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# Osobowościowe uwarunkowania problematycznego korzystania z portali społecznościowych – rola narcyzmu i związanych z nim motywów Ja

*Personality determinants of the problematic social networking sites use - the role of narcissism and associated self-motives*

Rozprawa doktorska napisana pod kierunkiem

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**Spis treści**

**Streszczenie**

Prezentowany projekt doktorski podejmuje zagadnienie podmiotowych uwarunkowań problematycznego korzystania z portali społecznościowych, ze szczególnym uwzględnieniem roli czynników osobowościowych. Zgodnie z obowiązującymi modelami specyficznych zaburzeń związanych z korzystaniem z Internetu, indywidualna podatność użytkownika oraz związane z nią czynniki motywacyjne i emocjonalne, wchodząc w interakcję z konkretną przestrzenią internetową, mogą przyczyniać się do rozwoju problematycznego korzystania z konkretnych aplikacji. Wcześniejsze badania wskazywały na istotną rolę narcyzmu w przewidywaniu problematycznego korzystania z portali społecznościowych. Niemniej, badania te nie uwzględniały złożoności tej cechy. Co więcej, zachowania samoregulacyjne osób o wysokim natężeniu narcyzmu mogą być wyjaśniane za pomocą dwóch motywów Ja tj. wzmacniania Ja (*self-enhancement*) i ochrony Ja (*self-protection*). Głównym celem prezentowanego projektu doktorskiego było zbadanie roli osobowościowych uwarunkowań problematycznego korzystania z portali społecznościowych, ze szczególnym uwzględnieniem narcyzmu i jego poszczególnych aspektów. Celem pobocznym prezentowanego projektu była weryfikacja trafności pomiaru wyjaśnianego konstruktu, a co za tym idzie walidacja narzędzi mierzących problematyczne korzystanie z portali społecznościowych, a także sprawdzenie relacji tego zaburzenia z poziomem funkcjonowania psychospołecznego i dobrostanem. Praca opiera się na siedmiu badaniach, przeprowadzonych na próbach liczących łącznie N = 5698 użytkowników portali społecznościowych, które zostały opisane w pięciu artykułach naukowych. Wyniki przeprowadzonych badań wskazują, że skale zastosowane do pomiaru problematycznego korzystania z portali społecznościowych mają dobre właściwości psychometryczne, konieczne do prowadzenia badań ilościowych. Problematyczne korzystanie wiązało się także pozytywnie z doświadczaniem stresu oraz negatywnie z subiektywnymi miarami dobrostanu, co potwierdza także dobrą trafność kryterialną wykorzystywanych

narzędzi. Co więcej, badania potwierdziły doniesienia z innych krajów, wskazujące przede wszystkim na związek problematycznego korzystania z portali społecznościowych z niskim poziomem stabilności emocjonalnej i sumienności. Dodatkowo, wykazano istotny związek tego zaburzenia z niską samooceną, niskim poczuciem samoskuteczności, samotnością oraz doświadczaniem lęku w sytuacjach społecznych. Co istotne, prezentowane badania wskazują, że zarówno aspekty narcyzmu związane z motywem wzmacniania Ja, jak i ochrony Ja są pozytywnie związane z problematycznym korzystaniem z portali społecznościowych. Prezentowany projekt doktorski integruje zatem perspektywę dwóch hipotez dotyczących mechanizmów (ścieżek) rozwoju problematycznego korzystania z portali społecznościowych, tj. hipotezy związanej z motywem wzmacniania siebie (ścieżka poszukiwania nagrody) i ochrony siebie (ścieżka lęku i kompensacji). Co więcej, wyniki przeprowadzonych badań wskazują, że w przypadku narcyzmu (w szczególności tych jego aspektów, które są związane z motywem ochrony Ja), mechanizm angażowania się w problematyczną aktywność bazuje na tendencjach do eskapizmu, potrzebie ulgi od przeżywania negatywnych emocji oraz kompensacji trudności doświadczanych w świecie poza Internetem. Prezentowane badania podkreślają tym samym perspektywę, która wiąże dane zjawisko z innymi problemami o charakterze nałogu. Dodatkowo, poprzez naświetlenie relacji pomiędzy poszczególnymi aspektami narcyzmu i związanymi z nim motywami Ja, a problematycznym korzystaniem z portali społecznościowych, niniejszy projekt przyczynia się do lepszego zrozumienia psychologicznego podłoża problematycznych zachowań w Internecie.

**Słowa kluczowe:** *problematyczne korzystanie z portali społecznościowych, osobowość, narcyzm, wzmacnianie Ja, ochrona Ja, uzależnienia behawioralne*

**Abstract**

This doctoral thesis addresses the individual determinants of problematic social networking sites use, focusing on the role of personality factors. According to the theoretical models of specific Internet-use disorders, a person-related vulnerability and related to it motivational and emotional factors interact with an online environment and may contribute to the development of the problematic use of specific applications. Previous studies have emphasized the role of narcissism as the essential personality-related risk factor of problematic social networking sites use. However, most research has focused on a broad conceptualization of narcissism, neglecting its complexity. Moreover, the self-regulatory behaviors of individuals with high levels of narcissism can be explained by two self-motives, i.e., self-enhancement and self-protection. Therefore, the main aim of this project was to investigate the role of personality-related determinants of the problematic social networking sites use, with a particular focus on narcissism and its specific aspects. Further, a side aim of the project was to verify the robustness of the measurement of the explained construct. Therefore, this project also validates the scales measuring problematic social networking sites use and investigates the associations between problematic social networking sites use with psychosocial functioning and well-being. The doctoral thesis is based on seven studies conducted on samples of N = 5698 social networking site users, published in five articles. The results indicate that the scales used to measure problematic social networking sites have good psychometric properties necessary to conduct quantitative research. Problematic social networking sites use was also positively associated with stress and negatively related to well-being, confirming the good criterion validity of those scales. Furthermore, the results primarily indicate the negative relationships between problematic social networking sites use, emotional stability, and conscientiousness, which is congruent with previous studies. Additionally, problematic social networking sites use was associated with low self-esteem, low self-efficacy, higher loneliness, and higher social anxiety.

Notably, the presented study results indicated that both self-enhancement-based and self-protection-based aspects of narcissism might contribute to the problematic social networking sites use. Therefore, this doctoral project integrated the two hypotheses on the development of problematic social networking use, i.e., the path associated with the self-enhancement motive (the reward-driven hypothesis) and the path associated with the self-protection motive (the fear-driven/compensation-seeking hypothesis). Moreover, in terms of narcissism (especially for those aspects of narcissism based on self-protection motive), the mechanism of engaging in problematic social networking sites use is primarily based on escapism, searching for relief from negative emotions, and compensation for difficulties experienced offline. Therefore, this project puts the addiction perspective into emphasis. Lastly, by highlighting the possible mechanisms which stand behind the relationships between particular aspects of narcissism and related to this trait self-motives that were linked to the problematic social networking sites use, this project contributes to a better understanding of the psychological background of problematic online behaviors.

**Keywords:** *problematic social networking sites use, personality, narcissism, self-enhancement, self-protection, behavioral addictions*

## Wprowadzenie

Niniejsza praca doktorska podejmuje zagadnienie podmiotowych uwarunkowań problematycznego korzystania z portali społecznościowych, ze szczególnym uwzględnieniem roli czynników osobowościowych. Na pracę doktorską składa się cykl 5 artykułów o charakterze empirycznym, które zostały opublikowane w recenzowanych czasopismach o zasięgu międzynarodowym. Cykl prac tworzą następujące teksty:

**ARTYKUŁ 1.** Atroszko, P. A., Balcerowska, J. M., Bereznowski, P., Biernatowska, A., Pallesen, S., Andreassen, C. S. (2018). Facebook addiction among Polish undergraduate students: Validity of measurement and relationship with personality and well-being. *Computers in Human Behavior*, *85*, 329–338.

Czasopismo wyróżnione na liście JCR, IF=8.957, 140 pkt. MNiSW;

Indywidualny wkład procentowy: 30%

**ARTYKUŁ 2.** Balcerowska, J. M., Biernatowska, A., Golińska, P., Barańska, J. (2019). Relationship between dimensions of grandiose narcissism and Facebook addiction among university students. *Current Issues in Personality Psychology, 7*(4), 313–323.

70 pkt. MNiSW;

Indywidualny wkład procentowy: 70%

**ARTYKUŁ 3.** Balcerowska, J. M., Bereznowski, P., Biernatowska, A., Atroszko, P. A., Pallesen, S., Andreassen, C. S. (2022). Is it meaningful to distinguish between Facebook addiction and social networking sites addiction? Psychometric analysis of Facebook addiction and social networking sites addiction scales. *Current Psychology*, *41*, 949–962.

Czasopismo wyróżnione na liście JCR, IF=2.387, 70 pkt. MNiSW;

Indywidualny wkład procentowy: 50%

**ARTYKUŁ 4.** Balcerowska, J. M., Sawicki, A. J. (2022). Which aspects of narcissism are related to Social Networking Sites addiction? The role of self-enhancement and self-protection. *Personality and Individual Differences, 190,* 111530.

Czasopismo wyróżnione na liście JCR, IF=3.950, 100 pkt. MNiSW;

Indywidualny wkład procentowy: 75%

**ARTYKUŁ 5.** Balcerowska, J. M., Sawicki, A. J., Brailovskaia, J., Zajenkowski, M. (2023). Different aspects of narcissism and Social Networking Sites addiction in Poland and Germany: The mediating role of positive and negative reinforcement expectancies. *Personality and Individual Differences, 207,* 112172.

Czasopismo wyróżnione na liście JCR, IF=3.950, 100 pkt. MNiSW;

Indywidualny wkład procentowy: 70%

Przedstawiony cykl publikacji opisuje wyniki siedmiu badań przeprowadzonych na próbach liczących łącznie N = 5698 użytkowników portali społecznościowych. Finasowanie tego projektu zostało częściowo zapewnione w ramach przyznanego mi przez Narodowe Centrum Nauki grantu Preludium 19 (numer projektu: 2020/37/N/HS6/00252). Powstanie cyklu publikacji jest także rezultatem moich wyjazdów i staży naukowych. Artykuł 1 oraz Artykuł 3 są wynikiem nawiązania współpracy w ramach odbytych w 2018 roku praktyk naukowych finansowanych z programu Erasmus+ na Uniwersytecie w Bergen, którego opiekunem merytorycznym był prof. Ståle Pallesen. Ostatnia praca ujęta w cyklu publikacji jest natomiast wynikiem współpracy w ramach stażu naukowego, realizowanego od listopada 2022 roku, pod opieką prof. Marcina Zajenkowskiego na Wydziale Psychologii Uniwersytetu Warszawskiego, który finansowany był z projektu Preludium 19, a także stypendium zagranicznego dzięki któremu wzięłam udział w International Postdoc Week, organizowanym przez Mental Health Research and Treatment Center na Uniwersytecie Rury w Bochum, które finansowane było w ramach programu Scouting for Global Excellence.

**Portale społecznościowe jako fenomen o zasięgu globalnym**

Dynamiczny rozwój technologii umożliwił nam przeniesienie naturalnej potrzeby jaką jest tworzenie relacji na płaszczyznę świata wirtualnego. Media społecznościowe stanowią grupę aplikacji, w których podstawową rolę odgrywają treści generowane przez samych użytkowników (tzw. Web 2.0). Do tego typu serwisów zaliczane są między innymi projekty oparte na współpracy (np. Wikipedia), blogi, strony oparte na tworzeniu treści (np. YouTube), wirtualne społeczności graczy (np. World of Warcraft), czy też portale społecznościowe (Kaplan, Haenlein, 2010). Te ostatnie definiowane są jako serwisy internetowe, które umożliwiają: (1) zaprojektowanie profilu własnej osoby w powiązanym systemie innych profili; (2) stworzenie listy innych użytkowników, z którymi nawiązywana jest łączność za pomocą serwisu; oraz (3) publikowanie dowolnego materiału na stworzonym przez siebie koncie i śledzenia aktywności innych użytkowników (Boyd, Ellison, 2007). Wraz ze wzrostem różnorodności oferowanych funkcji i aplikacji, portale społecznościowe stały się jedną z najpopularniejszych form komunikacji i autoprezentacji w Internecie (Ellison, Vitak, 2015). Przeciętny użytkownik Internetu spędza w sieci 6 godzin i 58 minut dziennie, z czego ponad 2 godziny i 27 minut poświęca na aktywność na portalach społecznościowych i komunikatorach (DataReportal, 2022). Wśród polskich internautów 27 mln stanowią użytkownicy portali społecznościowych (Statista, 2023a). Co więcej, większość użytkowników portali społecznościowych to adolescenci i młodzi dorośli (Statista, 2023b).

Teoria autodeterminacji wskazuje, że główną motywacją ludzkich zachowań jest chęć zaspokajania trzech podstawowych potrzeb: autonomii, kompetencji i relacji (Ryan, Deci, 2019). Korzystanie z portali społecznościowych stwarza przestrzeń do realizacji tych potrzeb, co stanowi silnie gratyfikujący aspekt tej aktywności (Karahanna i in., 2018). Dzięki urządzeniom mobilnym takim jak smartfony, portale społecznościowe są łatwo dostępne, a gratyfikacje te są nieustannie w zasięgu ręki. Niemniej, łatwość i natychmiastowość

uzyskiwania nagrody może prowadzić do zawężania się wachlarza dostępnych sposobów realizacji potrzeb, co w konsekwencji pociąga za sobą ryzyko utraty zainteresowania innymi formami kontaktów społecznych czy też zaniedbywania ważnych ról życiowych (Masur i in., 2014). W związku z tym, pomimo korzyści wynikających z istnienia portali społecznościowych, atrakcyjność ich struktury i formy użytkowania powoduje, że niektórzy użytkownicy angażują się w aktywność w sposób szkodliwy. Nadmierne korzystanie z portali społecznościowych związane jest między innymi z obniżoną wydajnością w pracy (Zivnuska i in., 2019), problemami w relacjach interpersonalnych (Tang i in., 2016), niską jakością snu (Alonzo i in., 2021), niższą satysfakcją z życia (Błachnio i in., 2016), a także współwystępowaniem symptomów zaburzeń, w tym depresji i zaburzeń lękowych (Andreassen i in., 2016; Brailovskaia i in., 2019). Część badaczy wskazuje także, że kompulsywne korzystanie z portali społecznościowych może być przyczyną występowania myśli i zachowań samobójczych wśród młodych użytkowników Internetu (Brailovskaia i in., 2020). W związku z powyższym, w literaturze przedmiotu pojawiły się doniesienia o problematycznym, czy też nałogowym korzystaniu z portali społecznościowych, oraz próby wyjaśnienia mechanizmów powstawania tego zaburzenia.

**Problematyczne korzystanie z portali społecznościowych**

Nałogowe korzystanie z portali społecznościowych odnosi się do nadmiernej koncentracji, związanej z silną motywacją do logowania się lub korzystania z portali społecznościowych, poświęcania czasu i zaangażowania w korzystanie z tych serwisów, co w konsekwencji wpływa na pogorszenie funkcjonowania w innych, ważnych sferach takich jak studia/praca, relacje interpersonalne oraz zdrowie i dobrostan psychiczny (Andreassen, Pallesen, 2014, s. 4054). Aktywność ta polega na nieustannym sprawdzaniu własnego profilu, zamieszczaniu postów, zdjęć i materiałów wideo, czytaniu na bieżąco wpisów znajomych i komentowaniu czy reagowaniu na zamieszczane przez nich treści, lub nieustannym odpisywaniu i śledzeniu

wiadomości za pomocą komunikatorów (Kuss, Griffiths, 2017). Kryteria, które są najczęściej stosowane w opisywaniu tego zaburzenia obejmują występowanie sześciu kluczowych symptomów tj. zaabsorbowanie, wzrost tolerancji, zmiana nastroju, symptomy odstawienia, konflikt, oraz nawroty po okresie abstynencji (Andreassen, 2015; Griffiths, 2005). Powyższe kryteria diagnostyczne stosowane są także w celu konstruowania narzędzi przesiewowych mierzących ryzyko problematycznego korzystania z portali społecznościowych w badaniach ilościowych (Cataldo i in., 2022)

Według części badaczy nadmierne korzystanie z portali społecznościowych charakteryzują objawy zbliżone do tych, które występują w przypadku uzależnień od substancji psychoaktywnych, czy też uzależnień behawioralnych (Andreassen, 2015; Brand i in., 2020; Kuss, Griffiths, 2017). Są też autorzy, którzy sprzeciwiają się konceptualizowaniu problematycznego korzystania z portali społecznościowych w kategorii uzależnienia (Carbonell, Panova, 2016), argumentując że uporczywe i kompulsywne korzystanie z tych serwisów może stanowić jedynie strategię na radzenie sobie ze stresem i innymi problemami (Kardefelt-Winther, 2017). Brak jest zatem spójności w obrębie przyjętej terminologii. Nazewnictwo, które najczęściej pojawia się w literaturze przedmiotu to uzależnienie od portali społecznościowych (ang. *Social Networking Sites addicition*; Kuss, Griffiths, 2017) i uzależnienie od mediów społecznościowych (ang. *social media addiciton*; Cheng i in., 2021), podkreślające że konstrukt wpisuje się w szerszą kategorię uzależnień behawioralnych. Uzależnienie od portali społecznościowych nie występuje jednak w żadnej z klasyfikacji chorób i zaburzeń tj. ICD-11 (Międzynarodowej Statystycznej Klasyfikacji Chorób i Problemów Zdrowotnych rewizja 11, ang. *International Statistical Classification of Diseases and Related Health Problems 11th revision*; WHO, 2019) oraz DSM-5 (Klasyfikacji Zaburzeń Psychicznych Amerykańskiego Towarzystwa Psychiatrycznego 5 edycja, ang. *Diagnostic and Statistical Manual of Mental Disorders 5th ed.*; APA, 2013), więc aby nie nadużywać

terminologii klinicznej, część badaczy stosuje szerszy i bardziej ogólny termin jakim jest problematyczne korzystanie z portali społecznościowych (ang. *problematic social networking sites use*; Hussain, Starcevic, 2020). Te same ramy zastosowano również do problematycznego korzystania z konkretnych platform (np. Facebooka; Marino i in., 2016). W literaturze przedmiotu znaleźć można również inne nazewnictwo, takie jak zaabsorbowanie Facebookiem (ang. *Facebook intrusion*; Elphinston, Noller, 2011), które definiowane jest jako nadmierne przywiązanie do tej platformy, zakłócające codzienne czynności i funkcjonowanie w relacjach interpersonalnych. W związku z tym, zgodnie z przyjętą i dominującą w literaturze anglojęzycznej terminologią w publikacjach zawartych w cyklu mojej rozprawy stosowałam termin uzależnienie od portali społecznościowych (ang. *Social Networking Sites addiction*). Jednocześnie w tytule rozprawy doktorskiej oraz w niniejszym autoreferacie przyjęłam termin **problematyczne korzystanie z portali społecznościowych**. Decyzja ta wynika z faktu, iż zjawisko to nie jest wciąż w pełni poznane i jego natura nie jest jednoznacznie określona (Brand i in., 2020; Hussain, Starcevic, 2020). Co więcej, badania przeze mnie prowadzone miały charakter badań ilościowych, prowadzonych na populacji ogólnej. W związku z tym, nie uprawniają one do stawiania wniosków klinicznych czy diagnostycznych. Niemniej, stosowane przeze mnie narzędzia do pomiaru problematycznego korzystania z portali społecznościowych oraz podłoże teoretyczne prezentowanych badań ujmują to zjawisko w kategorii zaburzenia, a ściślej ujmując uzależnienia behawioralnego. Dlatego też podsumowując wyniki moich badań odniosę się także do relacji tego problemu z uzależnieniem.

## Modele teoretyczne wyjaśniające specyficzne zaburzenia związane z korzystaniem z Internetu, w tym problematyczne korzystanie z portali społecznościowych

Modele wyjaśniające uzależnienia behawioralne, w szczególności modele opisujące specyficzne zaburzenia związane z korzystaniem z Internetu akcentują rolę czynników predysponujących w rozwoju nałogowych zachowań w sieci (np. Caplan, 2010; Davis, 2001).

W swoim projekcie doktorskim bazowałam przede wszystkim na integrującym poprzednie koncepcje modelu Interakcji Osoba-Afekt-Poznanie-Wykonanie (ang. *Interaction of Person-Affect-Cognition-Execution; I-PACE model*; Brand i in., 2016), dotyczącym specyficznych zaburzeń związanych z korzystaniem z Internetu. Model ten zakłada, że problematyczne korzystanie z aplikacji internetowych jest konsekwencją interakcji pomiędzy neurobiologicznymi i psychologicznymi czynnikami predysponującymi, oraz zmiennymi pośredniczącymi, takimi afektywne i poznawcze reakcje na bodźce wyzwalające, w połączeniu z obniżoną zdolnością do kontroli zachowania. Do czynników predysponujących możemy zaliczyć między innymi uwarunkowania osobowościowe, czynnikami pośredniczącymi w tym modelu są specyficzne strategie samoregulacji, a także zniekształcenia poznawcze dotyczące oczekiwania wzmocnień związanych z korzystaniem z konkretnej aplikacji. Użytkownik danej aplikacji może oczekiwać, że zachowanie dostarczy przyjemności i pozytywnych emocji (wzmocnienia pozytywne), lub też przyniesie ulgę w postaci ucieczki od doświadczanych problemów i negatywnych emocji (wzmocnienia negatywne). Czerpanie powyższych gratyfikacji może przyczyniać się natomiast do zwiększenia częstotliwości korzystania z danej aplikacji, natomiast deficyty w zakresie zdolności do hamowania reakcji, zmierzającej do ponownego korzystania z portalu społecznościowego, będą czynnikiem sprzyjającym rozwojowi nałogowej zależności. W najnowszej wersji modelu I-PACE (Brand i in., 2019) autorzy wskazują, że model ten może być ekstrapolowany nie tylko na zaburzenia związane z korzystaniem z Internetu, ale również na inne uzależnienia behawioralne.

Ciekawym ujęciem podmiotowych uwarunkowań problematycznego korzystania z portali społecznościowych, które zestawia powyższe założenia teoretyczne z wynikami dotychczasowych badań jest propozycja dwóch ścieżek rozwoju problematycznego korzystania z portali społecznościowych (Wegmann, Brand, 2019) Po pierwsze, wcześniejsze badania wskazywały na istotną rolę osobowościowych i psychospołecznych czynników związanych

z doświadczaniem lęku, wrażliwością interpersonalną czy też kompensacją deficytów związanych z obniżonym funkcjonowaniem społecznym (Eraslan-Capan, 2017; Hong i in., 2019; Wegmann, Brand, 2016). Po drugie, badania sugerują, że osoby problematycznie korzystające z portali społecznościowych poszukują nagród i wzmocnień związanych z potrzebą uznania, popularności i pozytywnego obrazu siebie (Casale, Fioravanti, 2018; Lyvers i in., 2020). Korzystanie z portali społecznościowych dostarcza natychmiastowych wzmocnień w postaci dawania i odbierania pozytywnych informacji zwrotnych, stymulując przy tym układ nagrody (Sherman i in., 2016; Sherman i in., 2018), co może okazać się silnie gratyfikujące szczególnie dla osób, dążących do wzmacniania Ja. W związku z tym, proces związany w mechanizmem powstawania zależności od portali społecznościowych może opierać się na dwóch ścieżkach – ścieżce lęku i kompensacji (ang. *fear-driven/compensation-seeking hypothesis*) oraz ścieżce poszukiwania nagród (ang. *reward-driven hypothesis*). Ścieżki te, choć niezależne, mogą się wzajemnie wzmacniać lub zmieniać swój stosunkowy udział w czasie - początkowe dążenie do gratyfikacji, z czasem słabnie na rzecz kompensacji związanej z doświadczaniem problemów w związku z problematycznym zachowaniem w sieci. Podobne wielotorowe ujęcie mechanizmów rozwoju i utrzymywania się zachowań nałogowych możemy również odnaleźć w modelach wyjaśniających uzależnienia od substancji psychoaktywnych (Heinz i in., 2003; Verheul i in., 1999).

**Cel projektu i uzasadnienie podjętej tematyki badań**

Modele teoretyczne wyjaśniające specyficzne zaburzenia związane z korzystaniem z Internetu podkreślają rolę określonych predyspozycji podmiotowych. W takim ujęciu, problematyczne korzystanie z portali społecznościowych może być rozumiane jako rezultat nieskutecznej regulacji emocjonalnej czy dysfunkcjonalnej strategii radzenia sobie wśród osób o określonych uwarunkowaniach osobowościowych. Wcześniejsze badania wskazywały

między innymi na negatywny związek problematycznego korzystania z portali społecznościowych ze stabilnością emocjonalną, sumiennością (Huang, 2022a; Marino i in., 2018a) i samooceną (Huang, 2022b; Marino i in., 2018a). Istotne okazały się być także zmienne związane z funkcjonowaniem psychospołecznym, takie jak nieśmiałość i doświadczanie lęku społecznego (Hong i in., 2019). W literaturze przedmiotu brakuje jednakże badań, które uwzględniałyby specyfikę samej aktywności i zbieżnych z nią motywów Ja, stanowiących grunt dla potencjalnych mechanizmów rozwoju i wzmacniania problematycznych zachowań. Tworzenie relacji z innymi, autoprezentacja oraz poszukiwanie społecznych wzmocnień stanowią podstawowe motywy korzystania z portali społecznościowych (Al-Menayes, 2015; Nadkarni, Hofmann, 2012). Cechą osobowości, która koresponduje z powyższymi motywami oraz związana jest z nasilonym angażowaniem się w samoregulacyjne strategie dążące do utrzymania wielkościowego obrazu siebie jest narcyzm (Morf, Rhodewalt, 2001). W istocie, wcześniejsze badania wskazywały na znaczącą rolę narcyzmu w rozwoju problematycznego korzystania z tych serwisów (Andreassen i in., 2017; Błachnio, Przepiórka, 2018). Niemniej, badania te nie uwzględniały złożoności tej cechy (Casale, Banchi, 2020). Narcyzm jest z jednej strony cechą wielowymiarową, z drugiej silnie związaną z motywami i strategiami służącymi wzmacnianiu, czy też ochronie pozytywnego obrazu własnej osoby (Sedikides, 2021). W związku z powyższym, celem prezentowanego projektu doktorskiego było zbadanie roli osobowościowych uwarunkowań problematycznego korzystania z portali społecznościowych, ze szczególnym uwzględnieniem roli narcyzmu i jego poszczególnych aspektów. W szerszym kontekście, celem prowadzonych przeze mnie badań była również próba integracji dwóch hipotez dotyczących mechanizmów rozwoju problematycznego korzystania z portali społecznościowych i poszukiwania specyficznych ścieżek związanych z motywem wzmacniania siebie (ścieżka poszukiwania nagrody) i ochrony siebie (ścieżka lęku i kompensacji). W związku z tym, że wyjaśniane zjawisko jest fenomenem stosunkowo nowym,

celem pobocznymi prezentowanego projektu była weryfikacja trafności pomiaru wyjaśnianego konstruktu, a co za tym idzie walidacja narzędzi do pomiaru problematycznego korzystania oraz relacji problematycznego korzystania z portali społecznościowych z poziomem funkcjonowania psychospołecznego i dobrostanem (trafność kryterialna).

**Przegląd zrealizowanych badań własnych**

Zamieszczony poniżej przegląd badań własnych prezentuje najważniejsze uzyskane wyniki w podziale na poszczególne obszary dociekań, uwzględniając wspomniane cele projektu doktorskiego oraz drogę do ich realizacji.

### 1.1. Czynniki osobowościowe, w tym rola narcyzmu i jego poszczególnych aspektów w przewidywaniu problematycznego korzystania z portali społecznościowych.

