 2018, providing summed usage time of the last 3 months (April/May/June 2018; July/August/September 2020; see Freyth & Batinic, 2021). We reached 82 tracked users (5€ incentive) after two years ( $M[SD] = 40.61[12.41]$  years). Of them (46 men, 90% heterosexual) 41 were in a committed relationship, 41 were not. Use of dating apps and Instagram (2020 only) was tracked for three months. After two years there were 20 continuous users, 57 used Instagram. Minimal sample size to detect medium effects (Szucs & Ioannidis, 2021) was calculated with 55 (power = 0.95,  $f = 0.46$ ,  $\alpha = .05$ )<sup>1</sup>.

1 Online calculator: [https://www.statskingdom.com/sample\\_size\\_manova.html](https://www.statskingdom.com/sample_size_manova.html)

## MEASURES

We used the German Big-Five-Inventory-Short (15 items; Schupp & Gerlitz, 2008). Participants rated their agreement (1 = *totally disagree*, 7 = *totally agree*; “I am someone who...”) on neuroticism (e.g., “...gets nervous easily”;  $\omega = .68$ ), extraversion (e.g., “...is talkative”,  $\omega = .80$ ), openness (e.g., “...has an active imagination”,  $\omega = .77$ ), agreeableness (e.g., “...has a forgiving nature”,  $\omega = .56$ ), and conscientiousness (e.g., “...does thing efficiently”,  $\omega = .63$ ). Items were average into scores.

We used the German Naughty Nine scale (9 items; K ufner et al., 2014). Participants assessed their agreement (1 = *totally disagree*, 9 = *totally agree*) on narcissism (e.g., “I tend to strive for prestige and status”,  $\omega = .82$ ), Machiavellianism (e.g., “I have used flattery to impose my will”,  $\omega = .80$ ), and psychopathy (e.g., “I tend not to care about the moral of my actions”,  $\omega = .69$ ). We average the items into indexes.

Usage time was measured by Respondi and reported in average daily minutes of dating app (time  $M(SD) = 12.80(31.35)$ , sessions  $M(SD) = 0.96(2.29)$ ) and Instagram use (time  $M(SD) = 8.51(13.04)$ , sessions  $M(SD) = 2.85(4.99)$ ). Data was skewed, so time and session were naturally log-transformed.

## RESULTS

First, tests for personality changes were conducted. Overall, narcissism and Machiavellianism increased, and neuroticism decreased over two years (Table 1). In men Machiavellianism slightly increased. Among women higher narcissism was reported after two years. Non-continuous users were higher in neuroticism than continuous users.

Then associations with dating app use were tested. Time and sessions of dating app use in 2018 did not correlated with the magnitude of trait-change (Table 2), but with increased sessions on dating apps and time on Instagram after two years. Moderations by sex and continuous dating app use were tested using Fisher  $z$ -test. Men spending more time and sessions on dating apps were more narcissistic after two years compared to women. Women spending more time and sessions on dating apps were less extraverted, open, and conscientious, but more agreeable after two years than men. Spending more time and sessions on dating apps among continuous users were characterized as more narcissistic and less Machiavellian than non-continuous users, whereas non-continuous users were less extraverted than continuous users after two years. Trait-intercorrelations are reported in the supplements.

## DISCUSSION

Over two years, it was examined how dating app use affects changes in the Dark Triad traits, the Big Five traits, and dating app and Instagram use. One fourth of users still used dating apps after two years. Overall, dating app users were higher in narcissism and Machiavellianism after two years. Spending more time and sessions on dating apps were more narcissistic after two years. Men spending more time and sessions on dating apps were more narcissistic than women after two years, whereas women with more time and sessions on dating apps were less extraverted, open, and more agreeable compared to men after two years. Over a, for adults, relatively short time of two years central traits such as the Big Five traits (Weisberg et al., 2011) and the Dark Triad traits (Klimstra et al., 2020) were expected to stay stable. Therefore, observed personality changes are attributed to environmental factors, which here

was the use of dating apps. The most obvious changes were amplifications of narcissism and Machiavellianism, and with that short-term mating tendencies. Yet, moderations showed effects in the Big Five traits too, interestingly mostly among women. Women become but more compliant (i.e., agreeable) but less assertive (i.e., extraverted), explorative (i.e., openness), and self-disciplined (i.e., conscientious), and so potentially more susceptible for opportunistic mating. These changes are contrary to age effects (Weisberg et al., 2011), thus environmental attribution. They might be caused by rewarding women for showing visual cues in a short-term mating environment by an instant and endless availability of compliments and sex partners, which in this scale would hardly be possible in the real world.

Non-continuous users seemed to compensate dating apps with Instagram. Lower extraversion and agreeableness than continuous users might indicate identical except for going, or at least organizing, dates with strangers on dating apps. Findings might indicate that visual social media—not only dating apps—attract deceptive individuals looking for opportunistic mating environments (Jonason & Bulyk, 2020). In environments favoring virtue signaling and approval like social media (Grubbs et al., 2019), the Dark Triad traits are beneficial: When perceived as rare but advantageous they appear attractive (Brisson, 2018) and are therefore desirable as mates. Thus, “dark” individuals stay on these apps as they appear to be an adaptive fit to their personalities.

The Dark Triad traits are short-term mating strategies, whereof Machiavellians consider more future consequences but still suffer from low impulse control (Jonason & Tost, 2010). They probably return into the online mating pool when things get complicated with their partners, or when caught cheating (Sevi et al., 2020). Maybe, Machiavellians are just the best long-term strategists among short-term oriented individuals (Lyons et al., 2020). Thus, an increase in Machiavellianism might be a consequence of learning new deceitful dating strategies while using visual social media like dating apps.

## LIMITATIONS, FUTURE DIRECTIONS & CONCLUSION

Despite having captured a rare sample and providing longitudinal data, this study suffers from some limitations. Mainly, the user-dropout during the beginning of the crisis 2020 was impossible to expect, but the a-priori study design was kept and not filled up with other, non-tracked users. Future studies need larger sample sizes for more between-group comparisons. To ensure a high participation rate short scales were used, but this way facets like self-centered antagonism, meanness, disinhibition, and withdrawal remained unexamined to investigate more specific affects in men and women (Freyth et al., 2023; Weisberg et al., 2011). Future research should study longer intervals, changes in individuals unexperienced with dating apps, changes in using motives and mate choices, the role of psychopathy, and interactional effects between sex and continuous use.

First-time longitudinal study among dating app users investigated changes in personality and visual social media use after two years. Overall, the Dark Triad traits were amplified, the Big Five traits stayed stable. In women an increased antisocial tendency was observed. Previous dating apps use was later supplemented by Instagram use via their shared underlying short-term mating-oriented character. Given increased opportunistic tendencies, the future of dating carries large-scale consequences, especially for and through women.

**Table 1. Changes from 2018 to 2020 in traits**

	Narcissism	Machiavellianism	Psychopathy	Neuroticism	Extraversion	Openness	Agreeableness	Conscientiousness
<i>Overall</i>								
M (SD) 2018	3.36 (1.52)	2.68 (1.36)	2.69 (1.22)	4.04 (1.16)	4.48 (1.33)	4.88 (1.23)	5.09 (0.92)	5.64 (0.95)
M (SD) 2020	3.72 (1.98)	3.06 (1.80)	2.78 (1.69)	3.78 (1.32)	4.56 (1.55)	4.83 (1.41)	5.26 (0.99)	5.67 (1.00)
t	-2.44*	-2.26*	-0.06	3.08*	-0.71	0.57	-1.48	-0.54
d	-0.27	-0.25	-0.07	0.34	-0.08	0.06	-0.17	-0.06
<i>Men</i>								
M (SD) 2018	3.19 (1.39)	2.94 (1.32)	3.03 (1.15)	3.78 (1.13)	4.46 (1.32)	4.84 (1.25)	5.09 (0.99)	5.59 (1.01)
M (SD) 2020	3.45 (1.76)	3.29 (1.91)	3.21 (1.70)	3.47 (1.32)	4.43 (1.40)	4.77 (1.53)	5.19 (0.98)	5.64 (1.18)
t	-1.32	-1.70 <sup>†</sup>	-0.84	2.52*	0.26	0.46	-0.45	-0.39
d	-0.2	-0.26	-0.13	0.37	0.04	0.07	-0.07	-0.06
<i>Women</i>								
M (SD) 2018	3.58 (1.65)	2.35 (1.37)	2.25 (1.20)	4.37 (1.13)	4.52 (1.36)	4.92 (1.23)	5.10 (0.84)	5.70 (0.89)
M (SD) 2020	4.06 (2.21)	2.78 (1.63)	2.24 (1.54)	4.18 (1.22)	4.72 (1.73)	4.90 (1.26)	5.34 (1.00)	5.72 (0.97)
t	-2.10*	-1.46	0.07	1.75 <sup>†</sup>	-1.22	0.35	-1.75 <sup>†</sup>	-0.36
d	-0.36	-0.25	0.01	0.30	-0.21	0.06	-0.30	-0.06
<i>2020: Continuous vs. Non-continuous users</i>								
M (SD) non-cont.	3.70 (2.07)	3.08 (1.80)	2.67 (1.68)	3.99 (1.27)	4.55 (1.59)	4.81 (1.22)	5.26 (1.00)	5.73 (0.96)
M (SD) continuous	3.79 (1.74)	3.00 (1.84)	3.12 (1.74)	3.13 (1.28)	4.58 (1.43)	4.87 (1.93)	5.23 (0.96)	5.52 (1.14)
t	-0.17	0.18	-1.01	2.61*	-0.09	-0.14	0.11	0.81
d	-0.04	0.05	-0.27	0.67	-0.02	-0.04	0.03	0.21

<sup>†</sup> < .10, \*  $p < .05$ .