Celem głównym prezentowanego projektu doktorskiego było zbadanie roli poszczególnych cech osobowości, jako podmiotowych uwarunkowań problematycznego korzystania z portali społecznościowych. Badanie opublikowane w czasopiśmie *Computers in Human Behavior* (zob. ARTYKUŁ 1), otwiera cykl publikacji i jest próbą stworzenia wstępnego, zintegrowanego modelu osobowościowych i psychospołecznych uwarunkowań problematycznego korzystania z Facebooka. Tworząc swoistą bazę dla przyszłych dociekań, zaprezentowaliśmy w artykule przegląd dotychczasowych badań nad osobowościowymi i psychospołecznymi korelatami problematycznego korzystania z Facebooka oraz integrując te wyniki, sprawdzaliśmy relatywny wkład poszczególnych zmiennych w wyjaśnianie tego zjawiska. Postawiliśmy szereg hipotez dotyczących osobowościowych korelatów tego zaburzenia. Założyliśmy, że problematyczne korzystanie z Facebooka będzie wiązało się z niskim poziomem stabilności emocjonalnej, sumienności i otwartości na doświadczenie, niską samooceną, i niskim poziomem samoskuteczności, a także wysokim poziomem ekstrawersji. Dodatkowo, wcześniejsze badania wskazywały na ważną rolę narcyzmu jako cechy, która jest

specyficznie związana z aktywnością nastawioną na poszukiwanie wzmocnień w postaci pozytywnych reakcji i komentarzy innych użytkowników (Andreassen i in., 2017). W badaniu przeprowadzonym na dużej próbie młodych dorosłych ($N$ = 1157) wykazaliśmy, że cechy osobowości w Modelu Wielkiej Piątki, w szczególności wysokie nasilenie ekstrawersji, neurotyzmu oraz niskie nasilenie sumienności i otwartości na doświadczenie przewidują problematyczne korzystanie z Facebooka ponad zmienne demograficzne. W dalszej części analiz wykazaliśmy, że zmienne takie jak narcyzm, niskie poczucie samoskuteczności, samotność oraz doświadczanie lęku społecznego przewidują ryzyko problematycznego korzystania z Facebooka ponad zmienne demograficzne oraz cechy Wielkiej Piątki. Co istotne, narcyzm okazał się być niezależnym oraz jednym z najsilniejszych predyktorów osobowościowych w tym badaniu. Prezentowana publikacja była pierwszym w literaturze przedmiotu, tak szerokim empirycznym ujęciem osobowościowych i psychospołecznych czynników ryzyka problematycznego korzystania z Facebooka, wskazującym na względną rolę poszczególnych predyktorów tego zjawiska i została dostrzeżona w społeczności badaczy (194 cytowania, źródło: Google Scholar, 25.04.2023r).

Wyniki badania opublikowanego w czasopiśmie *Computers in Human Behavior* (zob. ARTYKUŁ 1), wskazywały że narcyzm jest jednym z kluczowych osobowościowych predyktorów problematycznego korzystania z Facebooka. Portale społecznościowe stanowią przestrzeń, w której możliwe jest wzmacnianie Ja, co stanowi szczególną wartość dla osób skupionych na zachowaniu pozytywnego obrazu własnej osoby (Campbell, McCain, 2018). Komunikacja internetowa zapewnia kontrolę udostępnianych informacji, dostęp do szerokiego grona odbiorców, uzyskiwanie natychmiastowej informacji zwrotnej, a także możliwość kreowania innego, niż w rzeczywistości pozainternetowej, wizerunku (Fioravanti i in., 2020). W związku z tym celem badania, opublikowanego w czasopiśmie *Current Issues in Personality Psychology* (zob. ARTYKUŁ 2), było sprawdzenie czy narcyzm wielkościowy (ang. *grandiose*

*narcissism*) wyjaśnia problematyczne korzystanie z Facebooka ponad zmienne demograficzne i cechy Wielkiej Piątki. Celem badania było także sprawdzenie, które aspekty narcyzmu wielkościowego będą niezależnie związane z tym zaburzeniem. Przejęliśmy model, w którym cztery aspekty narcyzmu wielkościowego (przywództwo, domaganie się podziwu, samowystarczalność i próżność) usytuowane są na dwóch przeciwstawnych wymiarach: aktywność vs. bierność oraz zależność od obecności innych vs. niezależność od obecności innych. Każdy z powyższych aspektów wiąże się z innymi strategiami na wzmacnianie ja i utrzymywanie wysokiej samooceny (Bazińska, Drat-Ruszczak, 2000). Wyniki badania przeprowadzonego na próbie młodych użytkowników Facebooka ($N$ = 486) wykazały, że włączenie narcyzmu do modelu istotnie zwiększa procent wyjaśnianej wariancji oraz że związek między cechami Wielkiej Piątki, a problematycznym korzystaniem z Facebooka przestaje być istotny. Powyższe badanie potwierdziło więc założenie, że portale społecznościowe stanowią przestrzeń, w której możliwa jest realizacja motywów związanych z Ja (Campbell, McCain, 2018). Może to stanowić szczególną gratyfikację dla osób dążących do wzmacniania siebie (ang. *self-enhancement*) i przyczyniać się do rozwoju problematycznego korzystania z portali społecznościowych. Co więcej, uwzględnienie złożoności samego narcyzmu pozwoliło nam wykazać, że to domaganie się podziwu (aspekt narcyzmu bierny i zależny od obecności innych, zawierający element roszczeniowości) przywiduje ryzyko problematycznego korzystania z Facebooka, natomiast samowystarczalność (narcyzm aktywny i niezależny od obecności innych, związany z przekonaniem o własnej niezależności, indywidualizmie i wysokich kompetencjach), jest negatywnie związana z problematycznym korzystaniem.

Obserwowany przez nas wzrost różnorodności dostępnych w przestrzeni internetowej portali społecznościowych, a także teoretyczna i metodologiczna dyskusja, dotyczącą sposobu konceptualizacji i pomiaru samego konstruktu (Kuss, Griffiths, 2017), zrodziły pytanie czy

wyniki dotyczące osobowościowych predyktorów problematycznego korzystania z konkretnej platformy (tj. od Facebooka), mogą być ekstrapolowane na bardziej ogólny konstrukt, jakim jest problematyczne korzystanie z portali społecznościowych. Celem badania opublikowanego w czasopiśmie *Current Psychology* (zob. ARTYKUŁ 3) było porównanie siły związków problematycznego korzystania z Facebooka oraz problematycznego korzystania z portali społecznościowych z cechami Wielkiej Piątki, w grupie użytkowników, posiadających konto na więcej, niż jednym portalu społecznościowym ($N$ = 953). Wykazaliśmy, że zarówno problematyczne korzystanie z Facebooka, jak i ogólnie z portali społecznościowych wiąże się negatywnie ze stabilnością emocjonalną oraz sumiennością, a siła tych związków jest taka sama w przypadku obu konstruktów. Badanie dostarczyło zatem przesłanki o możliwości wnioskowania na temat zbieżności dotyczącej podstawowych osobowościowych korelatów problematycznego korzystania z portali społecznościowych, oraz jego podtypu jakim jest problematyczne korzystanie z Facebooka. Powyższe wyniki skłoniły nas także do następujących konkluzji. Po pierwsze, większość użytkowników portali społecznościowych posiada konto na więcej, niż jednym portalu społecznościowym, a same serwisy, pomimo istniejących różnic, oferują swoim użytkownikom podobne funkcjonalności tj. tworzenie sieci kontaktów, publikacja materiałów, czy komunikacja z innymi. Po drugie, wyniki prezentowanego badania wskazują na występowanie zbieżności w obrębie podmiotowych czynników ryzyka problematycznego korzystania z poszczególnych serwisów

Powyższe rozważania doprowadziły do powstania kolejnej pracy, opublikowanej w czasopiśmie *Personality and Individual Differences* (zob. ARTYKUŁ 4). W trzech niezależnych badaniach, prowadzonych na dużych grupach użytkowników portali społecznościowych ($N$ = 1659, w tym jedna próba studencka oraz dwie próby ogólnopolskie), skoncentrowaliśmy się na związku problematycznego korzystania z portali społecznościowych z czterema aspektami narcyzmu (Sedikides, 2021) tj. narcystycznym podziwem (ang.

*admirative narcissism*), narcyzmem wspólnotowym (ang. *communal narcissism*), narcyzmem rywalizacyjnym (ang. *rivalrous narcissism*) oraz narcyzmem wrażliwym (ang. *vulnerable narcissism*). Zgodnie ze współczesnymi modelami tej cechy wszystkie aspekty narcyzmu łączy egocentryzm, poczucie wyższości i wyjątkowości (Miller i in., 2021; Sedikides, 2021). Niemniej, poszczególne aspekty różnią się w obrębie dominujących motywów związanych z Ja. Dla narcystycznego podziwu oraz narcyzmu wspólnotowego charakterystyczny jest motyw wzmacniania Ja (ang. *self-enhancement*), dla narcyzmu rywalizacyjnego oraz narcyzmu wrażliwego charakterystyczny jest motyw ochrony Ja (ang. *self-protection*). Co więcej, motyw związany z wzmacnianiem siebie może być realizowany zarówno w domenie sprawczej, jak i w domenie wspólnotowej (odpowiednio narcystyczny podziw i narcyzm wspólnotowy). Motyw związany z ochroną ja może być natomiast realizowany zarówno poprzez unikanie potencjalnych zagrożeń dla Ja (w przypadku narcyzmu wrażliwego), oraz poprzez antagonizm i dążenie do dominacji (w przypadku narcyzmu rywalizacyjnego). W omawianym artykule przyjęliśmy założenie, że portale społecznościowe mogą stanowić dogodną przestrzeń do realizacji narcystycznych motywów związanych z Ja, co w konsekwencji stanowi mechanizm nagradzający, który zwiększa ryzyko zależności od platformy. Dodatkowo, wcześniejsze wyjaśnienia dotyczące związku narcyzmu z problematycznym korzystaniem z portali społecznościowych opierały się przede wszystkim na łączeniu narcyzmu z potrzebą poszukiwania podziwu i społecznych dowodów uznania (motyw wzmacniania Ja, który może być związany ze ścieżka poszukiwania nagród). Niemniej zarówno motyw wzmacniania Ja, jak i ochrony Ja mogą prowadzić do problematycznego korzystania w sposób niezależny i addytywny. W związku z tym, celem analiz było sprawdzenie które z aspektów narcyzmu, wiążące się zarówno z ochroną Ja jak i wzmacnianiem Ja, są niezależnymi predyktorami problematycznego korzystania z portali społecznościowych, ponad inne istotne dla obydwu konstruktów zmienne tj. wiek, płeć oraz samoocenę. W trzech niezależnych badaniach

wykazaliśmy, że wszystkie cztery aspekty narcyzmu są pozytywnie związane z tym zjawiskiem. Co więcej, narcyzm wspólnotowy, narcyzm rywalizacyjny oraz narcyzm wrażliwy okazały się być niezależnymi predyktorami problematycznego korzystania z portali społecznościowych (ponad zmienne demograficzne, samoocenę oraz pozostałe aspekty narcyzmu). Podsumowując, po raz kolejny narcyzm okazał się być istotnym osobowościowym predyktorem problematycznego korzystania z portali społecznościowych. Efekt narcyzmu w każdym z trzech badań był niezależny od efektu samooceny, co wskazuje, że mimo wzajemnych powiązań, mają one indywidualny wkład w wyjaśnianie tego zaburzenia. Co istotne, związek pomiędzy narcyzmem a problematycznym korzystaniem może być wyjaśniany przez dwa podstawowe motywy związane z Ja: wzmacnianie Ja oraz ochronę Ja. Dodatkowo, czerpanie gratyfikacji w postaci wzmacniania siebie w domenie wspólnotowej, może być niezależnym czynnikiem sprzyjającym problematycznemu korzystaniu z portali społecznościowych, co wynika z silnie społecznej natury tych serwisów. Warto jednak podkreślić, że powyższe badanie było pierwszym, uwzględniającym narcyzm wspólnotowy jako predyktor problematycznego korzystania, w związku z tym wyniki dotyczące związku narcyzmu wspólnotowego z problematycznym korzystaniem z portali społecznościowych należy traktować z ostrożnością.

Wyniki opublikowane w Artykule 4 wskazują, że poszczególne aspekty narcyzmu mogą być niezależnie związane z problematycznym korzystaniem z portali społecznościowych. Niemniej, mechanizm leżący u podłoża tej relacji nie jest znany. W związku z tym, w kolejnym artykule opublikowanym w czasopiśmie *Personality and Individual Differences* (zob. ARTYKUŁ 5) chcieliśmy sprawdzić czy związek między poszczególnymi aspektami narcyzmu, a problematycznym korzystaniem z portali społecznościowych może być wyjaśniany przez oczekiwania wzmocnień w trakcie korzystania z portali społecznościowych. Zgodnie z wcześniej omawianym modelem I-PACE, osobowościowa podatność (w tym

narcyzm) oraz kontakt z konkretną aplikacją internetową, prowadzi do wykształcenia specyficznych oczekiwań dotyczących gratyfikującego charakteru aktywności jaką jest korzystanie z portali społecznościowych. Oczekiwania gratyfikacji mogą przybierać dwie formy: oczekiwanie, że aktywność dostarczy przyjemności i pozytywnych emocji (wzmocnienie pozytywne), oraz oczekiwanie, że aktywność pozwoli na unikanie przykrości, problemów oraz na radzenie sobie z negatywnymi emocjami (wzmocnienie negatywne). Rozszerzając zatem wcześniej testowany model chcieliśmy sprawdzić czy aspekty narcyzmu bazujące na motywie wzmacniania Ja będą związane z problematycznym korzystaniem z portali społecznościowych poprzez oczekiwanie wzmocnień pozytywnych, natomiast aspekty narcyzmu bazujące na motywie ochrony Ja będą związane z problematycznym korzystaniem poprzez oczekiwanie wzmocnień negatywnych. Nasze założenia testowaliśmy na dwóch niezależnych próbach z Polski oraz Niemiec (łącznie $N$ = 1946 użytkowników portali społecznościowych). Wyniki badania pozwoliły nam ponownie wykazać, że zarówno aspekty narcyzmu związane z motywem wzmacniania Ja, jak i ochrony Ja są pozytywnie związane z problematycznym korzystaniem z portali społecznościowych. Niemniej, uwzględniając siłę wykrytych związków, to aspekty narcyzmu związane z ochroną Ja (narcyzm rywalizacyjny i narcyzm wrażliwy) były silniej związane z tym zaburzeniem w obydwu krajach. Co więcej, zarówno narcyzm rywalizacyjny jak i narcyzm wrażliwy, były konsekwentnie silniej związane z oczekiwaniem wzmocnień negatywnych zarówno w Polsce, jak i w Niemczech. Analizy mediacji wykazały, że za pozytywny związek pomiędzy trzema aspektami narcyzmu (narcystycznym podziwem, narcyzmem rywalizacyjnym oraz narcyzmem wrażliwym), a problematycznym korzystaniem z portali społecznościowych odpowiada przede wszystkim oczekiwanie ulgi w doświadczaniu nieprzyjemnych stanów wewnętrznych oraz potrzeba ucieczki od problemów przeżywanych w rzeczywistości offline (oczekiwanie wzmocnień negatywnych). Co ciekawe, oczekiwania wzmocnień pozytywnych nie pełniły tak istotnej roli,

co poskutkowało brakiem (w przypadku Niemiec) lub znacznie słabszą (w przypadku Polski) mediacją związku pomiędzy poszczególnymi aspektami narcyzmu, a problematycznym korzystaniem z portali społecznościowych.

## 1.2. Walidacja narzędzi do pomiaru problematycznego korzystania z portali społecznościowych

Celem pobocznym projektu doktorskiego była walidacja polskich wersji narzędzi do pomiaru problematycznego korzystania z portali społecznościowych. Pierwsze badania dotyczące tego zjawiska koncentrowały się wokół Facebooka, jako najbardziej prototypowego przykładu portalu społecznościowego (Marino i in., 2018a; Ryan i in., 2014) Jednakże wzrost liczby i różnorodności portali społecznościowych sprawił, że przeciętny użytkownik Internetu posiadał konto na kilku różnych platformach (GlobalWebIndex, 2017). W kontekście badań nad problematycznym korzystaniem z portali społecznościowych, dynamiczny rozwój tych serwisów zrodził dyskusję zarówno z perspektywy koncepcyjnej, jak i metodologicznej (Kuss, Griffiths, 2017) Część badaczy postuluje, że problematyczne korzystanie z portali społecznościowych należy konceptualizować i badać jako zjawisko ogólne, oderwane od konkretnej platformy (Griffiths i in., 2014; Kuss, Griffiths, 2017). Natomiast część zwraca uwagę, że korzystanie z danego medium jest ukierunkowane na cel i może być związane z czerpaniem różnych form gratyfikacji, a więc dla zrozumienia mechanizmu rozwoju problematycznej zależności kluczowe jest uwzględnienie wyników badań dotyczących konkretnych platform (Ryan i in., 2014). W ramach badania opublikowanego w Artykule 1 dokonaliśmy walidacji polskiej wersji skali do pomiaru uzależnienia od Facebooka (ang. *Bergen Facebook Addiction Scale*; Andreassen i in., 2012) na dużej próbie młodych użytkowników Internetu. Natomiast celem analiz w Artykule 3 było porównanie właściwości psychometrycznych skali do pomiaru uzależnienia od portali społecznościowych (ang. *Bergen*

*Social Media Addiciton Scale*; Andreassen i in., 2016) ze skalą do pomiaru uzależnienia od Facebooka. Celem szczegółowym analiz w Artykule 3 było porównanie siły związku między problematycznym korzystaniem z Facebooka oraz problematycznym korzystaniem z portali społecznościowych wśród użytkowników, którzy posiadają konto wyłącznie na Facebooku, oraz użytkowników aktywnie korzystających z kilku różnych platform. Zarówno skala do pomiaru uzależnienia od Facebooka (BFAS) jak i uzależnienia od portali społecznościowych (BSMAS) zawierają sześć pozycji, mierzących częstotliwość występowania sześciu kluczowych symptomów uzależnienia występujących w ciągu ostatnich 12 miesięcy (Griffiths, 2005). Im wyższy wynik w skali, tym większe ryzyko problematycznego korzystania. Poprzednie badania wskazywały na jednoczynnikową strukturę obydwu skal oraz ich dobrą trafność i rzetelność (Monacis i in., 2017; Phanasathit i in., 2015). Wyniki analizy czynnikowej przeprowadzonej w pierwszym badaniu (zob. ARTYKUŁ 1) wykazały, że skala BFAS ma jednoczynnikową strukturę ze skorelowanymi błędami pozycji 1 i 2. Natomiast, wyniki analizy czynnikowej w kolejnym badaniu (zob. ARTYKUŁ 3) wykazały, że obydwie skale mają jednoczynnikową strukturę ze skorelowanymi błędami pozycji 1 i 2 oraz 3 i 4. Wyniki te są zbieżne z wynikami innych badań (Monacis i in., 2017), a korelacje błędów zostały wprowadzone również w przypadku innych skal opartych na podstawowych komponentach uzależnienia (Atroszko i in., 2017). Może to wynikać z faktu, że skale do pomiaru uzależnienia oprócz kompulsji mierzą również komponent wysokiego nakładu czasu i energii wkładanej w dane zachowanie (kryterium związane z zaangażowaniem w daną aktywność). W kontekście porównań międzygrupowych, problematyczne korzystanie z Facebooka było związane z problematycznym korzystaniem z portali społecznościowych, a związek ten był istotnie silniejszy w grupie osób korzystających tylko z Facebooka, co wskazuje na dobrą trafność zbieżną i różnicową skal. Warto także w tym miejscu dodać, że w związku z koniecznością przeprowadzenia porównań międzykulturowych w Artykule 5, przeprowadziliśmy analizę

czynnikową oraz analizę równoważności pomiaru skalą BSMAS w próbach polskiej i niemieckiej (zob. Suplement do ARTYKUŁ 5). Wyniki po raz kolejny potwierdziły jednoczynnikową strukturę narzędzia. Co więcej, pomiar skalą BSMAS w Polsce i w Niemczech był równoważmy na poziomie metrycznym, co umożliwiło porównywania siły korelacji problematycznego korzystania z portali społecznościowych z innymi zmiennymi w obydwu krajach. W związku z brakiem równoważności skalarnej niemożliwe jest natomiast porównywanie poziomu problematycznego korzystania z portali społecznościowych w tych dwóch kontekstach kulturowych. Podsumowując, powszechnie stosowane w badaniach nad problematycznym korzystaniem z portali społecznościowych skale BFAS i BSMAS mają dobre właściwości psychometryczne konieczne do prowadzenia badań ilościowych. Co więcej, korzystanie ze skal mierzących problematyczne korzystanie z konkretnej platformy (np. Facebooka) jest zasadne gdy badacze są zainteresowani specyfiką danej grupy użytkowników lub specyfiką mechanizmów gratyfikujących w kontekście korzystania z konkretnej platformy. Niemniej, znaczna większość użytkowników Internetu, korzysta z różnych portali społecznościowych jednocześnie. W związku z tym bardziej odpowiednie wydaje się uwzględnianie takich czynników jak motywy korzystania z portali społecznościowych czy preferencja konkretnej praformy przy jednoczesnym badanu problematycznego korzystania z portali społecznościowych jako bardziej ogólnego fenomenu (Kuss, Griffiths, 2017).

### 1.3. Problematyczne korzystanie z portali społecznościowych a dobrostan

Drugim celem pobocznym projektu było sprawdzenie związku pomiędzy problematycznym korzystaniem z portali społecznościowych, a dobrostanem. Wcześniejsze badania wskazywały między innymi na negatywne związki problematycznego korzystania z portali społecznościowych z satysfakcją z życia, jakością snu, zadowoleniem z własnego zdrowia, a także wysokim poziomem stresu (Alonzo i in., 2021; Błachnio i in., 2016; Hou i in., 2017; Marino i in., 2018b). Co więcej, definicja samego konstruktu zakłada, że aby mówić o

problematycznym korzystaniu, powinno ono powodować szkody czyli negatywne konsekwencje dla osoby i jej bliskich (Andreassen, Pallesen, 2014), co wiąże się z kryterium odwołującym się do istotności klinicznej danego zaburzenia. W związku z tym, podobnie jak w przypadku sprawdzania założeń związanych z trafnością i rzetelnością pomiaru samego konstruktu, weryfikacja związków problematycznego korzystania z portali społecznościowych z różnymi miarami dobrostanu i jakości życia jest związana ze sprawdzeniem podstawowych założeń dotyczących trafności kryterialnej tego zjawiska. Celem badań opublikowanych w Artykule 1 było sprawdzenie czy problematyczne korzystanie z Facebooka wyjaśnia podwyższony poziom stresu, pogorszenie stanu zdrowia i jakości życia ponad zmienne demograficzne, osobowość i funkcjonowanie psychospołeczne. Natomiast celem Artykułu 3 było sprawdzenie czy problematyczne korzystanie z portali społecznościowych jako bardziej ogólne zjawisko wyjaśnia podwyższony poziom stresu i obniżony poziom dobrostanu ponad zmienne demograficzne, osobowość oraz problematyczne korzystanie z pojedynczej platformy (tj. Facebooka) w grupie użytkowników, którzy posiadają konto na kilku różnych portalach społecznościowych. Wyniki naszych analiz w obydwu publikacjach wskazują, że uwzględniając wiek, płeć, cechy osobowości oraz funkcjonowanie psychospołeczne, to zarówno problematyczne korzystanie z Facebooka, jak i problematyczne korzystanie z portali społecznościowych wiążą się pozytywnie z doświadczaniem stresu oraz negatywnie z subiektywnymi miarami dobrostanu. Wyniki te są zgodne z wcześniejszymi badaniami i wskazują na unikalny wkład tych zaburzeń w pogorszenie funkcjonowania osób problematycznie korzystających z tych aplikacji. Co więcej, w związku z tym, że problematyczne korzystanie z portali społecznościowych jest konstruktem bardziej ogólnym i może zawierać w sobie problemy związane z korzystaniem z kilku różnych platform, to wiązało się ze stresem i obniżonym dobrostanem ponad problematyczne korzystanie z jednej platformy tj. Facebooka.

**Najważniejsze wnioski wynikające ze zrealizowanego projektu**

Zrealizowany projekt doktorski dostarczył nowych i istotnych informacji na temat osobowościowych uwarunkowań problematycznego korzystania z portali społecznościowych, przede wszystkim pogłębiając znacząco rozumienie wcześniej zaobserwowanej zależności pomiędzy narcyzmem, a problematycznym korzystaniem z portali społecznościowych. W niniejszej rozprawie podjęłam próbę zintegrowania wyników poprzednich badań oraz starałam się pogłębić wiedzę o naturze badanego zjawiska, poprzez uwzględnienie z jednej strony założeń teoretycznych dotyczących rozwoju zaburzeń związanych z korzystaniem z Internetu, z drugiej natomiast specyficznych osobowościowych motywów i wynikających z nich mechanizmów gratyfikacji, które mogą być łączone z aktywnością jaką jest korzystanie z portali społecznościowych.

Moje dociekania empiryczne w prezentowanym cyklu publikacji rozpoczęłam ujmując problem osobowościowych i psychospołecznych czynników ryzyka problematycznego korzystania z portali społecznościowych możliwie szeroko. Prowadzone przez nas badania potwierdziły doniesienia z innych krajów (Huang, 2022a; Marino i in., 2018a), replikując wyniki wskazujące przede wszystkim na związek problematycznego korzystania z portali społecznościowych oraz jego podtypu jakim jest problematyczne korzystanie z Facebooka z obniżonym poziomem stabilności emocjonalnej i sumienności. Dodatkowo wykazaliśmy istotny związek problematycznego korzystania z portali społecznościowych z niską samooceną, niską samoskutecznością, samotnością oraz doświadczaniem lęku w sytuacjach społecznych, co także jest zgodne z wcześniejszymi badaniami (Błachnio i in., 2016; Hong i in., 2019; Wegmann, Brand, 2016). Sformułowaliśmy także wstępne wnioski dotyczące podmiotowych uwarunkowań tego zaburzenia. **Problematyczne korzystanie z portali społecznościowych może być rozumiane jako wynik nieadaptacyjnej samoregulacji wśród osób, które z jednej strony dążą do nawiązywania relacji, poszukując w szczególności aprobaty i**

**podziwu ze strony innych, a jednocześnie doświadczają samotności poza Internetem ze względu na obniżone poczucie własnej skuteczności, oraz doświadczanie lęku w interakcjach społecznych. Co istotne, powyższe wnioski, okazały się być zgodne z późniejszym, dwutorowym ujęciem ścieżek rozwoju tego zaburzenia** (Wegmann, Brand, 2019)**.**

Badania nad trafnością skal BFAS i BSMAS, a także zbieżność korelatów problematycznego korzystania z portali społecznościowych oraz z Facebooka z podstawowymi cechami osobowości w Modelu Wielkiej Piątki, skłoniły nas także do następujących konkluzji. Po pierwsze, większość użytkowników portali społecznościowych posiada konto na więcej, niż jednym portalu społecznościowym, a same serwisy, pomimo istniejących różnic, oferują podobne funkcjonalności. Po drugie, wyniki naszych badań wskazują na występowanie zbieżności w obrębie osobowościowych czynników ryzyka problematycznego korzystania z poszczególnych serwisów. W związku z tym, w kontekście wyjaśniania mechanizmów rozwoju problemowej zależności istotne wydaje się wyodrębnianie czynników (cech) specyficznych (w tym takich, które korespondują z samą istotą aktywności na portalach społecznościowych jaką jest autoprezentacja i nawiązywanie relacji z innymi). Kolejnym krokiem powinno być natomiast poszukiwanie, charakterystycznych dla tych cech, motywów, sposobów radzenia sobie i regulacji emocji. Zgodnie z obowiązującymi modelami specyficznych zaburzeń związanych z korzystaniem z Internetu (Brand i in., 2016), to właśnie indywidulana podatność użytkownika oraz związane z nią czynniki motywacyjne i emocjonalne, wchodząc w interakcję z konkretną przestrzenią internetową, przyczyniają się do uruchamiania mechanizmów gratyfikacji i kompensacji, a w konsekwencji mogą prowadzić do rozwoju zaburzenia.

W związku z powyższym, w dalszej części mojego projektu doktorskiego skupiłam się na poszukiwaniu takich czynników osobowościowych oraz związanych z nimi motywów i strategii samoregulacji, które korespondują ze specyfiką samej aktywności, jaką jest

korzystanie z portali społecznościowych. W tym kontekście, narcyzm wydaje się ważną zmienną pozwalającą wyjaśniać mechanizmy wchodzenia w problematyczną zależność. Co istotne, we wcześniejszych badaniach nad osobowościowymi uwarunkowaniami problematycznego korzystania z portali społecznościowych narcyzm nie był traktowany jako cecha wielowymiarowa. W związku z tym, ujęcie tak szerokiego wachlarza aspektów tej cechy, a także wyjaśnianie związków tych aspektów w oparciu o motywy związane z Ja dostarczyło nowych informacji. Badania prowadzone w ramach projektu doktorskiego wskazują, że **związek pomiędzy narcyzmem a problematycznym korzystaniem z portali społecznościowych może być wyjaśniany przez dwa podstawowe motywy związane z Ja: wzmacnianie Ja oraz ochronę Ja.** Czerpanie gratyfikacji w postaci wzmacniania siebie, które do tej pory było wiązane w literaturze z narcyzmem wielkościowym (Gnambs, Appel, 2018; McCain, Campbell, 2018), możemy kojarzyć ze ścieżką nagrody i nastawienia na uzyskiwanie wzmocnień społecznych. W kontekście narcystycznego motywu związanego z ochroną Ja, wyniki wskazują, że problematyczne korzystanie z portali społecznościowych może być rezultatem kompensacyjnego radzenia sobie deficytami w zakresie kompetencji społecznych i wrażliwością interpersonalną (rola narcyzmu wrażliwego), a także wynikać z nieadaptacyjnej regulacji emocjonalnej wśród osób nieufnych i wrogo nastawionych do innych ludzi (rola narcyzmu rywalizacyjnego), co koresponduje z założeniami hipotezy o mechanizmie związanym z doświadczaniem lęku i kompensacją deficytów.

Kolejnych informacji o związku narcyzmu z problematycznym korzystaniem z portali społecznościowych dostarczyło włączenie do modelu wyjaśniającego specyficznych oczekiwań, związanych z czerpaniem wzmocnień w kontekście korzystania z portali społecznościowych. Opierając się na założeniach modelu I-PACE, dołączyliśmy do naszych analiz dwa poznawcze czynniki związane z oczekiwaniem wzmocnień pozytywnych i negatywnych. Wyniki ostatniego badania pozwoliły ponownie wykazać, że zarówno aspekty

narcyzmu związane z motywem wzmacniania Ja, jak i ochrony Ja są pozytywnie związane z problematycznym korzystaniem z portali społecznościowych. Niemniej, w opozycji do wcześniejszych założeń skupiających się przede wszystkim na narcystycznym motywie wzmacniania siebie, wykazaliśmy że to aspekty narcyzmu związane z ochroną Ja (narcyzm rywalizacyjny i narcyzm wrażliwy) były silniej związane z tym zaburzeniem. Co równie istotne, za związek pomiędzy trzema aspektami narcyzmu (narcystycznym podziwem, narcyzmem rywalizacyjnym oraz narcyzmem wrażliwym), a problematycznym korzystaniem z portali społecznościowych odpowiada przede wszystkim oczekiwanie ulgi w doświadczaniu nieprzyjemnych stanów wewnętrznych oraz potrzeba ucieczki od problemów przeżywanych w rzeczywistości offline (oczekiwanie wzmocnień negatywnych). Biorąc pod uwagę powyższe wyniki, warto podkreślić, że wnoszą one nowe światło na rozumienie relacji pomiędzy narcyzmem, a problematycznym korzystaniem z portali społecznościowych. Narcyzm jako czynnik ryzyka problematycznego korzystania z portali społecznościowych łączony był dotychczas przede wszystkim z chęcią autopromocji i dążeniem do pozyskiwania nagród, w postaci pozytywnych informacji zwrotnych ze strony innych użytkowników (Andreassen i in., 2017), a więc wyjaśnienia te opierały się przede wszystkim na tej charakterystyce narcyzmu, która związana jest z motywem wzmacniania Ja i ścieżką poszukiwania nagród. **Prezentowany cykl badań dostarcza przesłanek, że w przypadku narcyzmu, w szczególności tych jego aspektów, które są związane z motywem ochrony Ja, mechanizm wchodzenia w problematyczną zależność od portali społecznościowych bazuje na tendencjach do eskapizmu, potrzebie ulgi od przeżywania negatywnych emocji oraz kompensacji trudności doświadczanych w świecie poza Internetem.** Prezentowane badania podkreślają tym samym perspektywę, która wiąże dane zjawisko z innymi problemami o charakterze nałogu. Motywy zachowań nałogowych oraz idące za nimi mechanizmy wzmocnień odgrywają ważną rolę w przechodzeniu od zachowań rekreacyjnych do problemowych (Kuntsche i in.,

2005; Merrill i in., 2015). Badania nad uzależnieniami od substancji psychoaktywnych oraz uzależnieniami od czynności wskazują na potencjalną dwutorowość mechanizmów rozwoju problematycznych zachowań, które mogą opierać się zarówno na mechanizmach związanych z poszukiwaniem nagród jak i z poszukiwaniem ulgi (Heinz i in., 2003; Verheul i in., 1999). W tym kontekście motywy związane z Ja oraz oczekiwania dotyczące zaspokajania potrzeb związanych z tymi motywami, które kształtowane są na gruncie specyficznych predyspozycji osobowościowych, czy innych form psychopatologii, mogą warunkować problematyczne zachowania.

Podsumowując, poprzez naświetlenie relacji pomiędzy poszczególnymi aspektami narcyzmu i związanymi z nim motywami Ja, a problematycznym korzystaniem z portali społecznościowych, niniejszy projekt stanowi wkład we współczesne dociekania z zakresu psychologii osobowości i psychologii klinicznej, a także przyczynia się do lepszego zrozumienia psychologicznego podłoża problematycznych zachowań w Internecie.

**Implikacje praktyczne zrealizowanego projektu doktorskiego**

Mimo, iż prezentowany projekt doktorski zawiera badania podstawowe, może on stanowić pewną wskazówkę dla oddziaływań praktycznych. Problematyczne korzystanie z portali społecznościowych postrzegane jest jako dezadaptacyjna strategia na zaspokajanie potrzeb psychologicznych i społecznych. W związku z tym, na występowanie problemu narażone są w szczególności osoby, które nie posiadają emocjonalnych i społecznych zasobów, takich jak stabilny i pozytywny obraz Ja, umiejętność nawiązywania i podtrzymywania relacji interpersonalnych, czy radzenie sobie ze stresem i negatywnymi emocjami. Prezentowane badania sugerują, że takie osoby mogą sięgać po łatwo dostępne i niewymagające wysiłku sposoby radzenia sobie i samoregulacji w postaci kompulsywnego korzystania z portali społecznościowych. W kontekście narcyzmu jako osobowościowego czynnika ryzyka, badania ujęte w projekcie wskazują, że angażowanie się w nadmierne korzystanie z portali

społecznościowych może być jednym z działań chroniących ego. Co ważne, powyższe obserwacje są zgodne z ogólną perspektywą badaczy i terapeutów zajmujących się tym problemem (Dalvi-Esfahani i in., 2019) Wyniki prezentowanych badań mogą znaleźć zastosowanie w projektowaniu oddziaływań profilaktycznych oraz tworzeniu programów terapeutycznych wobec osób nadużywających aplikacji internetowych. W kontekście klinicznym, osoby z podwyższonym poziomem narcyzmu mogłyby odnieść korzyści z kontrolowanego i świadomego ograniczenia korzystania z tych serwisów. Biorąc pod uwagę, że intensywne korzystanie z portali społecznościowych to przede wszystkim domena adolescentów i młodych dorosłych, to oddziaływania profilaktyczne i psychoedukacje wobec tych grup powinny uwzględnić także wątek związany z budowaniem pozytywnego obrazu własnej osoby oraz nauki zdrowych sposobów samoregulacji, które nie są oparte wyłącznie na korzystaniu z nowych technologii. Ponadto, osoby cierpiące na narcystyczne zaburzenie osobowości powinny być badane pod kątem ich codziennego czasu spędzanego na korzystaniu z portali społecznościowych. Jeśli angażują się w nadmierne korzystanie, w postępowaniu psychoterapeutycznym należy wprowadzić modyfikację aktywności online, a także interwencje koncertujące się na zmianie specyficznych oczekiwań i przekonań związanych z aktywnością w sieci. Biorąc pod uwagę powyższe wyniki, istotne byłoby zaadresowanie przede wszystkim problemów związanych z występowaniem zniekształceń poznawczych związanych z obrazem siebie, które z kolei wiązać się mogą z nieadaptacyjnymi sposobami samoregulacji, co sugeruje powodzenie interwencji poznawczo-behawioralnych wobec tych osób.

**Ograniczenia i kierunki przyszłych badań**

Badania zrealizowane w ramach niniejszego projektu nie są wolne od ograniczeń. Po pierwsze, wszystkie przeprowadzone badania miały charakter badań poprzecznych, co uniemożliwia wyciąganie wniosków o charakterze przyczynowo-skutkowym. W związku z tym, o kierunku zależności pomiędzy czynnikami osobowościowymi, a problematycznym

korzystaniem z portali społecznościowych możemy wnioskować jedynie na podstawie założeń teoretycznych. Co równie istotne, charakterystycznym wzorcem obserwowanym w uzależnieniach, jest przejście od motywów opartych na nagrodzie we wczesnych etapach rekreacyjnych do motywów opartych na uldze w późniejszych lub bardziej problematycznych stadiach nałogu (Liu i in., 2021). W przypadku różnych zachowań nałogowych, badania konsekwentnie pokazują, że osoby z poważniejszymi czy przewlekłymi wzorcami zazwyczaj zgłaszają wyższe motywy oparte na uldze. W związku z tym, ciekawym kierunkiem dalszych badań byłoby sprawdzenie związku poszczególnych aspektów narcyzmu z oczekiwaniami dotyczącymi doświadczania nagrody i ulgi oraz ich wpływem na rozwój problematycznego korzystania z portali społecznościowych w badaniach podłużnych, a także sprawdzenie powyższych zależności w grupie osób, które poddawane są oddziaływaniom terapeutycznym z powodu problemów związanych z nadmiernych korzystaniem z aplikacji internetowych.

Prezentowany projekt zawiera badania w większości prowadzone w Polsce, wśród młodych dorosłych, będących w dużej części studentami. W związku z tym, choć wyniki prezentowane w niniejszej rozprawie mogą dość wiernie oddawać relacje pomiędzy badanymi zmiennymi w populacji młodych dorosłych, to jednak możliwość ich generalizacji na inne grupy wiekowe jest ograniczona. Próbą wyjścia poza powyższe ograniczenia było włączenie do badań dwóch prób ogólnopolskich (zob. ARTYKUŁ 4), oraz ostatniego badania, które prowadzone było w Polsce i w Niemczech (zob. ARTYKUŁ 5). Dzięki zapewnieniu finansowania w ramach konkursu UGrants-Start, będę miała okazję w roku 2023 prowadzić badania w trzech różnych kontekstach kulturowych – w Polsce, w Niemczech i w Stanach Zjednoczonych. Badania te dostarczą szerszych i zróżnicowanych kulturowo danych dotyczących związku pomiędzy narcyzmem, motywami korzystania z tych serwisów, autentycznością i zgodnością z Ja, a problematycznym korzystaniem z portali społecznościowych i zdrowiem psychicznym.

W prezentowanych badaniach opieraliśmy się na metodach kwestionariuszowych, które są podatne na zniekształcenia wynikające, m.in., ze stylów odpowiadania, potrzeby aprobaty społecznej czy potrzeby autoprezentacji. Ograniczeniem prezentowanych badań jest także fakt, że narzędzie mierzące oczekiwania związane z korzystaniem z portali społecznościowych, mierzyło (w kontekście narcyzmu) oczekiwania niespecyficzne - dążenie do przyjemnych stanów, lub chęć ucieczki od przykrych doświadczeń. Pytania te nie odnosiły się więc wprost do relacji tych oczekiwań z Ja. Może być to przyczyną słabych związków narcyzmu z oczekiwaniem pozytywnych wzmocnień i wymaga dalszych badań oraz opracowania skali, która mierzyłyby wprost motywy wzmacniania Ja i ochrony Ja na portalach społecznościowych. W tym kontekście należałoby uwzględnić bardziej specyficzne dla narcyzmu mechanizmy nagrody (np. bycie lepszym od innych, porównania społeczne w dół, dewaluacja innych, oraz sygnalizowanie nadzwyczajnych osiągnięć lub moralności).

Na koniec należy podkreślić, że wykorzystywane w projekcie narzędzia nie uprawniają do stawiania diagnozy o uzależnieniu od portali społecznościowych. Są to narzędzia przesiewowe, służące do oceny nasilenia objawów w badań ilościowych na populacji ogólnej. W związku z tym, opieraliśmy się jedynie na deklaracji doświadczania symptomów zaburzenia. Kolejne dociekania empiryczne powinny uwzględnić także czynniki związane z sytuacyjnym kontekstem korzystania z portali społecznościowych (np. zachowania wzmacniające i chroniące ego), które mogą prowadzić do nieadaptacyjnej regulacji emocjonalnej. W tym kontekście badania dzienniczkowe oraz badania metodą pobierania próbek doświadczenia (ang. *Experience Sampling Method*) stanowią duży potencjał w dążeniu do bardziej dynamicznego pomiaru powyższych procesów. Dzięki uzyskaniu finansowania w ramach grantu Preludium 19 przeprowadziłam badania wykorzystujące metodę dzienniczkową ($N$ = 89 użytkowników portali społecznościowych, który wypełnili trwające 28 dni badanie dzienniczkowe) oraz metodę pobierania próbek doświadczenia ($N$ = 268 użytkowników portali społecznościowych,

którzy wzięli udział w trwającym tydzień badaniu metodą pobierania próbek doświadczenia przy pomocy aplikacji mobilnej; około 9 000 tysięcy obserwacji bieżącego doświadczenia). Zebrane dane pozwolą mi na analizę związków pomiędzy narcyzmem, a sytuacyjnymi wyzwalaczami związanymi z aktywnością na portalach społecznościowych, a także bieżącym występowaniem czynników emocjonalno-motywacyjnych oraz pojawianiem się i nasileniem objawów problematycznego korzystania z portali społecznościowych.

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We, the undersigned, co-authors of the above publication, confirm that the above publication has not been submitted as evidence for which a degree or other qualification has already been awarded.

We, the undersigned, further indicate the candidate's contribution to the publication in our joint statement below.

**Statement indicating the candidate's contribution to the publication:** The candidate contributed to the study design and concept, literature search, data collection, data interpretation, generation of the initial draft of the manuscript, manuscript preparation and editing, and final editing.

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Full length article

# Facebook addiction among Polish undergraduate students: Validity of measurement and relationship with personality and well-being☆

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ABSTRACT

Facebook addiction has been suggested as a potential behavioral addiction emerging from the framework of the theory and research on social networking sites addiction and Internet addiction. Previous studies showed that Facebook addiction is related to specific personality traits and well-being. However, there is still a scarcity of studies showing the relative contribution of different personality characteristics to Facebook addiction within an integrated model. In addition, few studies have investigated the unique contribution of Facebook addiction in terms of explaining different facets of well-being above and beyond personality characteristics previously shown to be related to psychosocial functioning. The present study demonstrates validation of the Bergen Facebook Addiction Scale (BFAS) in the sample of Polish students and a tentative integrated model of potential Facebook addiction personality risk factors. BFAS was administered to 1157 students. In addition, participants were asked about demographic variables, and personality traits (Big Five, self-esteem, self-efficacy, narcissism), loneliness, social anxiety, and well-being indicators were measured. BFAS had acceptable fit with the data and demonstrated good reliability. The investigated model showed that Facebook addiction was related to higher extraversion, narcissism, loneliness, social anxiety, and lower general self-efficacy. Facebook addiction was further related to impoverished well-being (impaired general health, decreased sleep quality, and higher perceived stress), which is congruent with previous findings.



## 1. Introduction

New technological solutions may be useful tools in managing health related behaviors, and as such merit study in the psychological framework (Shin & Biocca, 2017; Shin, 2018; Shin, Lee, & Hwang, 2017). However, increasing amount of data shows that they can also be abused. Numerous studies have been conducted on Internet addiction (Chou, Condron, & Belland, 2005; D'Hondt & Maurage, 2017; Kuss, Griffiths, Karila, & Billieux, 2014; Kuss & Lopez-Fernandez, 2016; Weinstein & Lejoyeux, 2010; Widyanto & Griffiths, 2006; Young, 1996). Nevertheless, it has been questioned whether this reflects an addiction to the platform, to the content, or to the activity performed (Griffiths, 1999, 2000; Young, 2009). Similar doubts were raised when the Facebook addiction concept emerged (Griffiths, 2012). However, there are important premises which warrant systematic study of Facebook addiction.

Among Social Networking Sites (SNSs), Facebook is by far the most popular one. It involved on average 1.23 billion daily active users and 1.86 billion monthly active users in December 2016 (Facebook, 2017). In Poland there are 15.53 million registered members. Studies show differences between users that prefer different online activities (Thompson, 2001). Furthermore, even within the social networking sites users there are variations in motivations of usage (Gülnar, Balcı, & Çakır, 2010; Mull & Lee, 2014). This could be related to different forms of gratification drawn from using a particular site and distinct needs underlying this use. In line with this, it is crucial to separate out results from specific sites in order to understand the development of SNSs

☆ Validity of Measurement and Relationship with Personality and Well-Being.

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(Ryan, Chester, Reece, & Xenos, 2014). In addition, it seems that Facebook has the strongest addictive quality and the strongest potential negative consequences for younger populations (Denti et al., 2012). Therefore, studies on its risk factors among primary, secondary and tertiary education students are warranted.

Social Network Sites addiction is defined as "being overly concerned about SNSs, driven by a strong motivation to log on to or use SNSs, and to devote so much time and effort to SNSs that it impairs other social activities, studies/job, interpersonal relationships, and/or psychological health and well-being" (Andreassen & Pallesen, 2014, p. 4054). This definition also refers to the Facebook addiction, as an example of SNS addiction. Therefore, one of the main aims of this study was to investigate whether Facebook addiction can be validly and reliably measured among university students.

### 1.1. Bergen Facebook Addiction Scale

The Bergen Facebook Addiction Scale (Andreassen, Torsheim, Brunborg, & Pallesen, 2012) is based on the six core components of addiction distinguished by Griffiths (2005). It includes six statements concerning symptoms experienced during the past 12 months. The responses are provided on a 5-point Likert scale ranging from *very rarely* (1) to *very often* (5). Higher scores indicate higher levels of Facebook addiction. The Polish adaptation of BFAS has shown good validity and reliability in previous research (Charzyńska & Góźdź, 2014). In line with the aforementioned conceptualization of addiction, other measures of distinct behavioral addictions have been created and have shown good validity and reliability, such as the Bergen Work Addiction Scale (Andreassen et al., 2012; Atroszko, Pallesen, Griffiths, & Andreassen, 2017), the Bergen Study Addiction Scale (Atroszko, Andreassen, Griffiths, & Pallesen, 2015) Game Addiction Scale for Adolescents (Lemmens, Valkenburg, & Peter, 2009), the Exercise Addiction Inventory (Terry, Szabo, & Griffiths, 2004), Problematic Pornography Consumption Scale (Bőthe et al., 2017) and the Bergen Shopping Addiction Scale (Andreassen et al., 2015).

### 1.2. Aims of the study

Taking into account the current and rapidly growing research on behavioral addictions (Karim & Chaudhri, 2012) the aim of this study was to provide data on the validity and reliability of the measurement of Facebook addiction. For this purpose the BFAS was administered to undergraduate students. Moreover, the study aims to investigate the relative contribution of different personality characteristics to Facebook addiction within an integrated model, as well as the unique contribution of Facebook addiction in terms of explaining different facets of well-being above and beyond personality characteristics that consistently have been shown to be related to psychosocial functioning (Burger & Samuel, 2017; Pinquart & Sörensen, 2000; Ryan & Deci, 2001). A tentative integrated model of personality factors that may represent risk factors for Facebook addiction is of significant importance, not only to ease understanding of this addiction, but also from the perspective of prevention and therapy, as it identifies crucial areas related to personality which should be addressed in such interventions.

### 1.3. Facebook addiction and personality

Personality traits have been identified as risk factors for various behavioral addictions (Andreassen et al., 2013). With reference to the Big Five personality model, there have been shown positive relationships between addictive tendencies and neuroticism (Andreassen, Torsheim et al., 2012; Błachnio, Przepiorka, Benvenuti et al., 2016; Błachnio, Przepiórka, Senol-Durak, Durak, & Sherstyuk, 2017; Mahmood & Farooq, 2014) and negative relationships between Facebook addiction and conscientiousness (Andreassen, Torsheim et al., 2012; Andreassen et al., 2013; Błachnio, Przepiorka, Benvenuti et al., 2016; Błachnio, Przepiórka, Senol-Durak et al., 2017; Tang, Chen, Yang, Chung, & Lee, 2015). Moreover, some studies show positive relationships between Facebook addiction and extraversion (Andreassen, Torsheim, et al, 2012; Andreassen et al., 2013) and negative relationships between Facebook addiction and openness to experience (Andreassen et al., 2013; Błachnio; Przepiórka, Senol-Durak, Durak; Sherstyuk, 2017; Błachnio, Przepiorka, Benvenuti et al., 2016). General self-efficacy has been identified as an important factor in addiction, as it is related to the motivation to initiate or to resist the addictive behavior (Marlatt, Baer, & Quigley, 1995). Furthermore, low self-efficacy predicts Internet Communication Disorder (Wegmann & Brand, 2016). Although, self-efficacy is not related to Facebook intensity and Facebook intrusion (Błachnio, Przepiórka, & Czuczwar, 2017), the insufficient self-control and low level of failure-related action orientation can put Facebook users "at-risk" of Facebook addiction (Błachnio & Przepiórka, 2016). Moreover, studies show that narcissism is positively related to SNS addiction (Andreassen, Pallesen, & Griffiths, 2016), as well as, Facebook addiction (Malik & Khan, 2015). Furthermore, people with low self-esteem regard social media as a safer place to express themselves than people with high self-esteem (Forest & Wood, 2012). In line with these findings, excessive SNS use was found to be related to lower self-esteem (Andreassen et al., 2016; Błachnio, Przepiórka, & Rudnicka, 2016; Malik & Khan, 2015; Wilson, Fornasier, & White, 2010).

### 1.4. Facebook addiction and social functioning

Although in the field of SNS use and addiction, researchers have distinguished between a large number of motivations to use it (Chen & Kim, 2013; GlobalWebIndex, 2016; Huang, 2012; Mull & Lee, 2014; Ryan et al., 2014), numerous studies have emphasized relationship maintenance as a key reason for Facebook use (Joinson, 2008; Raacke & Bonds-Raacke, 2008; Sheldon, 2009; Valentine, 2012) as well as for all SNS use (Kuss & Griffiths, 2011). In line with this, studies show that Facebook addiction is related to poor social functioning, e.g. relationship dissatisfaction (Elphinston & Noller, 2011), loneliness (Błachnio et al., 2016), social anxiety (Dobrean & Păsărelu, 2016), and lack of social support (Tang et al., 2015), as well as preference for online social interaction (POSI; Lee, Cheung, & Thadani, 2012). Individuals who suffer from psychosocial problems may prefer online social interaction over face-to-face conversation, thus the POSI may facilitate compulsive Internet use that results in negative outcomes (Caplan, 2003). On the other hand, it should also be taken into account that online social networking may have positive influence on social functioning (Burke, Marlow, & Lento, 2010; Ellison, Steinfield, & Lampe, 2007; Steinfield, Ellison, & Lampe, 2008).

### 1.5. Facebook addiction and well-being

The crucial requirement for considering behavior as addictive is the negative consequences that it brings for the psychosocial functioning of the individual and/or people close to him/her (Andreassen & Pallesen, 2014; Atroszko, 2012; Griffiths, 2005). Thus far, Facebook addiction has been linked to lower subjective well-being (Denti et al., 2012; Kross et al., 2013), lower life satisfaction (Błachnio et al., 2016; Satici & Uysal, 2015), as well as lower subjective happiness and subjective vitality (Uysal, Satici, & Akin, 2013). In the context of health, Facebook addiction has in addition been related to insomnia, poor sleep quality, and somatic

symptoms (Andreassen, Torsheim et al., 2012; Hanprathet, Manwong, Khumsri, Yingyeun, & Phanasathit, 2015; Koc & Gulyagci, 2013; Wolniczak et al., 2013). Also, using social networks can increase stress. The longitudinal study of Campisi et al. (2012) showed that Facebook users find use of the social network to be stressful and generating negative emotions. Another study showed that online chatting is associated with prolonged stress, at least for women (Thomée, Eklöf, Gustafsson, Nilsson, & Hagberg, 2007). What is more, meta-analysis showed that Internet addiction is associated with tendency to escape from self, insufficient self-control, difficulties in emotional regulation, and negative stress coping (Koo & Kwon, 2014). These findings can be applied to the social skill model of generalized problematic Internet use (Caplan, 2010). According to this model those who prefer online communication are at greater risk of addiction. Moreover, individuals who manifest deficient self-regulation of Internet use tend to engage in social media to release stress and improve mood. Communicating online relieves negative moods, which then reinforces online use.

### 1.6. Tentative model of Facebook addiction risk factors

On the basis of the existing literature and understanding of addiction in the context of stress coping/emotion regulation (Jacobs, 1986) we suggest a tentative model in which Facebook addiction would be a result of ineffective mood regulation by individuals who have problematic social life, specifically those who have high social anxiety and loneliness, as well as general emotional instability, low self-esteem, and low general self-efficacy combined with low openness to new experience. At the same time these individuals are typically extraverted and narcissistic, therefore they crave for social interaction, especially self-validation through these interactions. Consequently, because underlying causes of distress are not confronted and dealt with by these individuals due to their low general self-efficacy, the increasingly compulsive Facebook activity generates additional stress and, in consequence, negatively affects their psychosocial functioning.

### 1.7. Hypotheses

On the basis of previous research and theoretical frameworks, it was hypothesized that (i) the Bergen Facebook Addiction Scale has a single factor solution in the student sample (H1); (ii) low emotional stability, conscientiousness, and openness to experience, as well as high extraversion would be positively related to Facebook addiction (H2); (iii) high narcissism, low self-esteem and low self-efficacy would be positively related to Facebook addiction (H3); (iv) loneliness and social anxiety would be positively related to Facebook addiction (H4); (v) Facebook addiction would be related to impaired well-being (lower quality of life, sleep quality, general health and higher stress) (H5).

## 2. Methods

### 2.1. Sample

The sample comprised 1182 undergraduate students. Due to missing data on relevant variables, 25 participants were eliminated from the analyses. When data were missing at random and only a very small portion of data were missing (less than 2% overall), missing data were imputed using Missing Values Analysis within SPSS 24.0. This algorithm provides unbiased parameter estimates and improves statistical power of analyses (Enders, 2001; Scheffer, 2002). The final sample therefore comprised 1157 full-time students: 601 females (51.9%), 546 males (47.2%) and 10 persons (0.9%) who did not report gender, with mean age of $M = 20.33$ years ($SD = 1.68$). The individuals were studying at the universities from Gdańsk: University of Gdańsk, Gdańsk Technological University, Gdańsk University of Sport and Recreation. Students were affiliated with different faculties, courses of study and years of study.

### 2.2. Instruments

*Facebook addiction*. The Polish adaptation (Charzyńska & Góźdź, 2014) of the Bergen Facebook Addiction Scale (BFAS; Andreassen, Torsheim et al., 2012) includes 6 items that are based on core addiction components (Griffiths, 2005). The questions concern symptoms experienced during the past 12 months. The responses are provided on a 5-point Likert scale ranging from *very rarely* (1) to *very often* (5). Higher scores indicate greater Facebook addiction. The BFAS has shown good validity and reliability in previous research (Charzyńska & Góźdź, 2014). In the present sample the Cronbach's alpha reliability coefficient was 0.86.