**Table 2. Correlations of dating app use 2018 (time/sessions) with personality change ( $\Delta$ ) and dating app/Instagram use 2020, Fisher's z-test for moderation**

	Overall	Men	Women	z (sex)	Continuous Users	Non-continuous users	z (continuity)
<i><math>\Delta</math> trait-change</i>							
Narcissism	.04/.18	.60*/.59*	-.33/-.12	4.48*/3.45*	.49†/.58*	-.09/.06	2.14*/2.06*
Machiavellianism	-.19/-.22	-.14/-.24	-.20/-.18	0.27/-0.27	-.66*/-.60*	.03/-.02	-2.81*/-2.30
Psychopathy	-.05/-.11	-.10/-.21	.13/.14	-1.00/-1.53	-.33/-.32	-.02/-.11	-1.10/-1.53
Neuroticism	-.15/-.16	-.16/-.21	-.27/-.23	0.50/0.09	.07/-.07	-.18/-.08	0.86/0.03
Extraversion	-.14/-.13	.27/.30	-.55*/-.58*	3.87*/4.20*	.23/.29	-.36/-.40†	2.09*/2.47*
Openness	-.11/-.11	.06/<.01	-.52*/-.40	2.75*/1.87†	.22/.16	-.31/-.24	1.86†/1.39
Agreeableness	.27/-.29	-.09/.01	.65*/.60*	-3.74*/-2.95*	.08/.07	.37†/.42†	-1.05/-1.02
Conscientiousness	.02/.05	.17/.20	-.28/-.25	1.99*/1.98*	.29/.27	-.04/.05	1.16/0.77
<i>Dating apps</i>							
Time	.21/.02	.53†/.26	n.a./n.a.	n.a./n.a.	.21/-.02	n.a./n.a.	n.a./n.a.
Sessions	.32†/.31†	.49*/.48*	.26/.27	1.17/1.06	.38/.25	n.a./n.a.	n.a./n.a.
<i>Instagram</i>							
Time	.36*/.45*	.29/.43	.40/.44	-0.86/-0.05	.27/.39	.33/.41	-0.23/-0.80
Sessions	.09/.15	.14/.21	<.01/.05	0.61/0.71	.18/.29	-.17/-.17	1.21/1.62

Note:  $\Delta$  = 2020-2018;  $p < .10$ , \*  $p < .05$ ; calculated online (<http://quantpsy.org/corrtest/corrtest.htm>)

SUPPLEMENT

Table S1. Intertrait-correlations from 2018 to 2020 (*r*/*ρ*)

	2018							
	Narcissism	Machiavellianism	Psychopathy	Neuroticism	Extraversion	Openness	Agreeableness	Conscientiousness
2020								
Narcissism	.69*/.69*	.40*/.40*	.14/.18†	.22*/.25*	.24*/.17	.10/.10	-.10/-.10	-.20*/-.23*
Machiavellianism	.45*/.43*	.53*/.58*	.29*/.28*	.18/.22†	.15/.16	-.05/-.06	-.12/-.13	-.26*/-.26*
Psychopathy	.28*/.29*	.27*/.23*	.46*/.50*	.18/.15	-.25*/-.26*	-.20†/-.22†	-.22†/-.24*	-.19†/-.15
Neuroticism	.24*/.23*	.12/.16	-.07/-.06	.81*/.81*	-.22*/-.23*	-.28*/-.28*	-.19†/-.10	-.46*/-.47*
Extraversion	.21†/.18†	.11/.08	<.01/-.05	-.28*/-.28*	.84*/.83*	<.01/<.01	<.01/-.04	.31*/.28*
Openness	.05/.07	.09/.08	-.17/-.21†	-.30*/-.28*	.37*/.34*	.77*/.83*	.15/.10	.26*/.28*
Agreeableness	-.19†/-.19†	-.23*/-.21†	-.37*/-.35*	-.18†/-.14	.03/<.01	.16/.17	.59*/.60*	.05/.05
Conscientiousness	-.19†/-.20†	-.29*/-.32*	-.10/-.09	-.55*/-.60*	.33*/.39*	.29*/.36*	.21†/.16	.70*/.70*

Note: † *p* < .10, \* *p* < .05; *r* = Pearson's *r*/*ρ* = Spearman's *ρ*.