*Personality.* The Polish version (Atroszko, 2015) of Ten Item Personality Inventory (TIPI; Gosling, Rentfrow, & Swann, 2003) was used to assess the five-factor model of personality: Extraversion, Agreeableness, Conscientiousness, Emotional stability, and Openness to experience. Respondents provided answers on a 7-point Likert scale, ranging from *strongly disagree* (1) to *agree strongly* (7). Each of Big Five factors is measured with two items, one for its positive extremity and one for its negative extremity. It has shown good validity and reliability in previous research (Atroszko, Andreassen, Griffiths, & Pallesen, 2016a, 2016b; Atroszko, 2015). In the present sample the Spearman-Brown reliability coefficient was of 0.68 for Extraversion, 0.29 for Agreeableness, 0.65 for Conscientiousness, 0.56 for Emotional stability and 0.28 for Openness to experience. These were very similar to the ones obtained in the original version of the scale, which were 0.68, 0.40, 0.50, 0.73, and 0.45 respectively. As the authors of the scale argue, TIPI demonstrates good validity and biased estimates of reliability using internal consistency measures should be expected due to very small number of items. Therefore, less biased measures of reliability should be used, such as the test–retest reliability, which for the original scale yielded acceptable correlations between two measurements with 6-week interval between them, varying from 0.62 for Openness to .77 for Extroversion.

Self-efficacy was measured by two items based on the General Self-Efficacy Scale (GSES; Schwarzer & Jerusalem, 1995). The measure was developed by the authors of this paper and included the following items: “I can usually handle whatever comes my way” and “I can solve most problems if I invest the necessary effort”. Respondents provided answers on a 9-point Likert scale, from *no* (1) to *yes* (9). The two items have the highest content validity and the current presented data supports its criterion validity, congruent with previous results with the full version of the scale (Schwarzer, Jerusalem, & Juczyński, 2012). In the present sample the Spearman-Brown reliability coefficient was of 0.81.

Single Item Narcissism Scale (SINS) described by Konrath, Meier, and Bushman (2014) was used to measure narcissism. A Polish adaptation developed by the authors of this paper was used. The participants were presented the following statement: “I am a narcissist (Note: The word ‘narcissist’ means egotistical, self-focused, and vain)” with response range from *no* (1) to *yes* (9). In this study response format has been extended to a 9-point scale. The item has shown good validity and reliability in previous research (Konrath et al., 2014), and currently presented data supports its criterion validity, congruent with previous results.

*Self-esteem.* Self-esteem was measured with a single-item scale developed by Atroszko et al. (2017) on the basis of item from WHOQOL Bref scale (Skevington, Lotfy, & O'Connell, 2004). The following question was asked: “How satisfied are you with

yourself?" with 9-point response scale, from *very dissatisfied* (1) to *very satisfied* (9). The scale has shown good validity and reliability in previous research (Atroszko, Sawicki et al., 2017), and it has been argued that its indirect character may provide a better estimate of self-esteem than direct questions about "having high self-esteem". In previous study the intraclass correlation coefficient (ICC) for test-retest reliability was 0.79.

*Loneliness.* It was measured by a Polish adaptation (Atroszko, 2015) of the Short Loneliness Scale (SLS; Hughes, Waite, Hawkley, & Cacioppo, 2004), which includes 3 items with a 3-point response format scale, ranging from *almost never or never* (1) to *often* (3). The scale has shown good validity and reliability in previous research (Atroszko, 2015; Atroszko et al., 2015; Atroszko et al., 2015; Atroszko et al., 2015; Atroszko et al., 2017; Atroszko, Sawicki et al., 2017; Sendal, Sawicki, Bagińska, & Atroszko, 2016). In the present sample the Cronbach's alpha reliability coefficient was 0.79.

*General health, sleep quality, and quality of life.* Three questions were measured with ultra-brief scales developed by Atroszko (2015) based on the items from WHOQOL Bref scale (Skevington et al., 2004). General health was measured by the question: "How satisfied are you with your health?" with 9-point response scale, from *very dissatisfied* (1) to *very satisfied* (9). Sleep quality was measured by the question: "How satisfied are you with your sleep?" with 9-point response scale, from *very dissatisfied* (1) to *very satisfied* (9). Quality of life was measured by the question: "How would you rate your quality of life?" with a 9-point response scale, from *very poor* (1) to *very good* (9). The scales have shown good validity and reliability in previous research (Atroszko, Andreassen, et al., 2015; Atroszko, Bagińska, et al., 2015).

*Social anxiety.* Social anxiety was measured with a shortened Polish version (see Dąbkowska, 2008) of Liebowitz Social Anxiety Scale (LSAS; Liebowitz, 1987). It consists of nine items from the original scale concerning the component of fear experienced in social situations. The responses are provided on a 4-point scale ranging from *none* (0) to *severe* (3). The Cronbach's alpha reliability coefficient of social anxiety in this sample was .83. Currently presented data supports its criterion validity, congruent with previous results (Baker, Heinrichs, Kim, & Hofmann, 2002).

*Stress.* Perceived stress was measured by a Polish adaptation (Atroszko, 2015) of the Perceived Stress Scale (PSS-4; Cohen, Kamarck, & Mermelstein, 1983). It consists of four items with a 5-point Likert response format scale, ranging from *never* (1) to *very often* (5). The scale has shown good validity and reliability in previous research (Atroszko, 2015; Atroszko, Andreassen, et al., 2015; Atroszko, Bagińska, et al., 2015; Atroszko, Krzyżaniak, et.al., 2015; Atroszko, Pianka, et al., 2015; Atroszko, Sawicki, Mąkinia, et al., 2017; Atroszko, Sawicki, Sendal, et al., 2017; Sendal et al., 2016). The Cronbach's alpha reliability coefficient in this sample was .69.

The TIPI, PSS-4, Short Loneliness Scale, and the measures of general health, sleep quality, and quality of life have been extensively validated in a sample of 3621 undergraduate Polish students from several universities across Poland, providing data supporting their construct validity and good reliability (Atroszko, 2015).

### 2.3. Procedure

Data collection was based on convenience sampling. Students were invited to participate anonymously in the study during lectures or classes. The estimated response rate was above 95%. Participation in the study was totally anonymous and no monetary or other material rewards were offered.

### 2.4. Statistical analyses

Mplus 6.11 (Muthén & Muthén, 1998–2010) was used to perform factor analyses. Robust Maximum Likelihood (RML) estimator was used due to nonnormality of distributions of items. The latent variable was scaled by fixing factor variance to one. Missing data were handled with the expectation-maximization (EM) algorithm. Following measures were used to evaluate fit of the model: $\chi^2$ divided by degrees of freedom ($\chi^2/df$), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Root Mean Squared Error of Approximation (RMSEA). Cut-off scores for those indexes for acceptable fit are: $\chi^2/df \leq 3$, CFI $\geq$0.95, TLI $\geq$0.95, RMSEA $\leq$0.06 to 0.08 (Hu & Bentler, 1999; Schreiber, Nora, Stage, Barlow, & King, 2006).

Means, standard deviations, percentages, and correlation coefficients were calculated. Five hierarchical regression analyses were conducted where Facebook addiction, stress, general health, sleep quality, and quality of life were dependent variables. Independent variables introduced in subsequent steps can be found in Tables 2 and 3. For all linear regression analyses, preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. All tests were two-tailed and the significance level was set to $\alpha = 0.05$.

### 2.5. Ethics

The project was approved by the Research Ethics Committee at the Psychology Department of the University of Gdańsk. Attaining formal and written informed consent was not regarded as necessary as voluntary completion of the questionnaires was regarded as providing consent.

## 3. Results

### 3.1. Factor analysis

The model with one factor of Facebook addiction showed following fit indices: $\chi^2/df = 29.78$, CFI = 0.88, TLI = 0.79, RMSEA = 0.158 (90% CI = 0.142–0.174). Standardized factor loadings on items were: 0.75, 0.94, 0.70, 0.78, 0.72, 0.87, respectively. Due to the lack of acceptable model fit, residuals of the first and second item were correlated on the basis of modification indices similarly to previous studies (Charzyńska & Góźdź, 2014). The modified model had a good fit: $\chi^2$ (8) = 12.89 ($p = .012$), $\chi^2/df = 1.61$, CFI = 0.998, TLI = 0.996, RMSEA = 0.023 (90% CI = 0.000–0.045). Standardized factor loadings on items were: 0.60, 0.86, 0.71, 0.81, 0.74, 0.89, respectively. The correlation between residuals of the first and second item was 0.51.

### 3.2. Descriptive statistics

Table 1 presents mean scores, standard deviations, percentages, and correlation coefficients of the study variables.

### 3.3. Predictors of Facebook addiction

Regression analysis for Facebook addiction (see Table 2) showed that the independent variables explained a total of 11.6% of the variance of Facebook addiction, $F_{12,1124} = 12.26$, $p < .001$. Significant independent variables in Step 4 were gender ($\beta = -0.10$), showing that females score higher on Facebook addiction, age ($\beta = 0.07$), extraversion ($\beta = 0.17$), narcissism ($\beta = 0.17$), self-efficacy ($\beta = -0.12$), social anxiety ($\beta = 0.16$), and loneliness ($\beta = 0.07$).

**Table 1**
Mean scores and standard deviations (*SD*), percentages, and correlation coefficients (Pearson product-moment/point-biserial) between study variables.

| Variable | Mean (*SD*)/Percentages | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. | 11. | 12. | 13. | 14. | 15. | 16. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Facebook addiction | 12.15 (5.12) | – | | | | | | | | | | | | | | | |
| 2. Gender [a] | 51.9% females | −.13** | – | | | | | | | | | | | | | | |
| 3. Age | 20.33 (1.68) | .06* | −.04 | – | | | | | | | | | | | | | |
| 4. Extraversion | 8.88 (2.90) | .04 | −.10** | .01 | – | | | | | | | | | | | | |
| 5. Agreeableness | 9.71 (2.26) | −.05 | −.09** | −.02 | .07* | – | | | | | | | | | | | |
| 6. Conscientiousness | 9.37 (2.66) | −.07* | −.09** | .08** | .11** | .07* | – | | | | | | | | | | |
| 7. Emotional stability | 8.48 (2.76) | −.15** | .19** | .03 | .09** | .35** | .16** | – | | | | | | | | | |
| 8. Openness to experience | 9.92 (2.23) | −.07* | −.10** | −.06* | .37** | .04 | .10** | .02 | – | | | | | | | | |
| 9. Self-esteem | 5.85 (1.81) | −.10** | .06* | .09** | .32** | .15** | .29** | .31** | .22** | – | | | | | | | |
| 10. Narcissism | 3.81 (2.14) | .13** | .20** | .00 | .02 | −.36** | −.04 | −.08** | .03 | .04 | – | | | | | | |
| 11. Self-efficacy | 14.02 (2.67) | −.17** | .09** | .05 | .27** | .09** | .26** | .29** | .32** | .44** | .09** | – | | | | | |
| 12. Social anxiety | 18.29 (5.43) | .19** | −.17** | −.04 | −.39** | .08** | −.18** | −.20** | −.31** | −.32** | −.11** | −.39** | – | | | | |
| 13. Loneliness | 4.75 (1.70) | .13** | −.01 | −.11** | −.35** | −.05 | −.17** | −.26** | −.15** | −.42** | .03 | −.33** | .37** | – | | | |
| 14. Stress | 10.80 (2.97) | .22** | −.15** | −.06 | −.21** | −.05 | −.21** | −.32** | −.11** | −.48** | −.05 | −.42** | .35** | .38** | – | | |
| 15. General health | 6.09 (2.08) | −.15** | .04 | −.08** | .11** | .12** | .12** | .17** | .06* | .35** | −.04 | .20** | −.09** | −.14** | −.21** | – | |
| 16. Sleep quality | 5.23 (2.16) | −.11** | .04 | .05 | .07* | .06* | .06* | .19** | −.00 | .33** | .00 | .16** | −.12** | −.18** | −.25** | .41** | – |
| 17. Quality of life | 6.99 (1.39) | −.07* | −.07* | −.01 | .30** | .15** | .18** | .21** | .17** | .50** | −.02 | .43** | −.23** | −.37** | −.37** | .30** | .26** |

*$p < .05$. **$p < .01$.
[a] Point-biserial correlation coefficient (0 = female, 1 = male).

**Table 2**
Results of hierarchical multiple regression analyses in which age, gender, big five personality traits, self-esteem, narcissism, self-efficacy, social anxiety and loneliness were regressed upon the scores on BFAS ($n = 1137$).

| Predictor | β | $\Delta R^2$ |
|---|---|---|
| Step 1 | | .020** |
| Gender [a] | −.13** | |
| Age | .06 | |
| Step 2 | | .032** |
| Gender [a] | −.12** | |
| Age | .06 | |
| Extraversion | .08** | |
| Agreeableness | −.02 | |
| Conscientiousness | −.06* | |
| Emotional stability | −.12** | |
| Openness to experience | −.09** | |
| Step 3 | | .024** |
| Gender [a] | −.14** | |
| Age | .06* | |
| Extraversion | .09** | |
| Agreeableness | .04 | |
| Conscientiousness | −.05 | |
| Emotional stability | −.11** | |
| Openness to experience | −.09** | |
| Self-esteem | −.07* | |
| Narcissism | .16** | |
| Step 4 | | .040** |
| Gender [a] | −.10** | |
| Age | .07** | |
| Extraversion | .17** | |
| Agreeableness | .00 | |
| Conscientiousness | −.01 | |
| Emotional stability | −.05 | |
| Openness to experience | −.04 | |
| Self-esteem | .00 | |
| Narcissism | .17** | |
| Self-efficacy | −.12** | |
| Social anxiety | .16** | |
| Loneliness | .07* | |
| Total $R^2$ | | .116** |

*$p < .05$. **$p < .01$.
[a] 0 = female, 1 = male.

### 3.4. Facebook addiction as predictor of well-being

Regression analysis for stress (see Table 3) showed that the independent variables explained a total of 35.8% of the variance of stress, $F_{13,\ 1123} = 48.14$, $p < .001$. Significant independent variables in Step 5 were Facebook addiction (β = 0.10), gender (β = −0.05, $p = .055$), showing that females score higher on quality of life, emotional stability (β = −0.12), openness to experience (β = 0.06) self-esteem (β = −0.28), self-efficacy (β = −0.17), social anxiety (β = 0.09), and loneliness (β = 0.13).

Regression analysis for general health (see Table 3) showed that the independent variables explained a total of 15.6% of the variance of general health, $F_{13,1123} = 15.99$, $p < .001$. Significant independent variable in Step 5 were Facebook addiction (β = −0.11), age (β = −0.11), and self-esteem (β = 0.33).

Regression analysis for sleep quality (see Table 3) showed that the independent variables explained a total of 13.8% of the variance of sleep quality, $F_{13,1123} = 13.79$, $p < .001$. Significant independent variables in Step 5 were Facebook addiction (β = −0.08), emotional stability (β = 0.08), openness to experience (β = −0.08), and self-esteem (β = 0.32).

Regression analysis for quality of life (see Table 3) showed that the independent variables explained a total of 34.4% of the variance of quality of life, $F_{13,1123} = 45.26$, $p < .001$. Significant independent variables in Step 5 were gender (β = −0.11), showing that females score higher on quality of life, age (β = −0.07), extraversion (β = 0.09) self-esteem (β = 0.33), self-efficacy (β = 0.23), and loneliness (β = −0.14).

## 4. Discussion

### 4.1. Psychometric properties of BFAS

Factor-analytical results showed that original 6-item one factor solution had mediocre fit to the data. Examination of the modification indices showed that error term of Item 1 had substantial covariance with error term of Item 2. The results were similar to the results obtained by Charzyńska and Góźdź (2014). The error correlations were introduced also in the case of other addiction scales based on the core components of addiction, and it was suggested that it may be related to the fact that addiction, apart from the core compulsion, also includes general component of high time and energy investment concerning particular behavior measured by these scales (Atroszko et al., 2017). The 6-item one-factor solution of the Bergen Facebook Addiction Scale with correlated error terms had acceptable fit (H1 substantiated). All factor loadings were significant, with standardized values above 0.40. It has been recently suggested in the context of development of a work addiction scale

**Table 3**
Results of hierarchical multiple regression analyses in which Facebook addiction, age, gender, big five personality traits, self-esteem, narcissism, loneliness, self-efficacy and social anxiety were regressed upon the scores on anxiety, stress, general health, sleep quality and quality of life ($n = 1137$).

| Predictor | Stress | | General health | | Sleep quality | | Quality of life | |
|---|---|---|---|---|---|---|---|---|
| | β | $\Delta R^2$ | β | $\Delta R^2$ | β | $\Delta R^2$ | β | $\Delta R^2$ |
| Step 1 | | .046** | | .024** | | .014** | | .007** |
| Facebook addiction | .21** | | −.16** | | −.12** | | −.08** | |
| Step 2 | | .020** | | .005* | | .005 | | .007* |
| Facebook addiction | .20** | | −.15** | | −.12** | | −.09** | |
| Gender [a] | −.13** | | .02 | | .03 | | −.09** | |
| Age | −.07* | | −.07* | | .06* | | −.01 | |
| Step 3 | | .137** | | .044** | | .034** | | .138** |
| Facebook addiction | .16** | | −.12** | | −.10** | | −.06* | |
| Gender [a] | −.11** | | .02 | | .01 | | −.07* | |
| Age | −.05 | | −.08** | | .05 | | −.02 | |
| Extraversion | −.18** | | .09** | | .08* | | .25** | |
| Agreeableness | .07* | | .06 | | .00 | | .04 | |
| Conscientiousness | −.15** | | .09** | | .03 | | .11** | |
| Emotional stability | −.26** | | .11** | | .16** | | .16** | |
| Openness to experience | −.03 | | .00 | | −.04 | | .06 | |
| Step 4 | | .107** | | .080** | | .084** | | .136** |
| Facebook addiction | .15** | | −.11** | | −.09** | | −.04 | |
| Gender [a] | −.07** | | .00 | | −.02 | | −.10** | |
| Age | −.02 | | −.11** | | .03 | | −.06* | |
| Extraversion | −.09** | | .01 | | .00 | | .14** | |
| Agreeableness | .07* | | .03 | | −.01 | | .02 | |
| Conscientiousness | −.07* | | .02 | | −.05 | | .02 | |
| Emotional stability | −.18** | | .04 | | .09** | | .08** | |
| Openness to experience | .01 | | −.03 | | −.08* | | .01 | |
| Self-esteem | −.37** | | .33** | | .33** | | .42** | |
| Narcissism | −.02 | | −.03 | | .00 | | −.01 | |
| Step 5 | | .048** | | .003 | | .001 | | .056** |
| Facebook addiction | .10** | | −.11** | | −.08** | | −.00 | |
| Gender [a] | −.05† | | .01 | | −.02 | | −.11** | |
| Age | .00 | | −.11** | | .02 | | −.07** | |
| Extraversion | −.01 | | .03 | | −.01 | | .09** | |
| Agreeableness | .05 | | .02 | | −.01 | | .03 | |
| Conscientiousness | −.03 | | .02 | | −.05 | | −.01 | |
| Emotional stability | −.12** | | .05 | | .08* | | .02 | |
| Openness to experience | .06* | | −.03 | | −.08* | | −.03 | |
| Self-esteem | −.28** | | .33** | | .32** | | .33** | |
| Narcissism | −.01 | | −.03 | | .00 | | −.02 | |
| Self-efficacy | −.17** | | .04 | | .01 | | .23** | |
| Social anxiety | .09** | | .06 | | −.01 | | .01 | |
| Loneliness | .13** | | .02 | | −.03 | | −.14** | |
| Total $R^2$ | | .358** | | .156** | | .138** | | .344** |

*$p < .05$. **$p < .01$, †$p = .055$.
[a] 0 = female, 1 = male.

(Atroszko et al., 2017) that more attention should be devoted to measuring tools based on core components of addiction (Griffiths, 2005), as more clear delineation between high engagement and addiction is necessary (Griffiths, Demetrovics, & Atroszko, 2018).

### 4.2. Facebook addiction and personality

Before including all personality variables in the tested model there was a negative relationship between Facebook addiction and emotional stability as well as conscientiousness and openness to experience, which is congruent with previous studies (H2 substantiated) (Andreassen, Torsheim et al., 2012; Andreassen et al., 2013; Błachnio, Przepiorka, Benvenuti et al., 2016; Błachnio, Przepiórka, Sendol-Durak et al., 2017; Mahmood & Farooq, 2014; Tang et al., 2015). Furthermore, there was a positive relationship between Facebook addiction and extraversion even after controlling for all the investigated personality characteristics. This suggests that strong need for social interactions might be an independent risk factor for Facebook addiction (Tang et al., 2015).

Facebook addiction was positively related to narcissism but there was no relationship between Facebook addiction and self-esteem (H3 partially substantiated). Expressing ambitions and showing successes to a potentially large audience while obtaining highly visible rewards through “likes” and comments, may be a strong gratification for narcissists attracted to engaging in ego-enhancing activities (Andreassen et al., 2016; Wang, Jackson, Zhang, & Su, 2012). On the other hand, positive and negative feedback from other users as well as different motivations to use Facebook, can both enhance or lower self-esteem (Valkenburg, Peter, & Schouten, 2006). Furthermore, Facebook addiction was negatively related to self-efficacy. People with low self-efficacy, who do not believe in their own abilities to cope with wide range of situations, have limited strategies to cope with stress or social anxiety (Wegmann & Brand, 2016). They could get involved in activities on Facebook to escape from problems. This is one of the most important findings, as self-efficacy has been more or less neglected in the context of Facebook addiction, despite the fact that there is a well-established link between this trait and addiction in general (Marlatt et al., 1995) and well-being (Burger & Samuel, 2017). At the same time, self-efficacy is modifiable (Gist & Mitchell, 1992) which opens for possibilities of successful interventions.

### 4.3. Facebook addiction and social functioning

Both social anxiety and loneliness were positively related to Facebook addiction (H4 substantiated) which is congruent with previous studies (Błachnio et al., 2016; Dobrean & Păsărelu, 2016). It shows that although loneliness is one of the effects of social anxiety it might be as well an effect of another affliction and have unique contribution to Facebook addiction even after controlling the level of social anxiety. Thus, results show relative contribution of social anxiety and loneliness to Facebook addiction within a more complementary model of personality risk factors. These results are fundamental from the perspective of a well-established link between social support and health and well-being (Cohen & Wills, 1985), and suggest that a detailed analysis of the difficulties in the social life of a person addicted to Facebook may reveal areas for proper interventions. These may focus on social anxiety, but as the results indicate, they should not be limited just to this source of feelings of loneliness. The lack of social skills, low self-efficacy and ineffective coping strategies may be other potential sources of deficits in regarding experienced social support, and may as such constitute other relevant areas of intervention.

### 4.4. Facebook addiction and well-being

Facebook addiction was positively associated with perceived stress and negatively with general health and sleep quality above and beyond personality factors and social functioning (H5 partially substantiated). These results are congruent with previous studies (Hanprathet et al., 2015) and show that Facebook dependence may have detrimental effect on health. However, Facebook addiction was not related to quality of life (part of H5 not substantiated). Single item measure of quality of life might be excessively general and/or not sensitive enough to identify small differences in global quality of life. As a general indicator of psychosocial functioning quality of life may deteriorate at a relatively slow rate, and since study included young people, it may take time to observe overall decrease in their well-being due to Facebook addiction.

### 4.5. Strengths and limitations

To the authors' knowledge the current study is the first to investigate the relative contribution of a wide range of relevant personality characteristics to Facebook addiction, and the unique variance which this addiction explains in different facets of well-being above and beyond these personality characteristics. The present study comprised a relatively large sample size providing high statistical power and valid and reliable psychometric tools were included. Consequently, the study significantly adds to the existing literature on behavioral addictions, and provides further insights into the nature of Facebook addiction, and its relationship to health and psychological well-being. On the other hand, the study has some limitations that should be noted. All data were self-reported, which is in turn open to the usual weaknesses of such data (e.g., common method, social desirability and recall biases). Furthermore, as the Polish sample was not representative, this puts restrictions on the generalizability to other populations.

## 5. Conclusions and future research directions

Based on the findings in the present study it is concluded that Facebook addiction can be validly and reliably measured among university students in Poland. What is more, results provide some initial support for the general hypothesis that Facebook addiction might be a result of ineffective mood regulation by individuals who have a problematic social life. When suggested tentative personality risk factors model were investigated, addictive Facebook use was related to being female, being older, extraverted, narcissistic, having low sense of self-efficacy as well as feeling loneliness and social anxiety. In the light of these results, it seems that Facebook dependent individuals crave for social interactions, especially self-validation through these interactions. However, because underlying causes of distress are not confronted and dealt with, due to their low general self-efficacy, the increasingly compulsive Facebook activity may generate additional stress and in consequence may negatively affect their psychosocial functioning. In line with the addiction framework, Facebook addiction is related to higher stress, lower general health and lower sleep quality. Future research should attempt to collect and analyze further data on the psychometric properties of the Bergen Facebook Addiction Scale, including reasons for the correlated error terms between items. Due to the fact that the results of previous studies are not always coherent, future investigations on the impact of Big Five personality traits on the Facebook addiction should be conducted, as well as on the impact of self-efficacy and insufficient self-control on Facebook addiction. The role of motivation to use Facebook may provide useful information in terms of possible correlates of Facebook addiction. Furthermore, longitudinal studies using representative samples of young adults would aid the examination of potential developmental risk factors of Facebook addiction. The temporal stability of Facebook addiction should also be investigated.

## Declaration of interest

None.

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## Authors' contribution

PAA assisted with obtaining funding, literature search, study design and concept, data collection, statistical analyses, data interpretation, manuscript preparation and editing, and final editing; JB assisted with literature search, study design and concept, data collection, data interpretation, generation of the initial draft of the manuscript, manuscript preparation and editing, and final editing; PB assisted with literature search, study design and concept, data collection, statistical analyses, data interpretation, generation of the initial draft of the manuscript, manuscript preparation and editing, and final editing; AB assisted with literature search, study design and concept, data collection, data interpretation, generation of the initial draft of the manuscript, manuscript preparation and editing, and final editing; SP assisted with literature search, data interpretation, manuscript preparation and editing, and final editing; CSA assisted with literature search, data interpretation, manuscript preparation and editing, and final editing.

## Conflicts of interest

None.

## Ethics

The project was approved by the Research Ethics Committee at the Psychology Department of the University of Gdańsk. Attaining formal and written informed consent was not regarded as necessary as voluntary completion of the questionnaires was regarded as providing consent.

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**ARTYKUŁ 2**

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ORIGINAL ARTICLE

# *Relationship between dimensions of grandiose narcissism and Facebook addiction among university students*

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BACKGROUND
The present study aimed to examine the relationship between different dimensions of grandiose narcissism and Facebook addiction among undergraduate students. In the Polish population, grandiose narcissism has been shown to have a four-factor structure: Self-sufficiency, Vanity, Leadership and Admiration demand. Studies consistently show that grandiose narcissism is related to Facebook addiction. However, it is still not clear which dimensions of grandiose narcissism are particularly related to this addiction.

PARTICIPANTS AND PROCEDURE
The sample consisted of 486 students (313 women, 173 men). The mean age in the sample was $M = 21.56$ ($SD = 4.50$). Students were invited to participate anonymously in the study during lectures or classes. Part of the sample completed the questionnaire featured on Facebook. Valid and reliable psychometric tools were applied to assess grandiose narcissism, the Big Five personality traits and Facebook addiction.

RESULTS
The results showed that Facebook addiction was positively related to Admiration demand and negatively related to Self-sufficiency after controlling for age, gender, and the Big Five personality traits. However, there was no relationship between Vanity or Leadership and Facebook addiction above and beyond other study variables.

CONCLUSIONS
The results showed that a particular dimension of grandiose narcissism (i.e. passive and dependent on others) could be viewed as a risk factor of Facebook addiction. On the other hand, the active and independent dimension of grandiose narcissism could be viewed as a protective factor in the context of Facebook addiction.

KEY WORDS
Facebook addiction; SNS addiction; narcissism; grandiose narcissism; personality

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## BACKGROUND

It is estimated that in 2021 there will be approximately 3.02 billion users of social networking sites (SNSs) globally (Statistica, 2020). In the third quarter of 2019, Facebook had an average of 1.62 billion daily active users (Facebook, 2020). With the increasing popularity of SNSs such as Facebook, problems involving excessive use and potential negative consequences of this phenomenon have emerged. Previous empirical findings suggest that excessive or addictive use of SNSs could impair psychological and social well-being of an individual and their next of kin (Andreassen, 2015; Frost & Rickwood, 2017; Hussain & Griffiths, 2018).

According to uses and gratifications theory, the use of a particular medium is goal-directed and could be related to different forms of gratification as well as distinct needs underlying this use (Katz, Haas, & Gurevitch, 1973). Within the SNS users, there are various motivations of usage (Chen, 2011; Mull & Lee, 2014; Sheldon & Bryant, 2016; Throuvala, Griffiths, Rennoldson, & Kuss, 2019). According to Nadkarni and Hoffman (2012) using Facebook is determined by two motives: a need for self-presentation and a need for affiliation. What is more, studies show that relationship maintenance is the main reason for Facebook use (Kuss & Griffiths, 2011). Therefore, it is crucial to differentiate results from respective sites (e.g. Facebook), in order to understand which specific gratifications underlie the use of a particular SNS (Ryan, Chester, Reece, & Xenos, 2014).

Devolution from normal to problematic use of SNSs occurs when online social networking is perceived by the person as an essential mechanism to relieve stress, depression, and loneliness (Xu & Tan, 2012). Problematic SNS use has been conceptually defined as a disorder that does not involve ingestion of a psychoactive substance and shares qualities related to a behavioral addiction (Griffiths, 2005; Kuss & Griffiths, 2017). Other researchers have used the term SNS addiction and defined it as "being concerned about SNSs all the time, driven by a strong motivation to log on to or use SNSs, and to devote so much time and effort to SNSs that it impairs other social activities, studies/job, interpersonal relationships, and/or psychological health and well-being" (Andreassen & Pallesen, 2014, p. 4054). This definition could also refer to Facebook addiction as an example of SNS addiction (Atroszko et al., 2018).

Theoretical models of SNS addiction have emphasized the prominence of predisposing factors (i.e. personality) in the context of development and maintenance of this addiction (Andreassen, 2015; Andreassen et al., 2013; Atroszko et al., 2018; Balcerowska & Biernatowska, 2018; Brand, Young, Laier, Wölfling, & Potenza, 2016). Studies are often based on the Big Five model of personality emphasizing the following main dimensions: neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness (Wiggins, 1996). With reference to the Big Five, a meta-analysis showed that Facebook addiction was positively related to neuroticism and negatively to conscientiousness. What is more, there are weak negative relationships between extraversion, agreeableness, and openness to experience, on the one hand, and Facebook addiction, on the other (Marino, Gini, Vieno, & Spada, 2018).

In the context of SNS usage, the facilitating role of narcissism has been recognized in theory and supported by research findings (Barry & McDougall, 2018). People who scored higher on narcissism attached greater importance to Facebook, were more active on Facebook, and spent more time using it (Błachnio, Przepiórka, & Rudnicka, 2016). Facebook could be a place that promotes narcissistic tendencies by encouraging users to present themselves frequently and in the most positive ways (Gnambs & Appel, 2017). Studies conducted by Błachnio, Przepiórka, and Rudnicka (2016) showed that narcissism is a positive predictor of personal importance, instrumental Facebook use, social Facebook use, and Facebook intensity. Moreover, narcissists spend more time on SNSs, have a larger circle of contacts and they are particularly inclined to upload more photos compared to non-narcissists (Gnambs & Appel, 2017).

There are at least two different dimensions of narcissism (i.e., grandiose vs. vulnerable) that have been discussed using a variety of titles (e.g., Dickinson & Pincus, 2003; Miller & Campbell, 2008; Wink, 1991). The first one is characterized by grandiosity, self-importance, dominance, and uniqueness, while the second is related to interpersonal hypersensitivity, insecurity, and social withdrawal (Dickinson & Pincus, 2003; Miller et al., 2011). Studies consistently show that grandiose narcissism, as a personality trait, is a heterogeneous construct, with different, often contradictory, effects of its aspects (e.g. Ackerman et al., 2011; Back et al., 2013; Emmons, 1984; Raskin & Terry, 1988). On the basis of Emmons's model (1984), Polish researchers proposed a four-factor structure of grandiose narcissism including (1) Self-sufficiency, which involves confidence in one's abilities, (2) Vanity, which refers to the delight of self, (3) Leadership, connected with the conviction about one's impact on others as well as manipulation, and (4) Admiration demand, which reflects a desire to be admired and involves the sense of entitlement. Furthermore, Bazińska and Drat-Ruszczak (2000) proposed two second-order dimensions: (1) active–passive, related to engaging in action vs. being passive (Leadership and Self-sufficiency vs. Admiration demand and Vanity), and (2) dependence–independence from others in which the main regulator of self-esteem is self vs. the main self-regulatory strategy is comparing oneself to others (Vanity and Self-sufficiency vs. Leadership and Admiration demand).

In the presented model, all factors are related to self-esteem but two active dimensions (Leadership and Self-sufficiency) show stronger relations to self-esteem than passive ones (Admiration demand and Vanity). What is more, only Self-sufficiency is positively related to actual well-being, while Vanity and Admiration demand are positively related to anticipated well-being (i.e., an expectation of a high level of life satisfaction in the future). Furthermore, the only factor that is negatively related to neuroticism is Self-sufficiency (Bazińska & Drat-Ruszczak, 2000). Accordingly, every dimension of grandiose narcissism involves a different pattern of self-esteem regulation: for some narcissists, other people are necessary for their self-regulation, while other narcissists are self-sufficient. What is more, the associations are also differentiated in relation to the active-passive dimension, which results in diverse effects on well-being. Thus, for some narcissists, using Facebook might be highly gratifying, while for others, this type of activity might be neutral or even aversive. Therefore, different dimensions of grandiose narcissism might differ in the way they are related to Facebook addiction.

Studies constantly show that narcissism is positively related to SNS addiction (e.g. Andreassen, Pallesen, & Griffiths, 2017; Kircaburun, Demetrovics, & Tosuntaş, 2018). Furthermore, previous research confirmed that grandiose narcissists are at a higher risk of developing Facebook addiction (Atroszko et al., 2018; Błachnio & Przepiórka, 2018). However, previous investigations did not explain which dimensions of grandiose narcissism are particularly related to this addiction. Firstly, the nature of the relationship between Vanity and Facebook addiction, or between Leadership and Facebook addiction, is not clear. Secondly, the mechanism linking narcissism and Facebook addiction had been predominantly based on exhibitionistic narcissistic needs, desire to be admired, and self-promotion strategies on SNSs (Gnambs & Appel, 2017). Using Facebook might be highly gratifying especially for those narcissists that are passive and depend on others. In line with this, the strategy to confirm one's self-esteem through self-promotion and exhibitionistic tendencies could lead narcissists demanding admiration to Facebook addiction. Thirdly, those aspects of grandiose narcissism related to confidence, assertiveness, emotional stability, and independence from others could be viewed as protective factors in the context of developing and maintaining disorders (Bazińska & Drat-Ruszczak, 2000). Therefore, self-sufficient narcissists might be less prone to Facebook addiction. Last but not least, previous studies showed that Facebook addicts have problems with emotional regulation, are rather neurotic, and unconscientious (Marino et al., 2018). On the other hand, they are extravert and crave social interactions, especially self-validation through those interactions (Atroszko et al., 2018). In line with this multidimensional personality portrait of Facebook addicts, it is crucial to investigate the relative contribution of particular personality traits (i.e. the Big Five personality traits and narcissism) to this addiction.

Taking into account that personality traits are crucial risk factors in developing Facebook addiction (Andreassen et al., 2013; Brand et al., 2016), the aim of this study is to examine the relationship between this addiction and different dimensions of grandiose narcissism. Therefore, this research aimed to differentiate the effects of grandiose narcissism composites on Facebook addiction above and beyond demographic variables, and the Big Five personality traits. On the basis of previous research and theoretical frameworks, we hypothesize that: Admiration demand is positively related to Facebook addiction (H1); Self-sufficiency is negatively related to Facebook addiction (H2). What is more, we posed the following research questions: Is there a relationship between Leadership and Facebook addiction? (Q1); Is there a relationship between Vanity and Facebook addiction? (Q2).

## PARTICIPANTS AND PROCEDURE

### PARTICIPANTS

Initially, the sample comprised 580 people. Before the analyses, data were screened and two participants who did not have accounts on any SNSs were excluded. Due to missing data on relevant variables, 94 participants were further eliminated from the analyses. Finally, 486 respondents were found in the sample: 313 women (64.4%) and 173 men (35.6%). The mean age was $M$ = 21.56 ($SD$ = 4.50). According to declarative data, respondents used Facebook on average 2.81 hours ($SD$ = 2.51) a day and have had a Facebook account for 5.32 years ($SD$ = 1.63).

### MEASURES

*Facebook addiction.* The Bergen Facebook Addiction Scale (BFAS; Andreassen, Torsheim, Brunborg, & Pallesen, 2012) includes six items that are based on the addiction components model (Griffiths, 2005). Responses are provided on a 5-point Likert scale ranging from 1 (*very rarely*) to 5 (*very often*). The higher scores indicate greater Facebook addiction. The Polish version of the BFAS has shown good validity and reliability in previous studies (Atroszko et al., 2018; Charzyńska & Góźdź, 2014). In the present sample, the Cronbach's α reliability coefficient was .81.

*Grandiose narcissism.* The Narcissistic Personality Inventory (NPI; Bazińska & Drat-Ruszczak, 2000) was used to assess the grandiose narcissism. The inventory measures four factors of grandiose narcissism: Leadership (11 items), Vanity (5 items), Self-sufficiency

(7 items), and Admiration Demand (11 items). Respondents provided answers on a five-point Likert scale, from 1 (*it's not me*) to 5 (*it's me*). It showed adequate validity and reliability, as well as good psychometric properties in previous studies (Bazińska & Drat-Ruszczak, 2000). In this study, Cronbach's α coefficients were .88 for Leadership, .74 for Vanity, .76 for Self-sufficiency and .88 for Admiration Demand.

*Personality*. The Polish version (Atroszko, 2015) of the Ten Item Personality Inventory (TIPI; Gosling, Rentfrow, & Swann, 2003) was used to assess the Big Five model of personality: Extraversion, Agreeableness, Conscientiousness, Emotional stability, and Openness to experience. Respondents provided answers on a 7-point Likert scale, ranging from 1 (*disagree strongly*) to 7 (*agree strongly*). The TIPI has shown good validity and reliability in previous studies (Atroszko, 2015; Atroszko, Andreassen, Griffiths, & Pallesen, 2016a, 2016b; Atroszko et al., 2018). In the presented sample, the Spearman-Brown reliability coefficient was .66 for Extraversion, .43 for Agreeableness, .67 for Conscientiousness, .68 for Neuroticism and .30 for Openness to experience. The TIPI demonstrates good validity and biased estimates of reliability using internal consistency measures, which should be expected due to the small number (just two) of items per dimension (Gosling et al., 2003). Therefore, less biased measures of reliability should be used, such as the test-retest reliability, which for the original scale yielded acceptable correlations between repeated measurements within a 6-week interval, varying from .62 for Openness to .77 for Extraversion (Gosling et al., 2003).

### PROCEDURE

Data collection used convenience sampling. Students were invited to participate anonymously in the study during lectures or classes; all of them agreed to do so. The estimated response rate was above 95%. Part of the sample (38.9%) collection was conducted via a questionnaire placed on Facebook. Respondents were asked to follow a hyperlink to access the survey. The response rate for online surveys is impossible to determine (Fan & Yan, 2010). Before starting to respond, the participants received detailed information about the study. Data collection took place from January 2016 to April 2016. Participation in the study was anonymous and no monetary or other material rewards were offered.

### STATISTICAL ANALYSIS

Means, standard deviations and correlation coefficients between study variables were calculated. Multiple hierarchical regression analysis was conducted in which Facebook addiction was the dependent variable. This model allowed us to analyze whether dimensions of grandiose narcissism are significant predictors of Facebook addiction after controlling for demographic variables and the Big Five personality traits. Additionally, multiple hierarchical regression was used in order to investigate which particular dimension of grandiose narcissism is the more appropriate predictor for the dependent variable (i.e. Facebook addiction). In the first step, gender and age were entered. Independent variables entered in the second step were the Big Five personality traits (Neuroticism, Extraversion, Openness to experience, Agreeableness, Conscientiousness). In the third step, four dimensions of narcissism were entered. Additionally, the lower and upper 95% confidence intervals were calculated to compare the beta weights. All tests were two-tailed and the significance level was set to $\alpha = .05$. Preliminary analyses showed that the regression assumptions about normality, linearity, homoscedasticity and multicollinearity ($VIF_{max} = 2.59$) were met. Standardized regression coefficients were reported. All statistical analyses were conducted in IBM SPSS 25.

### ETHICS

The study was carried out in accordance with the Declaration of Helsinki. All gathered data were anonymous, and participants were informed of all the relevant details about the study and their role in it, including the ability to leave the study at any point. Obtaining formal and written informed consent was not regarded as necessary as voluntary completion of the questionnaires was regarded as providing consent, the study was anonymous and no medical information was gathered.

## RESULTS

Mean scores, standard deviations, percentages and correlation coefficients of the study variables are presented in Table 1. Correlation analysis showed some significant relationships between Facebook addiction and studied variables. Facebook addiction was negatively associated with male gender ($r = -.23$, $p < .001$), Conscientiousness ($r = -.13$, $p < .001$) and Self-sufficiency ($r = -.11$, $p = .020$). Positive correlations with Facebook addiction have been reported with Neuroticism ($r = .18$, $p < .001$), Admiration demand ($r = .31$, $p < .001$) and Vanity ($r = .17$, $p < .001$).

The regression analysis showed that the independent variables added in step 1 explained 5.8% of variance of Facebook addiction ($F(2, 483) = 14.74$, $p < .001$). Gender ($\beta = -.24$, $p < .001$) and age ($\beta = -.07$, $p = .048$) had significant effects on Facebook addiction in step 1. Independent variables added in step 2

Table 1

*Mean scores, standard deviations, percentages, and correlation coefficients between age, gender, declarative time spent on Facebook, Big Five personality traits, grandiose narcissism, and Facebook addiction*

| | *M* (*SD*)/% | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Age | 21.56 (4.50) | | | | | | | | | | | | |
| 2. Gender[a] | 35.6% men | −.11** | | | | | | | | | | | |
| 3. Facebook addiction | 12.88 (4.93) | −.05 | −.23** | | | | | | | | | | |
| 4. Extraversion | 9.94 (2.91) | .04 | .06 | .02 | | | | | | | | | |
| 5. Neuroticism | 8.17 (3.22) | −.03 | −.26** | .18** | −.41** | | | | | | | | |
| 6. Agreeableness | 9.87 (2.50) | .05 | −.07 | −.02 | .11* | −.11* | | | | | | | |
| 7. Conscientiousness | 9.94 (2.99) | .03 | .01 | −.13** | .11* | −.18** | .16** | | | | | | |
| 8. Openness to experience | 9.79 (2.15) | .05 | −.06 | −.05 | .32** | −.02 | .01 | .00 | | | | | |
| 9. Admiration demand | 29.59 (8.82) | −.05 | .09 | .31** | .27** | −.01 | −.16** | −.11* | .11* | | | | |
| 10. Leadership | 31.78 (8.80) | .06 | .13** | .10* | .39** | −.20** | −.13** | .00 | .25** | .66** | | | |
| 11. Vanity | 14.00 (4.29) | −.04 | .08 | .17** | .20** | −.09 | −.05 | −.06 | .17** | .60** | .50** | | |
| 12. Self-sufficiency | 23.68 (4.43) | .01 | .15** | −.11* | .36** | −.35** | −.04 | .18** | .26** | .37** | .60** | .37** | |
| 13. Declarative time spent on Facebook | 2.81 (2.51) | −.15** | −.04 | .44** | .01 | .10* | .00 | −.13** | −.05 | .22** | .07 | .14** | −.03 |

*Note.* Declarative time spent on Facebook has been given in hours; a point-biserial correlation coefficient, 0 – women, 1 – men; *$p < .05$, **$p < .01$.

explained additional 4.4% of variance ($F(5, 478) = 4.64$, $p < .001$). Gender (β = −.21, $p < .001$), Extraversion (β = .15, $p = .004$), Conscientiousness (β = −.11, $p = .013$), Neuroticism (β = .16, $p = .002$) and Openness to experience (β = −.10, $p = .025$) showed significant effects on Facebook addiction in Step 2. Independent variables added in step 3 explained an additional 11.5% of variance ($F(4, 474) = 17.42$ $p < .001$). After adding the dimensions of narcissism to the regression model in step 3, the effects of the Big Five personality traits ceased to be significant. Gender (β = −.23, $p < .001$), Admiration demand (β = .37, $p < .001$), and Self-sufficiency (β = −.18, $p = .001$) showed significant effects on Facebook addiction in Step 3. In total, the model explained 21.6% of Facebook addiction's variance (gender, Admiration demand, Self-sufficiency; $F(11, 474) = 11.90$, $p < .001$) (see Table 2).

## DISCUSSION

The aim of the study was to investigate the relationships between different dimensions of grandiose narcissism and Facebook addiction among university students. To the best of the authors' knowledge, there are no studies examining the relative contribution of different aspects of grandiose narcissism to Facebook addiction above and beyond age, gender and Big Five personality traits.

There was a negative relationship between age and Facebook addiction before including the Big Five personality traits in the tested model, which is congruent with previous studies (e.g. Andreassen et al., 2016; Błachnio, Przepiórka, & Pantic, 2015). SNSs might meet young people's needs, especially those related to establishing and maintaining relationships

Table 2

*Results of hierarchical multiple regression analyses in which age, gender, Big Five personality traits and grandiose narcissism were regressed upon results of Facebook addiction (standardized regression coefficients, lower and upper 95% confidence intervals are reported)*

| Step | Predictor | Facebook addiction | | | |
|---|---|---|---|---|---|
| | | β | LCI | UCI | $\Delta R^2$ |
| 1 | Age | −.07* | −.15 | .01 | .06** |
| | Gender[a] | −.24** | −.33 | −.15 | |
| 2 | Age | −.06 | −.13 | .02 | .04** |
| | Gender[a] | −.21** | −.31 | −.12 | |
| | Extraversion | .15* | .05 | .26 | |
| | Agreeableness | −.01 | −.11 | .09 | |
| | Conscientiousness | −.11* | −.20 | −.03 | |
| | Neuroticism | .16** | .06 | .26 | |
| | Openness to experience | −.10* | −.21 | .00 | |
| 3 | Age | −.05 | −.11 | .03 | .12** |
| | Gender[a] | −.23** | −.32 | −.14 | |
| | Extraversion | .05 | −.05 | .17 | |
| | Agreeableness | .03 | −.08 | .12 | |
| | Conscientiousness | −.05 | −.14 | .04 | |
| | Neuroticism | .07 | −.03 | .17 | |
| | Openness to experience | −.08 | −.18 | .01 | |
| | Admiration demand | .37** | .24 | .50 | |
| | Leadership | −.02 | −.14 | .11 | |
| | Vanity | .05 | −.05 | .15 | |
| | Self-sufficiency | −.18** | −.29 | −.07 | |
| | Total $R^2$ | | | | .22** |

*Note.* [a]0 – women, 1 – men; *$p < .05$, **$p < .01$.

with others (Riva, Wiederhold, & Cipresso, 2016). Therefore, using Facebook could be highly gratifying, or even addictive, for young people (Andreassen et al., 2016).

Furthermore, there was a positive relationship between Facebook addiction and female gender, even after controlling for all the investigated variables in the tested model (i.e. age, the Big Five personality traits and dimensions of the grandiose narcissism). This suggests that being female might be an independent risk factor for Facebook addiction. The results are consistent with previous studies indicating that women are at higher risk of developing Facebook addiction than men (Andreassen et al., 2012; Atroszko et al., 2018).

The prominence of personality as a risk factor in development and maintenance of SNS addiction has been emphasized in theoretical models and previous investigations (e.g. Andreassen, 2015; Andreassen et al., 2013; Brand et al., 2016). With reference to the above-mentioned models, there were positive relationships between neuroticism, extraversion, and Facebook addiction, as well as negative relationships between openness to experience, conscientiousness, and Facebook addiction, before including grandiose narcissism dimensions in the tested model. This result is congruent with a previous meta-analysis on problematic Facebook use and personality (Marino et al., 2018). Nonetheless, after controlling for grandiose narcissism dimensions there was no relationship between Facebook addiction and the Big Five personality traits. This is in line with the hypothesis that SNS use might function as an opportunity to display grandiosity (Barry & McDougall, 2018). Moreover, narcissistic individuals receive self-enhancing positive feedback from other users, which could be a strong gratification for them (McCain & Campbell, 2018). Accordingly, even if the Big Five personality traits play a significant role in the context of Facebook addiction, there might be more crucial and specific personality risk factors which are more accurate referring to the specific personality portrait of Facebook addicts.

In the context of the unique contribution of particular dimensions of grandiose narcissism, the results showed that Admiration demand has an effect on Facebook addiction over and above age, gender, and the Big Five personality traits. Admiration demand reflects the need to be a prominent person, who is noticeable, admired by others and famous (Bazińska & Drat-Ruszczak, 2000). What is more, demanding admiration is related to the sense of entitlement, so when narcissistic needs are not fulfilled, one can fall into narcissistic rage related to aggressive and hostile responses of narcissists when facing an ego-threatening situation (Bushman & Baumeister, 1998; Twenge & Campbell, 2003). Grandiose narcissists seek approval from the external environment, which may in turn lead to difficulties in emotional regulation (Given-Wilson, Mcllwain, & Warburton, 2011). What is more, narcissistic individuals experience greater anger and anxiety, as well as lower self-esteem, after receiving negative feedback about their performance (Morf & Rhodewalt, 2001). Thus, although grandiose narcissists report themselves as free of psychological distress, they engage in deliberate acts to protect this appearance and have difficulties in regulating self-esteem and emotions in this process (Akinci, 2015). Regulating self-esteem by using Facebook could provide strong gratification for narcissists, who need others to confirm their self-worth. Furthermore, Facebook is a place that provides an opportunity to strictly control one's own image by adding only positive and self-promoting information (Barry, Doucette, Loflin, Rivera-Hudson, & Herrington, 2015). Thus, it is presumed that positive feedback from other users decreases stress and improves mood by enhancing self-esteem. In line with this, expressing ambitions and displaying success to a potentially large audience may be a strong gratification for narcissists demanding admiration (Andreassen et al., 2017).

There was no relationship between Leadership and Facebook addiction. Leadership refers to a belief that one has high abilities to control other people and have an influence on them (Bazińska & Drat-Ruszczak, 2000). According to the results, narcissists dependent on others will use Facebook features as a tool for self-regulation only by the creation of an environment where they can be admired, and not by having an impact on other users, who serve merely as an audience (Andreassen et al., 2017). In the proposed structure of grandiose narcissism, Leadership contains a belief of influencing others, while Admiration demand is related to the assumption that admiration from others does not have to be contingent on one's own merits (Bazińska & Drat-Ruszczak, 2000). In line with this, Leadership could be viewed as a personality predictor of high and intensive Facebook use (e.g. influencers), but not Facebook addiction.

Self-sufficiency has an effect on Facebook addiction over and above age, gender, and the Big Five personality traits. It might be explained by the fact that self-sufficient narcissists regulate their self-esteem by self, rather than other people. Thus, these narcissists do not need other people to preserve their high self-esteem (Bazińska & Drat-Ruszczak, 2000). Therefore, social reinforcement that they might receive on Facebook is not as gratifying for them as for other narcissists (Biernatowska, Balcerowska, & Pianka, 2017). Additionally, because Self-sufficiency is defined as beliefs in one's individualism, independence, high competencies, and success, being dependent on others' approval is opposite to the narcissist's own image. Narcissistic self-sufficiency is related to well-

being which is also correlated with lower susceptibility to addictions (Caplan, 2002). Accordingly, the results suggest that the higher level of Self-sufficiency, the lower probability of Facebook addiction.

In the investigated model, Vanity was not uniquely Facebook addiction. Vanity is a dimension of grandiose narcissism that is passive and independent from others. Furthermore, this dimension is characterized by self-admiration (Bazińska & Drat-Ruszczak, 2000). Therefore, there is no need for other people's appreciation to regulate self-esteem and mood for these narcissists. A previous study showed that using Facebook is related to maintaining social interactions and companionship (Kuss & Griffiths, 2011); hence vain narcissists who do not need social reinforcement do not engage in excessive Facebook use.

The present study significantly adds to the existing literature on Facebook addiction and provides valuable insights into the nature of the risk and protective factors of this addiction. In terms of limitations, all data were self-reported and cross-sectional design was used, rendering the data vulnerable to limitations associated with such data (e.g., common method, social desirability and recall biases). The sample was not representative of the general population of Facebook users and comprised students, which puts restrictions on the generalizability to other populations.

Future studies should further investigate the nature of the relationship between Facebook addiction and grandiose narcissism. Further studies should also examine the regulating role of self-esteem in the relationship between particular dimensions of grandiose narcissism and SNS addiction. Moreover, cross-cultural studies, as well as studies based on the diverse theories of grandiose narcissism, should be conducted. Future research should also attempt to collect and analyze data on demographic variables, especially gender, along with specific SNS usage patterns and SNS addiction. Last but not least, the potential role of motives of using SNSs in the context of different dimensions of grandiose narcissism should be further studied.

## CONCLUSIONS

The present study suggests that in the context of Facebook addiction grandiose narcissism is an important factor that could lead to Facebook addiction. Moreover, grandiose narcissism as a personality trait seems to be a stronger predictor of Facebook addiction than the Big Five personality traits. In conclusion, this study shows that it is not general narcissism itself that is related to Facebook addiction, but it probably is the particular dimension of grandiose narcissism (passive and dependent on others). On the other hand, Self-sufficiency as the most independent aspect of grandiose narcissism related to strong belief about one's self-efficacy is negatively related to Facebook addiction. This result suggests that this particular dimension of grandiose narcissism functions as a protective factor in the context of Facebook addiction. The results of the study may be helpful in designing prevention programs which might concentrate on strengthening the self-sufficiency in the group of individuals susceptible to Facebook addiction. Furthermore, narcissism should be taken into account in addiction therapy programs, despite the fact that not all aspects of this trait might contribute to Facebook addiction.

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**ARTYKUŁ 3**

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# Is it meaningful to distinguish between Facebook addiction and social networking sites addiction? Psychometric analysis of Facebook addiction and social networking sites addiction scales

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## Abstract

Studies conducted on Social Networking Sites (SNSs) addiction have to a large extent focused on Facebook as a prototypical example of SNS. Nonetheless, the evolution of SNSs has spawn conceptual and methodological controversies in terms of the operationalization of SNS addiction. In order to bring more clarity to this field the present study aimed to investigate the construct validity of the Bergen Social Media Addiction Scale (BSMAS) in comparison to the Bergen Facebook Addiction Scale (BFAS) among 1099 young subjects (146 Facebook-only users and 953 who had an account on Facebook and at least one additional SNS). Furthermore, the study aimed to investigate the unique contribution of SNS addiction to stress and general well-being above and beyond personality characteristic and Facebook addiction specifically. Participants completed a survey assessing SNS addiction, Facebook addiction, demography, Big Five personality traits, perceived stress, and general subjective well-being. BSMAS had acceptable fit with the data and demonstrated good reliability. Results showed that the scores of BSMAS were strongly associated with those of BFAS and that the relationship between the two measures was stronger in the group of Facebook-only users than in the group of multisite-social networkers. Moreover, SNS addiction was positively associated with perceived stress and negatively associated with subjective well-being after controlling for Facebook addiction and other study variables. Theoretical and methodological implications of the findings are discussed.

**Keywords** SNS addiction · Facebook addiction · Scale · Personality · Well-being · Stress

## Introduction

Social Networking Sites (SNSs) are "virtual communities where users can create individual public profiles, interact with real-life friends, and meet other people based on shared interests" (Kuss and Griffiths 2011 p. 3529). Social networking is currently one of the most popular forms of communication and entertainment among Internet users (GlobalWebIndex 2018). It is estimated, that in 2021, there will be approximately 3 billion SNSs users globally (Statista 2019). However, there is growing scientific evidence suggesting that excessive use of social networking sites may result in symptoms traditionally associated

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with substance-related addictions (Andreassen 2015; Grant et al. 2010; Griffiths et al. 2014; He et al. 2017).