Table S2. Men: Intertrait-correlations and t-tests for traits from 2018 to 2020 (*β*/*ρ*)

	2018							
	Narcissism	Machiavellianism	Psychopathy	Neuroticism	Extraversion	Openness	Agreeableness	Conscientiousness
2020								
Narcissism	.67*/.67*	.42*/.42*	.33*/.35*	.24/.26†	.30*/.22	.18/.13	-.06/-.08	-.07/-.10
Machiavellianism	.56*/.56*	.58*/.63*	.30*/.27†	.35*/.36*	.03/.02	.04/-.01	-.19/-.18	-.33*/-.34*
Psychopathy	.38*/.35*	.33*/.24	.42*/.43*	.41*/.36*	-.35*/-.35	-.17/-.18	-.09/-.08	-.22/-.19
Neuroticism	.18/.18	.14/.15	.06/.02	.79*/.79*	-.32*/-.37*	-.37*/-.39*	-.29†/-.25†	-.56*/-.57*
Extraversion	.23/.21	.19/.18	.06/.02	-.34*/-.41*	.85*/.82*	.54*/.45*	-.02/-.09	.42*/.33*
Openness	.01/.02	-.04/-.03	-.27†/-.28†	-.36*/-.34*	.60*/.61*	.72*/.77*	.13/.11	.32*/.42*
Agreeableness	-.21/-.14	-.34*/-.28†	-.27†/-.26†	-.40*/-.36	.09/.09	.18/.27†	.59*/.59*	.06/.12
Conscientiousness	-.16/-.15	-.25†/-.31*	-.11/-.11	-.65*/-.67*	.37*/.44*	.32*/.41*	.25†/.19	.78*/.81*
M(SD) 2018	3.19(1.39)	2.94(1.32)	3.03(1.15)	3.78(1.13)	4.46(1.32)	4.84(1.25)	5.09(0.99)	5.59(1.01)
M(SD) 2020	3.45(1.76)	3.29(1.91)	3.21(1.70)	3.47(1.32)	4.43(1.40)	4.77(1.53)	5.19(0.98)	5.64(1.18)
t	1.32	1.70†	0.84	-2.52*	-0.26	-0.46	0.45	0.39
d	0.20	0.26	0.13	-0.37	-0.04	-0.07	0.07	0.06

Note: † *p* < .10, \* *p* < .05; *r* = Pearson's *r*/*ρ* = Spearman's *ρ*.

Table S3. Women: Intertrait-correlations and t-tests for traits from 2018 to 2020 ( $\beta/\rho$ )

	2018							
	Narcissism	Machiavellianism	Psychopathy	Neuroticism	Extraversion	Openness	Agreeableness	Conscientiousness
2020								
Narcissism	.70*/.69*	.47*/.51*	.07/.16	.14/.20	.18/.10	<.01/.06	-.15/-.10	-.38*/-.38*
Machiavellianism	.37*/.33†	.43*/.51	.22/.24	.05/.09	.32†/.32†	-.17/-.11	-.02/-.07	-.15/-.13
Psychopathy	.26/.37*	.09/.10	.40*/.46*	.11/.14	-.14/-.16	-.22/-.21	-.45*/-.48*	-.14/-.13
Neuroticism	.27/.26	.26/.27	-.03/.05	.82*/.82*	-.13/-.10	.20/.21	-.06/.09	-.39*/-.40*
Extraversion	.17/.11	.08/.07	-.02/-.05	-.20/-.23	-.85*/.84*	.08/.11	<.01/.03	.17/.22
Openness	.10/.12	-.14/-.15	.01/-.12	-.27/-.26	.01/-.02	.86*/.92*	.19/.13	.14/.10
Agreeableness	-.20/-.25	-.06/-.09	-.47*/-.43*	.04/.08	-.04/.17	.12/.03	.60*/.65*	.01/-.01
Conscientiousness	-.28/-.24	-.39*/-.39*	-.05/-.06	-.50*/-.49*	.28/.33	.26/.33†	.12/.06	.54*/.51*
M(SD) 2018	3.58(1.65)	2.35(1.37)	2.25(1.20)	4.37(1.13)	4.52(1.36)	4.92(1.23)	5.10(0.84)	5.70(0.89)
M(SD) 2020	4.06(2.21)	2.78(1.63)	2.24(1.54)	4.18(1.22)	4.72(1.73)	4.90(1.26)	5.34(1.00)	5.72(0.70)
t	2.10*	1.46	-0.07	-1.75†	1.22	-0.35	1.75†	0.36
d	0.36	0.25	-0.01	-0.30	0.21	-0.06	0.30	0.06

Note: †  $p < .10$ , \*  $p < .05$ ;  $r$  = Pearson's  $r$ ;  $\rho$  = Spearman's  $\rho$ .



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