## SNS Addiction as an Example of Behavioral Addiction

SNS addiction is by some scholars regarded as a behavioral addiction, emerging from the framework, theoretical work and research on Internet addiction (Andreassen et al. 2016; Kuss and Griffiths 2011; Montag et al. 2014; Müller et al. 2016; van Rooij et al. 2017; Young 2009). It has been defined as "being overly concerned about SNSs, driven by a strong motivation to log on to or use SNSs, and to devote so much time and effort to SNSs that it impairs other social activities, studies/job, interpersonal relationships, and/or psychological health and well-being" (Andreassen and Pallesen 2014 p. 4054). According to the components model of addictions (Griffiths 2005), the symptoms of SNS addiction include salience, mood modification, tolerance, withdrawal, relapse, and conflict. Previous empirical findings suggest that SNS addiction may be a serious mental health problem with negative consequences for the psychosocial functioning of the sufferer and next of kin (see Andreassen 2015). Although there has been a rise in the number of studies on SNSs use and abuse, the status of SNS addiction is still to be formally acknowledged.

## Conceptual and Methodological Perspectives on SNS Addiction

In the fourth quarter of 2018, Facebook had involved on average 1.52 billion daily active users (Facebook 2019). As one of the biggest social networking websites, Facebook has become almost synonymous with social networking (Griffiths 2012). Studies conducted on SNS addiction have so far mainly focused on Facebook addiction, as Facebook was one of the first SNS established and has since been regarded as a prototypical example of SNS (see Marino et al. 2018a; Ryan et al. 2014). However, with the variety of apps and services that SNSs users have at their disposal today, social networking has become eclectic (Kuss and Griffiths 2017). Internet users can decide to maintain accounts across a wide range of platforms (e.g. Instagram, Snapchat, Twitter, Pinterest). In 2016 the average Internet user had accounts on almost eight different social websites (GlobalWebIndex 2017). Among those who have account on Facebook only, SNS addiction and Facebook addiction should be regarded as equivalent. On the other hand, SNS addiction and Facebook addiction does not necessarily reflect the same phenomenon among multisite-social networkers. Accordingly, SNS addiction and Facebook addiction should be viewed as similar but separate entities among multisite-social networkers (Kuss and Griffiths 2017).

Based on SNS addiction theory and empirical findings, the dynamic evolution of social networking sites has spawn controversies from both conceptual and methodological perspectives (see Andreassen and Pallesen 2013; Griffiths 2012). According to uses and gratifications theory, the use of a particular media is goal-directed and could be related to different forms of gratification as well as distinct needs underlying this use (Katz et al. 1973). From this perspective it seems crucial to take results from studies about specific sites into account in order to understand the development of SNS addiction (Ryan et al. 2014). In line with this, studies have now focused on addiction to specific platforms, for example Instagram (Kircaburun and Griffiths 2018), Twitter (Ndasauka et al. 2016) and Snapchat (Punyanunt-Carter et al. 2017). Contrarily, some scholars still suggest that SNS addiction should be framed as a behavior detached of a particular SNS platform and that addictions to specific sites are only examples of SNS addiction (Griffiths et al. 2014; Kuss and Griffiths 2017). According to the latter approach, SNS addiction is viewed as a generic phenomenon (e.g. Tang and Koh 2017; Wang et al. 2018). In line with such understanding, impairment associated with Facebook addiction (related for example to higher stress and lower well-being) should also be present in SNS addiction generally. Another theoretical viewpoint concerns which aspects of a particular site (e.g. Facebook) or SNS in general, are in fact addictive and cause mental problems (Andreassen and Pallesen 2013, 2014).

## Bergen Social Media Addiction Scale and Bergen Facebook Addiction Scale

Along with the discussion about the nature of the phenomenon of SNS addiction, research efforts have been taken with the aim of developing scales to measure addiction to specific sites (e.g. Facebook Intrusion Questionnaire; Elphinston and Noller 2011; Facebook Dependence Questionaire; Wolniczak et al. 2013) as well as SNS addiction in general (e.g. Addictive Tendences Towards SNSs; Wu et al. 2013; Social Networking Website Addiction Scale; Turel and Serenko 2012). The Bergen Facebook Addiction Scale (BFAS; Andreassen et al. 2012) was constructed based on general addiction theory, and measures Facebook addiction according to six basic addiction symptoms (i.e. salience, conflict, mood modification, withdrawal, tolerance, and relapse; Griffiths 2005). The BFAS has been adapted into several languages and has overall demonstrated good psychometric properties (e.g. Atroszko et al. 2018; Phanasathit et al. 2015; Wang et al. 2015). Nonetheless, a limitation of the scale is that is assesses addiction to one specific platform (i.e. Facebook) only. In order to overcome this limitation, the Bergen Social Media Addiction

Scale (BSMAS; Andreassen et al. 2016) was developed and represents a modified version of the BFAS replacing "Facebook" with "social networking sites", the latter being defined as "*Facebook*, *Twitter*, *Instagram* and the like" in the instructions. While the names "Bergen Social Media Addiction Scale" and "Bergen Social Networking Addiction Scale" are used interchangeably in the literature (Andreassen et al. 2017; Andreassen et al. 2017), we use in the following "social networking sites" as social media and social networking sites reflect similar but yet distinct phenomena (see Kuss and Griffiths 2017). The psychometric robustness of the BSMAS has been examined in Italian (Monacis et al. 2017), Hungarian (Bányai et al. 2017), Persian (Lin et al. 2017), and Chinese (Leung et al. 2020; Chen et al. 2020) samples, where it has showed good properties. Although previous studies have used a variety of methods to examine this scale, there is currently no study that has investigated the psychometric properties of the BSMAS in comparison to the BFAS. What is more, there is currently no empirical study that has investigated the relationship between a specific and a generic SNS addiction scale.

## SNS Addiction, Personality and Well-Being

Theoretical models of problematic Internet use and SNS addiction have emphasized the prominence of predisposing factors (Andreassen 2015; Atroszko et al. 2018; Brand et al. 2014; Caplan 2010; Davis 2001; Pelling and White 2009). Studies on SNS addiction have in this realm emphasized the role of certain personality traits predicting both use and abuse of SNS (Andreassen et al. 2013). With reference to the Big Five (Extraversion - being outgoing, talkative; Agreeableness - being sympathetic and warm; Conscientiousness - being organized and prompt, Neuroticism - being nervous and moody; Openness/Intellect- being creative and intellectually oriented) model of personality (Wiggins 1996) general SNS addiction and Facebook addiction have quite consistently been positively related to neuroticism (De Cock et al. 2014; Marino et al. 2018a) and negatively to conscientiousness (Błachnio et al. 2017; De Cock et al. 2014; Marino et al. 2018a). What is more, a meta-analysis showed a weak negative relationship between extraversion, agreeableness and openness to experience and Facebook addiction (Marino et al. 2018a). In terms of mental health both Facebook addiction and more general SNS addiction have been found to be associated with low well-being and psychological distress (Atroszko et al. 2018; Hou et al. 2017; Marino et al. 2018b; Pontes 2017). Hormes et al. (2014) reported that Facebook addiction is related to emotional regulation deficits and susceptibility to both substance and non-substance addiction. Addictive use of WeChat has been found to be negatively associated with users' physical, mental and social health beyond personality traits and demographic variables (Xue et al. 2018). Previous studies have also suggest that both typical and excessive SNS users experience reduction in perceived stress and improvement in well-being following SNS abstinence of several days. Furthermore, the positive effects were more substantial in the excessive SNS user group than among typical SNS users (Tromholt 2016; Turel et al. 2018). These findings suggest that both general and specific SNS-addiction seems to have parallel relationships with well-being and mental health. However, in the context of the constantly changing nature of SNSs, it is crucial to investigate the relative contribution of those phenomena in terms of well-being and mental health among different SNSs users. Taking into account that SNS addiction as a generic form of addiction might cumulate addictive properties from different SNSs it should also impair the well-being above and beyond addiction of (e.g. Facebook) specific sites.

## Aims of the Present Study

In the light of abovementioned theoretical and methodological discussion about SNS addiction, the aim of the present study was to investigate the validity and reliability of the BSMAS among social networking sites users. Among Facebook-only users and multisite-social networkers, SNS addiction and Facebook addiction do not necessarily reflect the same phenomenon. The present study aimed accordingly to compare the strength of the relationship between Facebook addiction and SNS addiction among Facebook-only users and multisite-social networkers, respectively. Previously, no study has investigated the psychometric properties of the BSMAS in comparison to the BFAS. Therefore, the present study is the first to compare the psychometric properties of the BSMAS in comparison to the BFAS in a sample of different SNSs users. In line with this, the present study is the first where a specific and a generic SNS addiction scale are compared. Previous empirical findings suggest that SNS addiction is related to specific personality risk factors and impairment of well-being and mental health. Accordingly, the aim of the present study was to examine the relationships between SNS addiction, personality traits, perceived stress and general subjective well-being. Last but not least, SNS addiction as a generic form might reflect addictive behavior in relation to several SNSs and is therefore expected to impair well-being and increase stress above and beyond addiction of (e.g. Facebook) specific sites. Consequently, the study aimed to identify the unique contribution of SNS addiction to stress and well-being beyond personality characteristics and Facebook addiction among multisite-social networkers.

## Hypotheses

On the basis of previous research and theoretical frameworks, it was hypothesized that (i) the Bergen Social Media Addiction Scale has good validity and reliability,

and a single factor solution in a Polish sample (H1); (ii) the scores of the BSMAS and the BFMAS will correlate highly, although the relationship between the scores will be stronger in the group of Facebook-only users than in a group of multisite-social networkers (H2); (iii) emotional stability and conscientiousness are inversely related to SNS addiction (H3); (iv) SNS addiction is positively related to stress and inversely related to well-being (H4); (v) the relationships between Facebook addiction and criterion variables (gender, age, personality, stress and well-being) are the same as the relationships between SNS addiction and criterion variables in group of multisite-social networkers (H5); (vi) SNS addiction explains significantly proportions of variances in stress and well-being above and beyond age, gender, personality traits and Facebook addiction among multisite-social networkers (H6).

## Methods

### Sample

Initially, the sample comprised 1183 respondents. Before the analyses, data was screened and data from three participants who did not have accounts on any social networking sites were excluded. Due to missing data on relevant variables, 81 participants were further eliminated from the analyses. Thus, the final sample comprised 1099 participants. The sample was divided into two groups based on the number of accounts on social networks. Figure 1 presents the distribution of the number of accounts on social networking sites. There were 146 (13.3%) subjects who only had Facebook account (Facebook-only users) whereas 953 (86.7%) had accounts on Facebook and at least one additional SNS (multisite-social networkers). Multisite-social networker individuals reported using an average of 3.51 different SNS ($SD = 1.30$). In addition to Facebook, 738 (77.4%) of them had an Instagram account and 697 (73.1%) had a Snapchat account. The sample was diverse in terms of sociodemographic features (see Table 1).

### Instruments

**Social Networking Sites Addiction** The Bergen Social Media Addiction Scale (BSMAS) is a modified version of the Bergen Facebook Addiction Scale (Andreassen et al. 2012). The modification involves replacing the word "Facebook" with "social networking sites" the latter being defined as "Facebook, Twitter, Instagram and the like" in the instructions to participants (Andreassen et al. 2016). The Polish version of the scale was administered. The responses are provided on a 5-point Likert scale ranging from *very rarely* (1) to *very often* (5). The BSMAS has shown good validity and reliability in previous research (Andreassen et al. 2016; Andreassen et al. 2017; Bányai et al. 2017; Lin et al. 2017; Monacis et al. 2017). The scale has shown measurement invariance across two Chinese cultural areas (Leung et al. 2020), as well as time invariance (Chen et al. 2020). In the present study the Cronbach's alpha reliability coefficient was .77. The Appendix provides a full list of the items in the Polish and English versions of the scale, respectively.

**Facebook Addiction** The Bergen Facebook Addiction Scale (BFAS; Andreassen et al. 2012) includes six items that are based on the addiction components model (Griffiths 2005). Responses are provided on a 5-point Likert scale ranging from *very rarely* (1) to *very often* (5). The Polish version of the BFAS has shown good validity and reliability in previous studies (Atroszko et al. 2018; Charzyńska and Góźdź 2014). The scale has also shown good psychometric properties when adapted into other languages (Phanasathit et al. 2015; Pontes et al. 2016; Silva et al. 2018; Wang et al. 2015). In the present study the Cronbach's alpha reliability coefficient of the BFAS was .81.

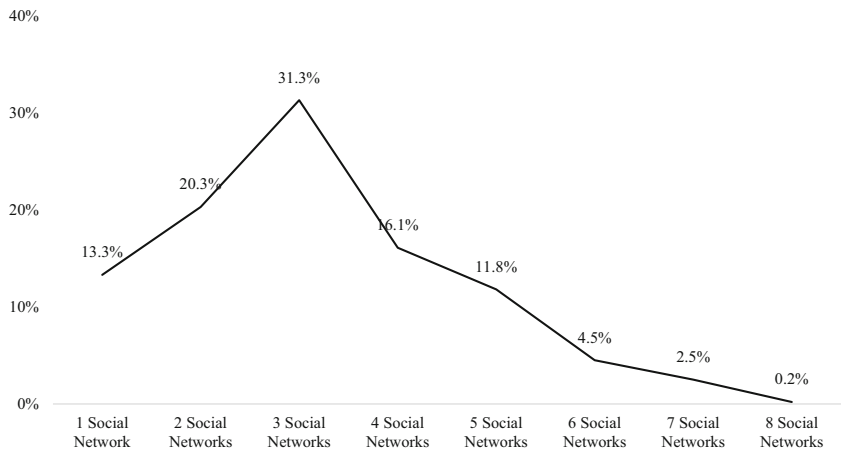


**Fig. 1** Percentage distribution of the number of accounts on social networking sites

**Table 1** Descriptive statistics of sociodemographic features in the sample

| | Total | | Facebook-only users | | Multisite-social networkers | |
|---|---|---|---|---|---|---|
| | Frequencies (*f*) | Percentages/ Mean (SD) | Frequencies (*f*) | Percentages/ Mean (SD) | Frequencies (*f*) | Percentages/ Mean (SD) |
| Females | 790 | 71.9% | 83 | 56.8% | 707 | 74.2% |
| Males | 309 | 28.1% | 63 | 43.2% | 246 | 25.8% |
| Age | | 21.44 (2.85) | | 21.25 (2.41) | | 22.69 (4.64) |
| Studying | 1037 | 94.4% | 136 | 93.2% | 901 | 94.5% |
| Working students | 364 | 35.1% | 48 | 32.9% | 316 | 33.2% |
| Working | 51 | 4.6% | 9 | 6.2% | 42 | 4.4% |
| Unemployed | 11 | 1.0% | 1 | 0.07% | 10 | 1.0% |

**Personality** The Polish version (Atroszko 2015) of Ten Item Personality Inventory (TIPI; Gosling et al. 2003) was used to assess the five-factor model of personality: Extraversion, Agreeableness, Conscientiousness, Emotional stability, and Openness to experience. Respondents provided answers on a 7-point Likert scale, ranging from *disagree strongly* (1) to *agree strongly* (7). The TIPI has shown good validity and reliability in previous studies (Atroszko 2015; Atroszko et al. 2016a, 2016b; Atroszko et al. 2018). In the present study the Spearman-Brown reliability coefficient was of .74 for Extraversion, .29 for Agreeableness, .72 for Conscientiousness, .62 for Emotional stability and .35 for Openness, respectively. The TIPI demonstrates good validity, still biased estimates of reliability using internal consistency measures which is expected due to the small number (just two) of items per dimension (Gosling et al. 2003). Therefore, less biased measures of reliability should be used, such as the test-retest reliability, which for the original scale yielded acceptable correlations between repeated measurements with 6-week interval, varying from .62 for Openness to .77 for Extroversion (Gosling et al. 2003).

**Stress** Perceived stress was measured by the Polish short version of Perceived Stress Scale (PSS-4; Cohen et al. 1983). It consists of four items with a 5-point Likert response format scale, ranging from *never* (1) to *very often* (5). The scale has shown good validity and reliability in previous research (Atroszko 2015; Atroszko et al. 2015; Atroszko et al. 2018). The Cronbach's alpha reliability coefficient was .75 in the present study.

**Subjective Well-Being** The Polish version of the Ultra-Short Protocol for Measuring Subjective Well-Being (USP-SWB) was used to assess general subjective well-being. It consists of six items based on the WHOQOL-BREF (Skevington et al. 2004). The scale covers three (out of four) main domains distinguished by the WHO: physical (general health, sleep quality), psychological (satisfaction with life, meaning in life) and social (satisfaction with personal relationship, satisfaction with support received from friends). The responses are provided on a 9-point Likert scale ranging from (1) *not at all* to (9) *an extreme amount* in case of items regarding satisfaction with life and meaning in life. The response alternatives for the other items range from (1*) very dissatisfied* to (9) *very satisfied.* The scale has shown good validity and reliability in previous research (Atroszko et al. 2019). As this is a fairly new measure and since papers describing its psychometric properties have not been published yet, we decided to report the results of its structure using confirmatory factor analysis: The model with three first-order factors (physical, psychological, and social) and one second-order factor (general subjective well-being) showed good fit with the data: $\chi^2(6) = 4.68$, $\chi^2/df = 0.78$, CFI = 1.000, TLI = 1.001, RMSEA = .000, 90% CI [.000–.034]. In the present study, the Cronbach's alpha reliability coefficient of general subjective well-being was .75.

## Procedure

Data were collected through both pen-and-pencil and an online questionnaire. Students from Polish universities: the University of Gdańsk, the Polish Naval Academy and the Gdańsk University of Technology were invited to participate anonymously during lectures or classes. The estimated response rate was above 95%. The online survey was conducted via a questionnaire placed on Facebook. Respondents were asked to click on a link to access the survey. The response rate for online surveys is impossible to determine (Fan and Yan 2010). Before starting to respond, the participants received detailed information about the study. Data collection occurred from November 2017 to March 2018. The final sample included 57.1% participants recruited via paper-and pencil survey and 42.9% via online survey. Participation was completely anonymous and no monetary or other material rewards were offered.

## Statistical Analyses

Confirmatory factor analysis (CFA) was performed to assess the construct validity of the BSMAS where a 6-item one-factor solution was tested. In order to investigate the validity of the BSMAS and the BFAS and to explore if SNS addiction and Facebook addiction do reflect the same phenomenon, a model with two latent variables (SNS addiction and Facebook addiction) was investigated where items corresponding to the same criteria were correlated. To indicate the differences between Facebook-only users and multisite-social networkers, the model was also investigated in the two samples. Robust Weighted Least Squares (WLSMV) estimator was used. The following measures were used to evaluate model fit: $\chi^2$ divided by degrees of freedom ($\chi^2/df$), the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI) and the Root Mean Squared Error of Approximation (RMSEA). Cut-off scores for those indexes in terms of acceptable fit are: $\chi^2/df \leq 3$, CFI $\geq 0.95$, TLI $\geq 0.95$, RMSEA $\leq 0.06$ to 0.08 (Hu and Bentler 1999; Schreiber et al. 2006). Mplus 6.11 (Muthén and Muthén 1998–2010) was used to perform the CFA.

Means, standard deviations, percentages, and correlation coefficients were calculated for the entire sample. In the group of multisite-social networkers the correlations between SNS addiction and criteria variables were compared to correlations between Facebook addiction and the same variables. By comparing the correlations, it was possible to investigate whether the BSMAS and BFAS criterion validity was different. Two hierarchical regression analyses were conducted for the multisite-social networkers group where stress and subjective well-being comprised the dependent variables. An overview of the independent variables introduced in the subsequent steps can be found in Table 4. The proposed model allowed testing whether SNS addiction, regardless of other variables, is a source of decreased well-being and increased stress. For all linear regression analyses, preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. To compare latent correlation coefficients between Facebook addiction and SNS addiction between the groups of Facebook-only users and multisite-social networkers a $z$ test for independent groups was used. Furthermore, a $z$ test for dependent groups was used to compare correlation coefficients between Facebook addiction and criterion variables and correlations between SNS addiction and the same criterial variables within the group of multisite-social networkers. All tests were two-tailed, and the alpha level was set to .05.

## Ethics

The study was carried out in accordance with the Declaration of Helsinki. All gathered data was anonymous, and participants were informed about all the proper details about the study and their role in it, including that they could withdraw at any point. Attaining formal and written informed consent was not regarded as necessary as voluntary completion of the questionnaires was regarded as providing consent, the study was anonymous and since no medical information was gathered.

## Results

The model with one factor of SNS addiction showed the following fit indices: $\chi^2(9) = 251.64$, $\chi^2/df = 27.96$, CFI = .924, TLI = .874, RMSEA = .157, 90% CI [.140–.174]. Standardized factor loadings of the items were: .66, .84, .66, .50, .73, .60, respectively. Due to lack of acceptable model fit, residuals of the first and second items were allowed to correlate on the basis of modification indices, similarly to previous studies concerning the BFAS (Atroszko et al. 2018; Charzyńska and Góźdź 2014) and the BSMAS (Monacis et al. 2017). Additionally, residuals of the fourth and sixth items were correlated on the basis of modification indices. The modified model had an acceptable fit: $\chi^2(7) = 47.57$, $\chi^2/df = 6.80$, CFI = .987, TLI = .973, RMSEA = .073, 90% CI [.054, .093]. Standardized factor loadings on items were: .48, .72, .71, .49, .80, .59, respectively. The correlation between residuals of the first and second item was .50, while the correlation between residuals of the fourth and sixth item was .23.

The model with two latent variables (Facebook addiction and Social Networking Sites addiction) and items corresponding to the same criteria correlated did not have an acceptable model fit in the group of Facebook-only users: $\chi^2(47) = 211.06$, $\chi^2/df = 4.49$, CFI = .916, TLI = .882, RMSEA = .155, 90% CI [.134, .176] and in the group of multisite-social networkers: $\chi^2(47) = 577.11$, $\chi^2/df = 12.28$, CFI = .951, TLI = .932, RMSEA = .109, 90% CI [.101, .117]. On the basis of modification indices residuals of the first and second item of the BSMAS, as well of the BFAS were allowed to correlate as well as the residuals of the fourth and sixth items of the BSMAS, as well in the BFAS. Further the residual of the fourth item of the BSMAS was correlated with the residual of the sixth item in the BFAS. Also, the residual of the sixth item of the BSMAS correlated with the residual of the fourth item on the BFAS. In the group of the Facebook-only users the model had a good fit: $\chi^2(39) = 36.12$, $\chi^2/df = .93$, CFI = 1.000, TLI = 1.003, RMSEA = .000, 90% CI [.000, .051]. In the group of the multisite-social networkers, the model also had a good fit: $\chi^2(39) = 97.92$, $\chi^2/df = 2.51$, CFI = .995, TLI = .991, RMSEA = .040, 90% CI [.030, .050]. Standardized factor loadings of the items can be found in Fig. 2. In the group of Facebook-only users the correlation between the BFAS and the BSMAS was .94. In the group of multisite-social networkers this relationship was

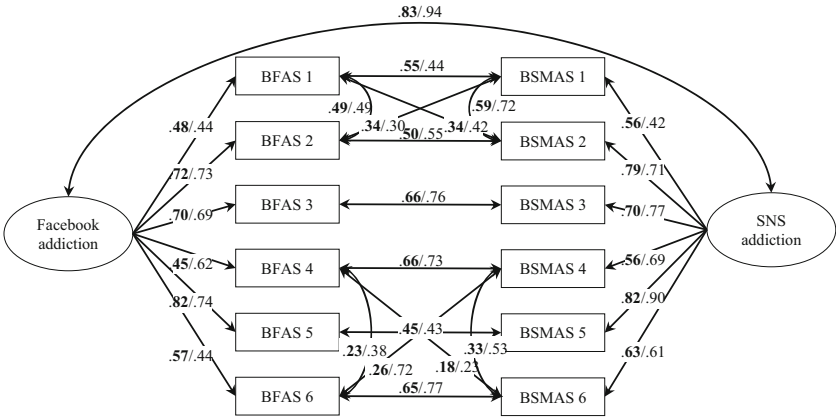


**Fig. 2** The factor structure of the Bergen Social Media Addiction Scale (BSMAS) and Bergen Facebook Addiction Scale (BFAS) for group of Facebook-only users ($n = 146$) and for multi-social networkers ($n = 953$). Standardized loadings are indicated on the arrows. All loadings are significant at $p < .001$. Results for multi-social networkers have been bolded

.83. This difference was statistically significant ($z = 6.12$, $p < .001$).

Table 2 presents mean scores, standard deviations, percentages, and correlation coefficients in the whole sample. In the group of the multisite-social networkers the correlations between SNS addiction and criterion variables were compared to correlations between Facebook addiction and criterion variables. A test $z$ for dependent groups was used to compare these correlation coefficients (see Table 3). According to the polythetic approach (i.e., scoring 4 [*often*] or 5 [*very often*] on at least four out of six items), the percentage of people who meet the criteria of addiction was calculated showing that approximately 8.2% (95% CI = 6.7%– 9.9%) of young adults were identified as SNS addicts and 4.9% (95% CI = 3.8%– 6.3%) as Facebook addicts, respectively.

Regression analysis for perceived stress (see Table 4) showed that the independent variables explained a total of 26.5% of the variance, $F_{9,943} = 37.79$, $p < .001$. Significant independent variables in Step 4 were extraversion ($\beta = -.14$, $p < .001$), conscientiousness ($\beta = -.23$, $p < .001$), emotional stability ($\beta = -.31$, $p < .001$) and SNS addiction ($\beta = .14$, $p = .001$).

Regression analysis for general subjective well-being (see Table 4) showed that the independent variables explained a total of 26.5% of the variance, $F_{9,943} = 37.73$, $p < .001$. Significant independent variables in Step 4 were extraversion ($\beta = .32$, $p < .001$), conscientiousness ($\beta = .23$, $p < .001$), emotional stability ($\beta = .19$, $p < .001$) and SNS addiction ($\beta = -.09$, $p = .029$).

## Discussion

### Validity and Reliability of the BSMAS

The results showed that the model with one factor of SNS addiction had poor fit to the data. Previous studies suggest that such lack of acceptable fit might be related to the fact

**Table 2** Mean scores and standard deviations (*SD*), percentages, and correlation coefficients (Pearson product-moment/point-biserial) between study variables ($n = 1099$)

| Variable | Mean (*SD*)/ Percentages | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. SNS addiction | 14.76 (4.71) | – | | | | | | | | | |
| 2. Facebook addiction | 12.83 (4.76) | .76** | – | | | | | | | | |
| 3. Gender [a] | 71.9% females | −.23** | −.18** | – | | | | | | | |
| 4. Age | 21.44 (2.85) | −.11** | −.04 | .06 | – | | | | | | |
| 5. Extraversion | 8.76 (3.04) | .07* | .05 | −.09** | .03 | – | | | | | |
| 6. Agreeableness | 9.65 (2.31) | −.02 | −.04 | .04 | .03 | .01 | – | | | | |
| 7. Conscientiousness | 9.29 (2.71) | −.14** | −.13** | −.11** | .01 | .11** | .12** | – | | | |
| 8. Emotional stability | 7.98 (2.79) | −.23** | −.21** | .22** | .06* | .08* | .33** | .19** | – | | |
| 9. Openness to experience | 10.08 (2.24) | −.01 | −.03 | −.07* | .03 | .34** | −.07* | .13** | −.07* | – | |
| 10. Perceived stress | 11.18 (3.24) | .28** | .25** | −.12** | −.07* | −.19** | −.09** | −.33** | −.38** | −.07* | – |
| 11. General subjective well-being | 33.80 (8.71) | −.15** | −.13** | .01 | .04 | .37** | .15** | .34** | .29** | .12** | −.54** |

[a] Point-biserial correlation coefficient (0 = female, 1 = male)

*$p < .05$. **$p < .01$

**Table 3** Correlation coefficients (Pearson product-moment/point-biserial) between study variables for multisite-social networkers ($n = 953$)

| Variable | Mean (*SD*)/ Percentages | SNS addiction | Facebook addiction | $z$ | $p$ [b] |
|---|---|---|---|---|---|
| 1. Gender [a] | 74.2% females | −.22** | −.17** | −2.68 | .007 |
| 2. Age | 21.25 (2.41) | −.10** | −.02 | −3.50 | <.001 |
| 3. Extraversion | 8.87 (3.00) | .06 | .05 | .44 | .596 |
| 4. Agreeableness | 9.59 (2.32) | .01 | −.01 | .87 | .290 |
| 5. Conscientiousness | 9.23 (2.70) | −.14** | −.13** | −.44 | .593 |
| 6. Emotional stability | 7.87 (2.79) | −.20** | −.19** | −.45 | .589 |
| 7. Openness to experience | 10.11 (2.22) | −.03 | −.03 | .00 | 1.000 |
| 8. Stress | 11.33 (3.22) | .26** | .23** | 1.35 | .101 |
| 9. General subjective well-being | 33.53 (8.72) | −.14** | −.11** | −1.32 | .110 |

[a] Point-biserial correlation coefficient (0 = female, 1 = male). [b] Critical $p$ value after Bonferroni correction is 0.006

*$p < .05$. **$p < .01$

that measures based on the core components of addiction are additionally influenced by a general component of high time and energy investment into the particular behaviour, which manifests as correlations between items residuals (Atroszko et al. 2018; Atroszko et al. 2017). Thus, correlations between two previously reported pairs of items residuals (Item 1 and Item 2 as well as Item 4 and Item 6; see Atroszko et al. 2018; Bereznowski et al. 2016; Charzyńska and Góźdź 2014; Monacis et al. 2017) were allowed. The modified model showed acceptable fit with the data. All factor loadings were significant, their standardized values were above .40, and the scale had high internal consistency (H1 supported).

## Relationship Between SNS Addiction and Facebook Addiction

The results showed that SNS addiction was strongly associated with Facebook addiction and that this relationship was stronger in the group of Facebook-only users than in the group of multisite-social networkers (H2 supported). These results support good convergent and discriminant validity of the BSMAS (H1 supported), and suggest that SNS addiction is completely equivalent to Facebook addiction among Facebook-only users (as Facebook is the only SNS these individuals use) alas not completely equivalent to Facebook addiction among multisite-social networkers (as Facebook is not the only SNS these individuals use). Therefore, the results support the notion that SNS addiction and Facebook addiction refer to the same underlying addictive process to social networking with somewhat different manifestations which could reflect level of addiction, stage of addiction or subtype of addiction. The construct of SNS addiction seems valid when researchers are interested in general aspects of SNS-functioning, which are relevant for all individuals addicted to SNSs. However, assessment of addiction to a specific SNS (e.g. Facebook) should be conducted when researchers are interested in unique aspects of functioning, which may differ between individuals addicted to specific SNSs (Andreassen and Pallesen 2013; Ryan et al. 2014; see also Throuvala et al. 2019). However, it must be kept in mind that the large majority of SNSs users are multisite-social networkers. Therefore, differentiating by SNSs use might not be the most cost-effective and informative strategy to collect data on addiction (Griffiths 2012; Kuss and Griffiths 2017). A more fruitful approach might be an investigation of SNS addiction along with individuals' motives to use SNSs and activities in which individuals engage in on the SNSs (Andreassen and Pallesen 2013; Griffiths et al. 2014; Kuss and Griffiths 2017; Ryan et al. 2014; see also Throuvala et al. 2019).

## SNS Addiction and Personality

Congruently with previous studies, the results showed that SNS addiction was inversely associated with conscientiousness and emotional stability (H3 supported; De Cock et al. 2014; Marino et al. 2018a). Additionally, SNS addiction was positively associated with extraversion but unrelated to agreeableness and openness to experience. It should be noted, that an in-depth investigation of these relationships requires application of multivariate analyses rather than the analysis of zero-order correlations. For example, currently the data suggests that while zero-order correlations between Facebook addiction and extraversion are either non-significant or negative (Marino et al. 2018a), the more complementary regression models controlling for wide range of personality factors show a positive relationship between them (see Andreassen et al. 2013; Atroszko et al. 2018), which could be potentially explained by the shared covariance between extraversion, neuroticism and Facebook addiction. However, future studies should investigate potential moderating effects of other variables (e.g., culture or patterns of use of SNSs [e.g., active vs.

**Table 4** Results of hierarchical multiple regression analyses in which SNS addiction, Facebook addiction, age, gender and big five personality traits were regressed upon the scores on perceived stress and subjective well-being for multisite-social networkers ($n = 953$)

| | Perceived stress | | General subjective well-being | |
|---|---|---|---|---|
| Predictor | β | $\Delta R^2$ | β | $\Delta R^2$ |
| Step 1 | | .052** | | .012** |
| Facebook addiction | .23** | | −.11 | |
| Step 2 | | .006* | | .001 |
| Facebook addiction | .22** | | −.11** | |
| Gender[a] | −.07* | | −.02 | |
| Age | −.04 | | −.01 | |
| Step 3 | | .198** | | .248** |
| Facebook addiction | .14** | | −.06 | |
| Gender[a] | −.05 | | .00 | |
| Age | −.03 | | −.00 | |
| Extraversion | −.13** | | .31** | |
| Agreeableness | .06 | | .05 | |
| Conscientiousness | −.24** | | .24** | |
| Emotional stability | −.31** | | .19** | |
| Openness to experience | −.01 | | .01 | |
| Step 4 | | .008** | | .004* |
| Facebook addiction | .04 | | .01 | |
| Gender[a] | −.04 | | −.01 | |
| Age | −.02 | | −.01 | |
| Extraversion | −.14** | | .32** | |
| Agreeableness | .05 | | .05 | |
| Conscientiousness | −.23** | | .23** | |
| Emotional stability | −.31** | | .19** | |
| Openness to experience | −.01 | | .01 | |
| SNS addiction | .14** | | −.09** | |
| Total $R^2$ | | .265** | | .265** |

[a] 0 = female, 1 = male

*$p < .05$. **$p < .01$

passive]) on the relationships between SNS addiction and personality traits (see also Marino et al. 2018a).

## SNS Addiction, Facebook Addiction, and their Relationships with Criterion Variables in Group of Multisite-Social Networkers

SNS addiction and Facebook addiction differed in strengths of their relationships with gender and age (in both cases the relationship with SNS addiction was stronger). On the other hand, there were no differences in strengths of their relationships with personality traits, perceived stress, and general subjective well-being. However, it is worth noting that although the differences were not statistically significant, the relationships with SNS addiction were stronger than the relationships with Facebook addiction in cases of almost all criterion variables. These results show there were some minor differences in strengths of relationships of SNS addiction and Facebook addiction with the criteria variables; however, the differences were by and large marginal (H5 supported). Consequently, it suggests that, with

adequate caution, studies of correlates of SNS addiction and Facebook addiction can be perceived as complementary (e.g. studies on correlates of Facebook addiction seem to converge with studies on correlates of SNS addiction and vice versa). Therefore, future studies on correlates of SNS addiction and Facebook addiction may be assumed to produce similar results, indicating the presence of generic antecedents and consequences. It should however be noted that this assumption might be limited to the present study's variables and sample.

### SNS Addiction, Facebook Addiction, Perceived Stress, and General Subjective Well-Being

The results showed that SNS addiction was positively associated with perceived stress and negatively associated with general subjective well-being even after controlling for Facebook addiction and other studied variables, which is congruent with previous studies (H4 and H6 substantiated; Hou et al. 2017; Marino et al. 2018b; Pontes 2017; Tromholt 2016; Turel et al. 2018; Xue et al. 2018). Facebook addiction showed a similar relationship with these variables before controlling for SNS addiction. These results suggest that there is a disproportion in the unique contribution of SNS addiction and Facebook addiction to the impaired functioning of individuals. Possibly, such disproportion is a result of differences in the specificity between SNS addiction and Facebook addiction (see Griffiths 2012). The former is a broader construct, which overlaps with the latter as well as include other addictions to particular SNSs (e.g. Instagram, Snapchat, Twitter; Kuss and Griffiths 2017). As a result, all of the impairment related to Facebook addiction are also present in SNS addiction, while SNS addiction seems to be associated with additional impairment. Hence, these results complement a picture of the relationship between SNS addiction and Facebook addiction.

### Strengths and Limitations

To the best of our knowledge this is the first empirical study investigating the relationship between SNS addiction and Facebook addiction, being a subject of heated theoretical discussion during the recent years (see Andreassen and Pallesen 2013; Griffiths 2012; Griffiths et al. 2014; Kuss and Griffiths 2017). Moreover, the present study also sheds light on methodological and theoretical challenges related to the high number of multisite-social networkers among users of SNSs. It comprised a relatively large sample size (providing high statistical power) as well as use of valid and reliable psychometric tools. Consequently, it significantly adds to the existing literature on behavioral addictions and provide valuable insights into the nature of the relationship between SNS addiction and Facebook addiction.

In terms of limitations, the sample size of Facebook-only users was relatively small (although quite well representing proportions in population of SNSs users; GlobalWebIndex 2017) which reduced statistical power regarding the comparison between Facebook-only users and multisite-social networkers. Moreover, all data were self-reported and a cross-sectional design was used, rendering the data vulnerable to limitations associated with such data (e.g., common method, social desirability and recall biases). The sample was not representative of the general population of SNS users and mainly comprised students, which puts restrictions on the generalizability to other populations.

## Conclusions and Future Studies Directions

The present study showed that SNS addiction can be validly and reliably measured among young adults in Poland. What is more, it provided empirical data about the relationship between SNS addiction and Facebook addiction, which appear to be reflecting common addictive process to social networking with somewhat specific manifestations. Nevertheless, SNS addiction seems to be a more suitable construct to study in most cases, firstly because the large majority of SNSs users are multisite-social networkers (GlobalWebIndex 2017). Thus, in many cases it is difficult to apply methodological and statistical procedures which would allow to study differences between addictions to particular SNSs (and in some cases it might not be even possible). Secondly, a more generic assessment approach seems preferable because other variables related to usage of SNSs (e.g. motives to use SNSs, activities in which users engage on SNSs, patterns of use of SNSs [e.g. active vs. passive]) seems to be more important to identify than to study correlates of particular SNS (Andreassen and Pallesen 2013; Griffiths et al. 2014; Kuss and Griffiths 2017; Ryan et al. 2014; see also Throuvala et al. 2019). Thirdly, a more generic assessment in terms of predictors and consequences seems to correspond well to the findings obtained when assessing addiction to more specific SNS. However, Facebook addiction and other addictions to particular SNSs might still be useful constructs, for example they might be used to determine which of addictions to particular SNS are the biggest contributors to the individuals' harm (e.g. deteriorated well-being) or which of addictions to particular SNS are the biggest contributors to general SNS addiction. Consequently, such studies could lead to successful therapeutic interventions focusing on the most harmful SNSs.

Future studies should further investigate the relationship between SNS addiction and Facebook addiction (e.g. measurement invariance between BSMAS and BFAS, as well as multi-group analysis to compare the group of Facebook-only users and the group of multisite-social networkers). Such investigations should consider using purposive sampling in order to maximize the number of Facebook-only users participating, and thus the relevant statistical power. Future studies should also investigate the relationships between SNS addiction and other addictions to particular SNSs (e.g. Instagram, Snapchat, Twitter) as well as the

relationships between different addictions to particular SNSs (e.g. Facebook vs. Instagram). Moreover, we suggest implementing question about SNSs used by participants as a standard procedure in future studies as it appears that differentiation between multisite-social networkers and users of a single SNS (e.g. Facebook-only users) might be essential to facilitate advancement in this field. Future studies should also investigate the potential role of motives to use SNSs, activities in which users engage on SNSs, and patterns of use of SNSs (e.g. active vs. passive) in terms of SNS addiction. Last but not least, future studies should also include further investigation of addictive properties of SNS addictions as well as harm and distress caused by specific and generic SNS addictions.

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**Data Availability** The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

## Compliance with Ethical Standards

**Informed Consent** Informed consent was obtained from all individual participants included in the study. All gathered data was anonymous, and participants were informed about all the proper details about the study and their role in it, including that they can withdraw at any point. Attaining formal and written informed consent was not regarded as necessary as voluntary completion of the questionnaires was regarded as providing consent, and no medical information was gathered.

**Ethical Approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee (Ethics Committee for Research Projects at the Institute of Psychology, University of Gdańsk; reference number: 15/2019) and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Disclosure of Potential Conflicts of Interest** The authors declare that they have no conflict of interest.

## APPENDIX

Bergen Social Media Addiction Scale

Instruction: Below you find some questions about your relationship to and use of social networking sites (Facebook, Twitter, Instagram and the like). Choose the response alternative for each question that best describes you.

How often during the last year have you...

[Instrukcja: Poniżej znajduje się kilka pytań dotyczących myśli, zachowań i odczuć dotyczących portali społecznościowych (Facebook, Twitter, Instagram itp.).

Prosimy, abyś dla każdego pytania zaznaczył(−a), jak często w ciągu ostatniego roku…]

| Item | Addiction component | Wording |
|---|---|---|
| BSMAS1 | Salience | spent a lot of time thinking about social networking sites or planned use of social media?<br>[myślałeś(aś) o portalach społecznościowych lub planowałeś(aś) ich używanie?] |
| BSMAS2 | Tolerance | felt an urge to use social networking sites more and more?<br>[odczuwałeś(aś) rosnącą potrzebę korzystania z portali społecznościowych?] |
| BSMAS3 | Mood modification | used social networking sites in order to forget about personal problems?<br>[używałeś(aś) portali społecznościowych, żeby zapomnieć o problemach osobistych?] |
| BSMAS4 | Relapse | tried to cut down on the use of social networking sites without success?<br>[próbowałeś(aś) bezskutecznie ograniczyć używanie portali społecznościowych?] |
| BSMAS5 | Withdrawal | become restless or troubled if you have been prohibited from using social networking sites?<br>[byłeś(aś) niespokojny(a) lub zmartwiony(a), jeśli nie mogłeś(aś) używać portali społecznościowych?] |
| BSMAS6 | Conflict | used social networking sites so much that it has had a negative impact on your job/studies?<br>[używałeś(aś) portali społecznościowych tak dużo, że miało to negatywny wpływ na Twoją naukę/pracę?] |

Response options were: (1) *very rarely*, (2) *rarely*, (3) *sometimes,* (4) *often*, (5) very *often.*

[] Includes Polish translation of Bergen Social Media Addiction Scale.

**Scoring:** Add the scores of the items for the total score.

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# Which aspects of narcissism are related to Social Networking Sites addiction? The role of self-enhancement and self-protection

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ABSTRACT

Narcissism was found to be one of the essential personality-related risk factor of Social Networking Sites (SNS) addiction. However, most of the research neglected its heterogeneous nature. In this study, we focus on four aspects of narcissism (i.e., admirative narcissism, communal narcissism, rivalrous narcissism, and vulnerable narcissism), acknowledging that they might be associated with different underlying narcissistic motives (i.e., self-enhancement or self-protection) and realized in different domains (i.e., agency or communion). We tested whether four aspects of narcissism separately and additively contribute to SNS addiction using self-report measures of narcissism and SNS addiction in three cross-sectional studies ($N$ = 1659; one students' sample and two general Polish samples). The results indicate that all four aspects of narcissism were positively related to SNS addiction. However, only rivalrous, communal, and vulnerable narcissism aspects were independent predictors of SNS addiction. We also conclude that SNSs might not be the optimal platform for gaining gratifications via solely agentic self-enhancement. Furthermore, SNS addiction may develop not only as a compensatory mechanism of interpersonal sensitivity and poor social relations in the relatively controllable SNS' environment (as indicated by vulnerable narcissism) but also maladaptive self-regulation via antagonism and hostility towards others (as indicated by rivalrous narcissism).

## 1. Introduction

Social Networking Sites (SNSs) are "virtual communities where users can create individual public profiles, interact with real-life friends, and meet other people based on shared interests" (Kuss & Griffiths, 2011, p. 3529). From the beginning of the XXI century, SNSs have become one of the most popular Internet platforms. Utile explanation of their popularity is offered by the Self-Determination Theory (Ryan & Deci, 2019), which states that satisfaction of three innate and universal needs for autonomy, competence, and relatedness motivates human behavior (Sheldon & Gunz, 2009). The complex construction of SNSs provides affordances to fulfill all three (Karahanna et al., 2018), thus making SNS use gratifying (e.g., receiving Facebook likes fulfilling the need for relatedness or uploading self-presentational Instagram Story fulfilling the need for autonomy). Given that SNSs are easily accessible (e.g., with a smartphone), those gratifications are constantly at users' fingertips. The ease with which one gains rewards with SNS can potentially lead to narrowing one's range of other need-fulfilling behaviors (e.g., losing interest in other forms of social contact) and, in turn, increase the addictive salience of SNS use in that regard (Masur et al., 2014). Thus, along with the propagation of SNSs, research on problematic or addictive use of them has emerged in recent years (Kuss & Griffiths, 2017).

The symptoms of SNS addiction have been examined in the context of the components model of addiction and are described as salience, mood modification, tolerance, withdrawal, relapse, and conflict (Griffiths, 2005). As an example of behavioral addiction, SNS addiction may be a serious mental health problem causing negative consequences for one's subjective well-being (Hussain & Griffiths, 2018), such as depression or insomnia (Brailovskaia et al., 2019). Previous studies have emphasized the prominence of the personality-related predisposing factors for the development of different behavioral addictions (e.g., Andreassen et al., 2013). According to subjective researchers' and psychotherapists' perspectives, narcissism is one of the essential personality-related risk factors of SNS addiction (Dalvi-Esfahani et al., 2019). However, most of the research has focused on a broad conceptualization of narcissism, neglecting its complexity (Casale & Banchi, 2020). In our study, we fill this gap in the literature and focus on four aspects of narcissism, acknowledging that narcissism might be (1)

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associated with different underlying motives (i.e., self-protection or self-enhancement) and (2) realized in different domains (i.e., agency or communion).

### 1.1. Heterogeneous nature of narcissism

Narcissism is characterized mainly by egocentric exceptionalism (i.e., feelings of superiority, self-importance) and social selfishness. However, many theoretical models describe it as a heterogeneous, "polyhedric" construct with different, often contradictory, features (Sedikides, 2021). There is a common agreement that narcissism, although possible to be defined by its universal characteristics, may be manifested in two forms: grandiose and vulnerable (Miller et al., 2011; Wink, 1991). Grandiose narcissism is characterized by approach/promotion orientation (i.e., self-enhancement) and focuses on highlighting one's exceptionalism and confirming grandiose self-views. It is linked to higher positive emotionality, stable self-esteem, and higher subjective well-being (Miller et al., 2017). In contrast, vulnerable narcissism, characterized by avoidance/prevention orientation (i.e., self-protection) and focus on potential ego threats, is linked to higher negative emotionality (e.g., anxiety) and contingent self-esteem (Miller et al., 2017).

Recently, the grandiosity-vulnerability dichotomy was expanded by more in-depth conceptualizations. Firstly, grandiose narcissism was parsed into admirative and rivalrous aspects, reflecting self-enhancement and self-protection, respectively (Back et al., 2013; Grapsas et al., 2019). Thus, rivalrous narcissism resembles the vulnerable one to some extent (Gebauer & Sedikides, 2018). Secondly, research consistently showed that self-enhancement is primarily realized in the agency (Campbell & Foster, 2007) but not the communion domain (i.e., unmitigated agency). Agency-Communion Model of Narcissism (Gebauer et al., 2012; Gebauer & Sedikides, 2018) is a recent endeavor to explain communal self-enhancement by highlighting the understanding of communal narcissism as a parallel (to agentic) aspect of grandiose narcissism (Luo et al., 2014).

To sum up, at least four distinct aspects of individual narcissism can be found in its recent conceptualizations. Following Sedikides (2021), in this paper, we refer to them as admirative narcissism, communal narcissism, rivalrous narcissism, and vulnerable narcissism. We consequently analyze them as independent yet coexisting aspects of trait narcissism. Admirative and communal narcissism aspects are both based on self-enhancement motive but differ in terms of the domain (agency vs. communion) in which the self is enhanced. Vulnerable and rivalrous aspects of narcissism are both based on self-protection motive but differ in means of protecting the self – with ego-threat avoidance as the main strategy for the first and seeking dominance for the latter.

### 1.2. Relationships between different aspects of narcissism and SNS addiction

In previous studies, the mechanism linking narcissism and SNS addiction had been inferred predominantly on self-enhancement characteristics (e.g., Andreassen et al., 2017; Balcerowska et al., 2019). According to this mechanism, SNSs provide an opportunity for the ego-boosting positive feedback that narcissists crave (McCain & Campbell, 2018; Nadkarni & Hofmann, 2012). SNSs use satisfies narcissistic needs for recognition and uniqueness (McCain & Campbell, 2018), which might lead to addictive use of those platforms (Andreassen et al., 2017). Alternative addiction mechanism concerns self-protection motive, and it is based on the usefulness of SNSs in dealing with interpersonal sensitivity (e.g., social anxiety; Zsido et al., 2021). Providing possibilities for controlled self-presentation, SNSs represent a safe environment in which ego-threatening negative feedback might be avoided. Moreover, they provide opportunities for positive feedback, which might be challenging to get offline (Brailovskaia et al., 2020). That mix of positive and negative reinforcements might lead to progressive narrowing of the range of other available means of self-regulation, which is the main symptom of SNS addiction (Andreassen, 2015). Although those mechanisms are fairly well described in the literature, acknowledging narcissism's complexity allows identifying more specific patterns of SNS behavior. Namely, domain specificity (following Agency-Communion model of narcissism; (Gebauer et al., 2012)) in self-enhancement and different self-protection strategies (avoidance and seeking dominance) were not examined in the context of SNS addiction yet. Below, we describe possible pathways leading to SNS addiction that might be attributed to each of four aspects of narcissism.

Admirative narcissism, based on self-enhancement in the agentic domain, is related to social potency and psychosocial adjustment, characterized by confidence and high self-esteem, but also self-absorption, exhibitionism, and vanity (Ackerman et al., 2010). The grandiose self is maintained via self-promotion strategy (Back et al., 2013) related to one's sense of uniqueness and grandiose fantasies, which results in self-assured behavior. SNSs may serve as a handy platform for agentic self-enhancement (Panek et al., 2013), given that display of agency (e.g., achievements or material) is possible to a large audience and manifestations of social approval (e.g., "likes" and comments; Andreassen et al., 2017) are visible and countable. Thus, aiming to gain stronger (or more frequent) ego-boosts, one might use this feedback and adjust online behavior and image to maintain favorable self-views or desired position in the social hierarchy (Wadsley et al., 2021). This might, in turn, result in compulsive checking of owned SNS profile or frequent posting self-promotional content in order to gain more and more positive feedback from others, fulfilling the need to be admired (Casale & Fioravanti, 2018).

Communal narcissism, similarly to admirative narcissism, is linked to psychosocial adjustment (Gebauer et al., 2012; Gebauer & Sedikides, 2018) and possessing resources to manage life's adversities, such as other's sympathy (Rentzsch & Gebauer, 2019) and social support (Gąsiorowska et al., 2021). Moreover, self-enhancement in the communion domain limits overt expressions of grandiosity and high position in the social hierarchy, motivating self-promotion with socially approved means (e.g., self-sacrificing or helping others). However, the sole construction of SNSs makes it a convenient platform to self-enhance with low costs, also in the communion domain. Often being a member of online social networks does not require concrete action or behavior and might be based on unverifiable self-serving declarations only. Additionally, SNSs provide wide yet largely superficial social networks, enabling stronger (as seen by a larger audience) and more frequent communion-based ego-boosts (e.g., acquiring new friends on SNSs) with smaller effort, compared to offline relations. As a result, SNSs use can substitute other means of self-enhancing in the communal domain, increasing the risk of addiction. In line with that, it was shown that communal narcissism is related to a higher frequency of SNSs use, motivated by seeking validation and higher ratings of self-presented content (Kristinsdottir et al., 2021).

Rivalrous narcissism, often omitted in SNSs research, is aimed to protect one's grandiose self-views. It is linked to poor adjustment (Back et al., 2013; Miller et al., 2015), characterized by antagonism, manipulativeness, and entitlement (Ackerman et al., 2010). The grandiose self is maintained with self-protection, which involves striving for supremacy and devaluation of others (Back et al., 2013). Linked to low empathy and poor social relations (e.g., Leckelt et al., 2015), rivalrous narcissism is characterized by dysfunctional emotional regulation (Cheshure et al., 2020). Such a self-protection strategy might be manifested as aggressive online behavior (e.g., interpersonal manipulation, cyberbullying, and trolling; Craker & March, 2016). In non-anonymous use of the Internet, readiness to aggressively react to ego-threats is manifested by constant, compulsive checking whether "others are talking about me", retaliating against mean comments, and getting into hostile conversations (Carpenter, 2012). Further, the indirect nature of online interactions gives the opportunity to behave spitefully without the need to endure the social consequences following the bullying (such as ostracism). Thus,

SNSs may be useful in this type of dysfunctional emotional regulation, as they provide opportunities to indulge hostile tendencies in an almost cost-free environment. Similar to other aspects of narcissism, this ease of low-cost rewards may substitute "real-life" means of satisfying narcissistic motives, and increase the risk of SNS addiction.

Vulnerable narcissism is characterized by a fragile grandiose self, which might be easily (compared to other aspects of narcissism) undermined by others. Thus, it is associated with self-protection and avoidant/preventing strategies, expressed in hypersensitivity and anxiety (Miller et al., 2011). Characteristics of SNSs may prevent feelings of such distress from occurring or alleviate them. For example, vulnerable narcissism is related to spending more time editing photos before posting on SNSs (Sheldon & Bryant, 2016), motivated by avoiding negative feedback from other users. Creating a fully controlled, unrealistic, positive online image, such as promoting the most attractive self-portrait photos (Fox & Rooney, 2015), may be characteristic of all aspects of narcissism; however, for vulnerable one, it is derived from self-protective avoidance of ego-threats. The possibility of such controlled impression management (lack of face-to-face contact, possibility of controlling one's profile, and sharing only selected information) might reduce anxiety and distress in dealing with others (Brailovskaia & Bierhoff, 2016). In line with this, vulnerable narcissism is related to preference for online (vs. offline) social interactions (Ksinan & Vazsonyi, 2016) and utilizing SNSs as a relatively safe place for (controlled) self-expression, improving mood, and regulating negative emotions (Brailovskaia et al., 2020). Although the role of vulnerable narcissism in SNS addiction is still understudied (compared to grandiose; Casale & Banchi, 2020), it was found that vulnerable narcissism is positively related to SNS addiction (Brailovskaia et al., 2020; Casale & Banchi, 2020; Shin et al., 2016).

### 1.3. Current study

The major limitation of previous investigations was studying narcissism without considering its complex and heterogeneous nature (Gnambs & Appel, 2018; McCain & Campbell, 2018), and this research aimed to fill this gap. We based our reasoning on the assumption that easily gained gratifications may substitute other means of satisfying one's needs, which in turn lead to addiction. We approached narcissism analytically, treating its aspects as tendencies for utilizing specific behaviors – coexisting personality traits, not independent narcissism types (Back et al., 2013; Gebauer et al., 2012). This trait-focused approach enabled us to test specific means of maintaining grandiose self-views, reflecting different behaviors or situations on SNSs that people might find rewarding. Congruently with previous research (Brailovskaia et al., 2020; Casale & Banchi, 2020), we claim that self-enhancement and self-protection motives might have independent roles in developing SNS addiction. Moreover, given that both self-enhancement and self-protection motives might be realized with different means, we test whether different narcissism aspects separately and additively contribute to SNS addiction. Therefore, this research is theoretically important in three ways: (1) it is, to our knowledge, the first one examining the link between communal narcissism and SNS addiction, which might be later used as a framework of reference; (2) consequently, it is the first one to examine the whole narcissism spectrum within this context, which might be useful to decide on how narrow narcissism might be conceptualized in further studies on SNS addiction; (3) as narcissism aspects are representations of various motives, this research examines their relative contribution to SNS addiction, which fits into the multicausal understanding of addictive behaviors (Griffiths, 2005).

Although studying narcissism provides vital information on specific personality factors contributing to the development of SNS addiction, its relative contribution should be investigated concerning other characteristics, both demographic and psychological.

First, age plays a vital role in the frequency, motivation, and SNSs use patterns (Gambo & Özad, 2020). Specifically, most heavy SNSs users are still young adults (Pew Research Center, 2021), who are more emotionally impacted by SNS use than older users (Hayes et al., 2015). For the young generation, social networking is not only using particular applications but also a way of being and relating (Kuss & Griffiths, 2017). Additionally, narcissism decrease with age (Wetzel et al., 2020). Given that both intensive SNSs use and narcissism are possibly age-related, it is necessary to control age in studies concerning these constructs. Further, it is also important to cover age-diverse samples to test for the universality of effects analyzed in our study.

Another demographic characteristic related to both SNS addiction and narcissism is gender. Despite the slight predominance of men among SNS users (Statista, 2021), women more frequently treat SNSs as an integral part of their life than men (Biernatowska et al., 2017), and excessive SNSs use is related stronger to women's well-being (Oberst et al., 2017; Twenge & Martin, 2020). In line with this, studies explicitly showed that using SNSs is more harmful to women (Twenge et al., 2020), who also might be at a greater risk of SNS addiction than men (Marino et al., 2018). The relationship between gender and narcissism is not as straightforward, given the complex nature of the construct, which was recognized only recently. Meta-analytic research (Grijalva et al., 2015) showed that grandiose narcissism is higher among men and that this difference is driven by its rivalrous and power-related admirative aspects. However, gender differences were neither found in vulnerable narcissism nor in communal narcissism (Gebauer et al., 2012; Lui et al., 2019).

Finally, we argue that controlling for self-esteem is necessary for all studies concerning narcissism. Although grandiose narcissism is often identified as excessive or unrealistically high self-esteem, these are two different phenomena: narcissism is related to the feelings of superiority (Brummelman et al., 2016) and focus on hierarchy (Mahadevan et al., 2019), whereas self-esteem is not. Nevertheless, studies show robust associations between the two, and self-esteem is often used as a criterion for separating different aspects of narcissism. Specifically, it is related negatively to vulnerable (Miller et al., 2011) and rivalrous (Back et al., 2013; Miller et al., 2015) narcissism, and positively to admirative (Back et al., 2013) and communal narcissism (Gebauer et al., 2012). Moreover, the relationship between SNS addiction and vulnerable narcissism is often explained similarly to its link with self-esteem. As emphasized by the theory of compensatory Internet use (Kardefelt-Winther, 2014), individuals experiencing insecurity in relationships are prone to develop negative self-identity and are more likely to use SNSs to compensate social needs due to deficiencies in self-esteem and life satisfaction. Individuals with low self-esteem use SNSs to overcome or avoid problems, create social capital, and express themselves in a better view (Błachnio et al., 2016). Furthermore, the lack of direct contact with other users reduce their fear of being judged (Forest & Wood, 2012). In line with this, low self-esteem might contribute to a greater vulnerability to SNS addiction (Andreassen et al., 2017). To sum up, narcissism and self-esteem are related, and both were studied as predictors of SNS addiction. Therefore, their effects should be dissected independently.

#### 1.3.1. Hypotheses and overview of the studies

We expected that all four narcissism aspects are related (on the zero-order level) to SNS addiction positively. Further, given different underlying motives (self-enhancement and self-protection), we expected that admirative and communal narcissism aspects are linked to SNS addiction independently from rivalrous and vulnerable ones. Nonetheless, we assumed that admirative and communal narcissism aspects are relatively similar in terms of online behavior patterns (i.e., self-promotion) and differ only in the self-presentation domain. Therefore, we did not formulate any assumptions on their independent links to SNS addiction, analyzing them exploratorily. Moreover, we expected that rivalrous and vulnerable narcissism aspects reflect different self-protective strategies, translating to glaring differences in behavior (avoidance vs. seeking supremacy), and thus are linked to SNS addiction independently.

We examined the relationship between narcissism and SNS addiction on three samples of SNS users (students sample and two general Polish samples). Such a multi-study approach is in line with the self-replication framework concept (Tunç & Tunç, 2020) - we tested the same hypotheses in all three but systematically modified the sample and measurement, aiming for higher internal and external validity, and thus, replicability of the results. Specifically, in Studies 1 and 2, we examined zero-order and independent effects of admirative, rivalrous, and communal narcissism aspects on SNS addiction. However, as Study 1 was conducted on a relatively homogenous population (university students), we conducted Study 2 on a general Polish sample. In Study 3, we cross-validated the results of Studies 1 and 2 on different general Polish sample and additionally tested whether vulnerable narcissism is linked to SNS addiction (both on a zero-order level and independent of other aspects of narcissism). As mentioned above, narcissism aspects, although positively related, might suppress each other's effects on outcomes (e.g., Back et al., 2013). Therefore, we included all studied narcissism aspects in multiple regression analyses, irrelevant of the significance of their zero-order correlations with SNS addiction, acknowledging this potential for mutually suppressive effects. Databases and all study materials are available at https://osf.io/jh5ye/?view_only=b41f02974982420fb38a869792e32ba2.

## 2. Study 1

We conducted Study 1 to examine the hypotheses in the population, which according to previous studies (Kuss & Griffiths, 2017), is most prone to develop SNS addiction – young Internet users. It also provided a basis, which could then be cross-validated in other samples.

### 2.1. Method

#### 2.1.1. Participants and procedure

We conducted Study 1 on 649 SNSs users, which included 456 (70.3%) women and 191 (29.4%) men, and 3 persons who did not report gender (0.3%). The mean age of participants was $M_{age} = 21.37$ years ($SD = 2.73$). Undergraduate students from different Polish universities affiliated with different faculties, courses of study, and years of study constituted 597 (92.0%) of the sample. Data was collected through paper-and-pencil (32.2%; during lectures or classes) and an online questionnaire (67.8%; published on Facebook). Data was collected between November 2017 and March 2018. The sample size was not determined a priori; therefore, we conducted sensitivity power analysis (Lakens, 2021) to establish the smallest effect detectable with sufficient power (.80). With $\alpha = .05$ set as a significance threshold, this sample was sufficient to detect effects of $r = .11$ for zero-order correlations and Cohen's $f^2 = .012$ for single coefficients in multiple regression. Prior to data collection, participants received detailed information about the study. Participation in the study was anonymous, and no material rewards were offered.

#### 2.1.2. Instruments

*Social Networking Sites Addiction* was measured with Bergen Social Media Addiction Scale (BSMAS; Andreassen et al., 2016; Polish adaptation Balcerowska et al., 2020). It contains six items (e.g., "How often during the last year have you used social networking sites in order to forget about personal problems?") that are based on core addiction components (Griffiths, 2005). Participants responded using a 5-point scale, ranging from *very rarely* (1) to *very often* (5). Item scores were averaged to create the SNS addiction index.

*Admirative narcissism* was measured with two subscales of Narcissistic Personality Inventory-13 (NPI-13, Gentile et al., 2013; Polish adaptation Żemojtel-Piotrowska et al., 2019): Leadership/Authority (LA) containing four items (e.g., "I am a born leader"), and Grandiose Exhibitionism (GE) containing five items (e.g., "I know that I am a good person because everybody keeps telling me so"). In both, participants responded using a 7-point scale, ranging from *strongly disagree* (1) to *strongly agree* (7). Item scores of each were averaged (after reversing scores where necessary) to create indexes of LA and GE.

*Communal Narcissism* was measured with Communal Narcissism Inventory (CNI; Gebauer et al., 2012; Polish adaptation Żemojtel-Piotrowska et al., 2016). It contains 16 items (e.g., "I am the most helpful person I know.") to which participants responded using a 7-point scale, ranging from *strongly disagree* (1) to *strongly agree* (7). Item scores were averaged to create a communal narcissism index.

*Rivalrous Narcissism* was measured with the Entitlement/Exploitativeness (EE) subscale of NPI-13 (Gentile et al., 2013; Polish adaptation Żemojtel-Piotrowska et al., 2019). It contains four items (e.g., "I will never be satisfied until I get all that I deserve") to which participants responded using a 7-point scale, ranging from *strongly disagree* (1) to *strongly agree* (7). Item scores were averaged to create the EE index.

*Self-esteem*. Self-esteem was measured with a single-item (Atroszko et al., 2017) developed on the basis of items from the WHOQOL Bref scale (Skevington et al., 2004). The question was as follows: "How satisfied are you with yourself?" with a 9-point response scale, from *very dissatisfied* (1) to *very satisfied* (9).

### 2.2. Results and discussion

Table 1 presents mean scores, standard deviations, percentages, and correlation coefficients of the Study 1 variables. SNS addiction was related negatively to age and was higher among women. Further, it was related negatively to self-esteem, and positively to admirative (LA and GE) and rivalrous (EE) aspects of narcissism. No significant association between SNS addiction and communal narcissism was found.

We used hierarchical multiple regression analysis to examine the independent effects of admirative, rivalrous, and communal aspects of narcissism on SNS addiction. We entered controlled demographic variables (i.e., age and gender) in Step 1. In Step 2, we entered admirative (i.e., LA and GE) and rivalrous (EE) aspects of narcissism. In Step 3, we entered communal narcissism. Finally, in Step 4, we entered self-esteem. Using that approach, we tested the relationships in an increasing level of detail, controlling for potential confounding variables. Details of regression analyses are presented in Table 2.

Consistently with previous research, gender was the most robust predictor of SNS addiction – it was higher among women in all regression models. Our assumptions on the role of admirative and rivalrous narcissism in SNS addiction were partially confirmed. Grandiose exhibitionism (GE) aspect of admirative narcissism (but not Leadership/Authority [LA]) was uniquely and positively related to SNS addiction in all regression models (and thus, it was independent of the effects of rivalrous narcissism), and this relation was stronger when self-esteem was controlled. In contrast, the positive relation between rivalrous narcissism and SNS addiction was insignificant after self-esteem was taken into account. Finally, communal narcissism was related to SNS addiction only after controlling for self-esteem. All predictors (Step 4) explained a total of 12.8% of SNS addiction variance.

## 3. Study 2

The aim of Study 2 was to cross-validate and increase the generalizability of Study 1 results. To do so, we tested the same assumptions on a different sample and using alternative instruments. Specifically, to overcome generation-related explanations of the results, we examined an older sample derived from a general Polish population. Moreover, we aimed to overcome instrument-based explanations of the results and limitations of the "classical" measure of narcissism (Narcissistic Personality Inventory; see Foster et al., 2018 or Rogoza et al., 2018 for details), we used an alternative measure of admirative and rivalrous narcissism (Narcissistic Admiration and Rivalry Questionnaire; Back et al., 2013).

**Table 1**
Means, standard deviations, and correlations with 95% confidence intervals (Study 1)

| Variable | *M* | *SD* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|---|
| 1. Age | 21.37 | 2.73 | | | | | | | |
| 2. Gender | 30% men | | .09** [.03, .15] | | | | | | |
| 3. Leadership/Authority | 13.66 | 5.82 | .00 [−.07, .08] | .05 [−.03, .13] | | | | | |
| 4. Grandiose Exhibitionism | 16.80 | 5.74 | −.06 [−.14, .02] | .01 [−.07, 0.08] | .51** [.45, .57] | | | | |
| 5. Entitlement/Exploitativeness | 15.37 | 4.90 | −.02 [−.09, .06] | .00 [−.07, .08] | .72** [.68, .76] | .48** [.42, .54] | | | |
| 6. Communal Narcissism | 3.73 | 0.95 | −.06 [−.13, .02] | .00 [−.08, .08] | .28** [.21, .35] | .35** [.28, 0.41] | .21** [.14, 0.29] | | |
| 7. Self-esteem | 5.38 | 1.98 | −.02 [−.10, .06] | .02 [−.05, .10] | .25** [.18, .32] | .41** [.34, .47] | .15** [.07, .22] | .38** [.31, .44] | |
| 8. SNS addiction | 2.48 | .78 | −.10* [−.18, −.02] | −.26** [−.33, −.19] | .06 [−.01, .14] | .13** [.05, .20] | .13** [.06, .21] | .07 [−.01, .15] | −.12** [−.20, −.05] |

* $p < .05$.
** $p < .01$.

**Table 2**
Hierarchical multiple regression analysis, in which SNS addiction was the dependent variable (Study 1)

| | Step 1 | Step 2 | Step 3 | Step 4 |
|---|---|---|---|---|
| | β 95% CI | β 95% CI | β 95% CI | β 95% CI |
| Age | −.08* [−.16, −.01] | −.07 [−.15, .01] | −.07 [−.15, .01] | −.07 [−.14, .01] |
| Gender: men | −.24** [−.33, −.17] | −.24** [−.32, −.17] | −.24** [−.32, −.17] | −.24** [−.32, −.17] |
| Leadership/Authority | | −.08 [−.19, .03] | −.08 [−.20, .03] | −.06 [−.17, .05] |
| Grandiose Exhibitionism | | .11* [.01, .19] | .10* [.01, .19] | .16** [.07, .26] |
| Entitlement/Exploitativeness | | .13* [.03, .25] | .14* [.03, .25] | .11 [−.01, .22] |
| Communal Narcissism | | | .03 [−.05, .11] | .08* [−.00, .16] |
| Self-esteem | | | | −.21** [−.29, −.12] |
| $R^2$ increase | | $\Delta R^2 = .025$ $F_{(3,624)} = 5.82$, $p = .001$ | $\Delta R^2 = .001$ $F_{(1,623)} = 0.49$, $p = .486$ | $\Delta R^2 = .032$ $F_{(1,622)} = 23.17$, $p < .001$ |
| Total $R^2$ of the model | $R^2 = .070$ $F_{(2,627)} = 23.44$, $p < .001$ | $R^2 = .095$ $F_{(5,624)} = 13.09$, $p < .001$ | $R^2 = .096$ $F_{(6,623)} = 1.98$, $p < .001$ | $R^2 = .128$ $F_{(7,622)} = 13.05$, $p < .001$ |

*Note.* $N = 630$.
* $p < .05$.
** $p < .01$.

### 3.1. Method

#### 3.1.1. Participants and procedure

We conducted Study 2 on 402 SNSs users[1]: 258 (69.4%) women and 123 (30.6%) men. Mean age of participants was $M_{age} = 39.40$ years ($SD = 13.92$). Similar to Study 1, the sample size was not determined a priori, so we conducted sensitivity power analysis. With $\alpha = .05$ set as a significance threshold, and desired power set as .80, this sample was sufficient to detect effects of $r = .14$ for zero-order correlations, and Cohen's $f^2 = .019$ for single coefficients in multiple regression. Data was collected in April 2019 via Ariadna nationwide online survey panel. Scales were administered in separate random order for each participant. Participation in the study was anonymous, and no material rewards were offered.

#### 3.1.2. Instruments

In Study 2, we used the same instruments to measure SNS addiction (BSMAS), communal narcissism (CNI), and self-esteem (1-item instrument based on WHO-QOL BREF). However, we used an alternative measure of admirative and rivalrous narcissism: Narcissistic Admiration and Rivalry Questionnaire (Back et al., 2013; Polish adaptation (Rogoza et al., 2016). It includes 18 items, nine measuring admiration (e.g., "I deserve to be seen as a great personality") and nine measuring rivalry (e.g., "I want my rivals to fail"). In both, participants responded using a 7-point scale, ranging from *strongly disagree* (1) to *strongly agree* (7). Item scores of each were averaged (after reversing scores where necessary) to create indexes of admiration and rivalry.

### 3.2. Results and discussion

Table 3 presents mean scores, standard deviations, percentages, and correlation coefficients of the Study 2 variables. Similar to Study 1, SNS addiction was related negatively to age and was higher among women. Also replicating Study 1, it was positively related to rivalrous narcissism and negatively to self-esteem. Contrary to Study 1 results, it was not related to admirative narcissism; however, it was positively linked to communal narcissism in this Study.

To examine the unique effects of admirative, rivalrous, and

[1] As a part of a different project, all participants declared being in a romantic relationship at the time of data collection.

**Table 3**
Means, standard deviations, and correlations with confidence intervals (Study 2)

| Variable | *M* | *SD* | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|
| 1. Age | 39.40 | 13.92 | | | | | | |
| 2. Gender: men | 3.6% men | | −.24** [.15, .33] | | | | | |
| 3. Admiration | 3.16 | 0.88 | .09 [−.01, .18] | .06 [−.04, .15] | | | | |
| 4. Rivalry | 2.33 | 0.85 | −.07 [−.17, .02] | .16** [.07, .26] | .23** [.13, .32] | | | |
| 5. Communal Narcissism | 3.84 | 1.08 | .07 [−.03, .17] | −.02 [−.12, .07] | .61** [.54, .67] | .01 [−.09, .11] | | |
| 6. Self-esteem | 5.92 | 1.88 | .12* [.03, .22] | .10* [.00, .20] | .39** [.30, .47] | −.17** [−.26, −.07] | .35** [.26, .43] | |
| 7. SNS addiction | 2.36 | 0.86 | −.16** [−.25, −.06] | −.22** [−.31, −.12] | .09 [−.01, .18] | .15** [.05, .24] | .16** [.06, .25] | −.12* [−.22, −.02] |

* $p < .05$.
** $p < .01$.

communal narcissism on SNS addiction, thus replicating the results of Study 1, we tested the same model using hierarchical multiple regression analysis. Specifically, we entered age and gender in Step 1. In Step 2, we entered admiration and rivalry. Further, we entered communal narcissism in Step 3 and self-esteem in Step 4. Details of regression analyses are presented in Table 4.

Study 1 results were replicated only for gender and self-esteem. Reflecting assumed generational differences, age was negatively related to SNS addiction in all steps of the analysis. Admirative narcissism was not related to SNS addiction independently of other studied variables. Rivalrous narcissism was a robust and independent predictor of SNS addiction, also over and above self-esteem. Contrary to Study 1, communal narcissism was significantly (and positively) related to SNS addiction, independently from demographics, other narcissism aspects, and self-esteem. Although the relative role of assumed predictors is different, the overall predictive utility of the model is similar to Study 1 (11.5/13.0% and 12.8% of explained variance, respectively).

## 4. Study 3

Given the inconsistent results of Studies 1 and 2, we conducted Study 3, which was aimed to examine which of previously found effects are replicable. Moreover, to empirically test the independent effects of all four narcissism aspects on SNS addiction, in Study 3, we also included vulnerable narcissism in the model.

### 4.1. Method

#### 4.1.1. Participants and procedure

We conducted Study 3 on 608 SNSs users: 347 (57.1%) women and 261 (42.9%) men. Mean age of participants was $M_{age} = 43.90$ years ($SD = 15.51$). As the sample size was not determined a priori, so we conducted sensitivity power analysis. With $\alpha = .05$ set as a significance threshold, and desired power set as .80, this sample was sufficient to detect effects of $r = .12$ for zero-order correlations, and Cohen's $f^2 = .013$ for single coefficients in multiple regression. Data was collected in June 2019 via Ariadna nationwide online survey panel, similarly to Study 2.

#### 4.1.2. Instruments

We measured admirative narcissism, rivalrous narcissism, communal narcissism, and self-esteem with the same measures as in Study 2. Vulnerable narcissism was measured using the Narcissistic Vulnerability Scale (Crowe et al., 2018; Polish adaptation Sękowski et al., 2021), in which respondents indicate how well each of 11 adjective-based items (e.g., *underestimated*, *ashamed*) describe them "in general", using response scale ranging from 1 = *Not at all* to 7 = *Extremely*. Responses from all items were averaged to create the index of vulnerable narcissism.

**Table 4**
Hierarchical multiple regression analysis, in which SNS addiction was the dependent variable (Study 2)

| | Step 1 | Step 2 | Step 3 | Step 4 |
|---|---|---|---|---|
| | β | β | β | β |
| Age | −.11* [−.21, −.02] | −.10* [−.20, −.01] | −.10* [−.20, −.01] | −.10* [−.19, −.01] |
| Gender: men | −.19** [−.29, −.09] | −.23** [−.32, −.13] | −.22** [−.32, −.12] | −.20** [−.30, −.10] |
| Admiration | | .07 [−.02, .17] | −.04 [−.17, .08] | .01 [−.12, .13] |
| Rivalry | | .16** [−.06, .26] | .18** [.08, .28] | .15** [.05, .25] |
| Communal Narcissism | | | .18** [.06, .30] | .20** [.08, .32] |
| Self-esteem | | | | −.14* [−.24, −.03] |
| $R^2$ increase | | $\Delta R^2 = .035$ $F_{(2,397)} = 7.71$, $p = .001$ | $\Delta R^2 = .020$ $F_{(1,396)} = 9.11$, $p = .003$ | $\Delta R^2 = .014$ $F_{(1,395)} = 6.37$, $p = .012$ |
| Total $R^2$ of the model | $R^2 = .060$ $F_{(2,399)} = 12.76$, $p < .001$ | $R^2 = .095$ $F_{(4,397)} = 1.45$, $p < .001$ | $R^2 = .116$ $F_{(5,396)} = 1.35$, $p < .001$ | $R^2 = .130$ $F_{(6,395)} = 9.80$, $p < .001$ |

*Note.* $N = 402$.
* $p < .05$.
** $p < .01$.

### 4.2. Results and discussion

Table 5 presents mean scores, standard deviations, percentages, and correlation coefficients of the Study 3 variables. Similar to Studies 1 and 2, SNS addiction was related negatively to age, positively to rivalrous narcissism, and was higher among women. Congruent with Study 1 (but not Study 2), it was positively related to admirative narcissism, while congruent with Study 2 (but not Study 1), it was positively related to communal narcissism. As expected, it was also related positively to vulnerable narcissism.

To cross-validate the results of Study 2, we tested the same model in Study 3 (Table 6, Model 1). Further, to examine the unique effect of vulnerable narcissism, we tested a similar model of hierarchical multiple regression, only with vulnerable narcissism entered into it prior to self-esteem (Table 6, Model 2). Specifically, we entered age and gender in Step 1, admiration and rivalry in Step 2, communal narcissism in Step 3, vulnerable narcissism in Step 4, and controlled self-esteem in Step 5.

We replicated Study 2 results, showing that age, gender, rivalrous narcissism, communal narcissism, and self-esteem were independent predictors of SNS addiction. However, two differences were found. Firstly, the effect of admirative narcissism was insignificant only after the communal one was controlled. Secondly, the model explained more SNS addiction variance than in the previous studies: 20.0%. Additionally, vulnerable narcissism and self-esteem were linked to SNS addiction independently. Although the risk of SNS addiction was conceptualized as compensation for poor social skills in both cases (Brailovskaia et al., 2020), this result indicates that there might be a specific mechanism related to narcissistic vulnerability not explained by low self-esteem. Finally, antagonism, reflected in greater levels of rivalrous narcissism, might be a risk factor for SNS addiction not explained by vulnerability, grandiosity, or low self-esteem.

## 5. General discussion

We argued that the mechanism related to the addictive use of SNSs might be based on seeking specific gratifications related to different narcissistic motives. In the case of admirative and communal aspects of narcissism, it could be gaining ego-boosting positive feedback motivated by self-enhancement. In the case of rivalrous and vulnerable aspects of narcissism, it could be ego-protective avoidance of negative feedback motivated by self-protection. We also explored the role of the domain of self-enhancement (i.e., agency vs. communion) and means of handling ego-threats (i.e., avoidance in case of vulnerable narcissism vs. seeking dominance in case of rivalrous narcissism). Therefore, we examined the independence of four narcissism aspects in predicting levels of SNS addiction. Below, we discuss the results concerning each of them.

### 5.1. Admirative narcissism is not an independent predictor of SNS addiction

Our assumption that admirative narcissism is related to SNS addiction was confirmed partially. Although this relationship was found in Studies 1 and 3, it was independent only in the students' sample, only in one aspect (grandiose exhibitionism), and this effect was weak. Given that admirative narcissism was not uniquely related to SNS addiction in the two subsequent studies, we conclude that self-enhancement in the agentic domain might not be an independent predictor of SNS addiction. We propose two possible explanations for such a result. First, individuals high in admirative narcissism possess resources enabling them to self-promote "outside" SNSs, which might be more rewarding, especially for older individuals (Kuss & Griffiths, 2017). They can, but do not need to, realize narcissistic motives via SNSs; thus, those platforms are not as salient in their everyday lives, which is a prerequisite for addiction. Second, the SNSs might not be the optimal platform for solely agentic self-enhancement (as communal self-enhancement was controlled). Agentic traits are self-profitable, which means that they are profitable only for the possessor of the trait and thus are not primary in evaluations of others (Abele & Wojciszke, 2007). Therefore, as SNSs are predominantly used for social reasons (Jin, 2013), self-promotion in the agentic domain might not resonate with others and, in turn, not bring as many gratifications (e.g., likes, positive comments) as self-promotion in the communal domain.

### 5.2. Communal narcissism is an independent predictor of SNS addiction

We found that communal narcissism was positively and independently (of age, gender, self-esteem, and all other aspects of narcissism) related to SNS addiction. We argue that SNSs are useful platforms for self-promotion in the communion domain (especially in contrast to self-promotion in the agency domain) as SNSs are based on building and expanding social connections (Jin, 2013). Gaining social recognition (manifested by likes and positive comments from other users) might be highly rewarding for communal narcissists, validating their need for power and influence (Giacomin & Jordan, 2015). Moreover, online self-promotion might be based on information relatively unverifiable for the observer, giving the possibility of presenting an unrealistically communal image (e.g., virtue signaling, slacktivism). In that way, SNSs are a source of relatively low-cost gratifications in communal domain, which we believe to be a leading factor in increasing the risk of SNS addiction. However, communal narcissism is related to better psychological adjustment in general and resources to self-enhance "outside" SNSs, so it is a matter of future research what exactly is rewarding in SNS from the communal self-enhancement perspective.

**Table 5**
Means, standard deviations, and correlations with 95% confidence intervals (Study 3)

| Variable | *M* | *SD* | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|---|
| 1. Age | 43.90 | 15.51 | | | | | | | |
| 2. Gender: men | 43% men | 0.50 | .01 [−.07, .09] | | | | | | |
| 3. Admiration | 3.15 | 0.94 | −.06 [−.14, .02] | −.05 [−.13, .03] | | | | | |
| 4. Rivalry | 2.30 | 0.98 | −.16** [−.23, −.08] | .14** [.06, .21] | .41** [.34, .47] | | | | |
| 5. Communal Narcissism | 3.48 | 0.79 | −.07 [−.15, .01] | −.08* [−.16, −.00] | .56** [.50, .61] | .13** [.05, .20] | | | |
| 6. Vulnerable Narcissism | 3.27 | 0.94 | −.17** [−.25, −.09] | .01 [−.07, .09] | .03 [−.05, .11] | .44** [.38, .50] | .05 [−.03, .13] | | |
| 7. Self-esteem | 5.97 | 1.76 | .11** [.03, .19] | −.00 [−.08, .08] | .36** [.29, .43] | −.06 [−.14, .02] | .24** [.17, .32] | −.33** [−.40, −.26] | |
| 8. SNS addiction | 2.29 | 0.84 | −.22** [−.30, −.15] | −.14** [−.22, −.06] | .23** [.15, .30] | .22** [.15, .30] | .32** [.25, .39] | .24** [.16, .31] | −.07 [−.15, .01] |

* $p < .05$.
** $p < .01$.

**Table 6**
Hierarchical multiple regression analyses, in which SNS addiction was the dependent variable (Study 3)

| | Common for both models | | | Model 1 | Model 2 | |
|---|---|---|---|---|---|---|
| | Step 1 | Step 2 | Step 3 | Step 4 | Step 4 | Step 5 |
| | β | β | β | β | β | β |
| Age | −.22** [−.30, −.15] | −.19** [−.27, −.12] | −.18** [−.25, −.10] | −.16* [−.24, −.09] | −.16** [−.23, −.09] | −.15** [−.23, −.08] |
| Gender: men | −.14** [−.22, −.06] | −.15** [−.23, −.08] | −.14** [−.22, −.07] | −.14** [−.21, −.06] | −.13** [−.21, −.06] | −.13** [−.20, −.06] |
| Admiration | | .15** [.07, .23] | −.03 [−.12, .07] | .03 [−.07, .13] | .01 [−.08, .11] | .05 [−.06, .15] |
| Rivalry | | .16** [.07, .24] | .19** [.11, .27] | .16** [.08, .24] | .11* [.02, .20] | .10* [.01, .20] |
| Communal Narcissism | | | .29** [.20, .37] | .29** [.20, .38] | .27** [.18, .36] | .28** [.19, .36] |
| Vulnerable Narcissism | | | | | .15** [.07, .23] | .12** [.04, .21] |
| Self-esteem | | | | −.13* [−.21, −.05] | | −.09* [−.18, −.01] |
| $R^2$ increase | | $\Delta R^2 = .063$ $F_{(2,603)} = 21.91$, $p < .001$ | $\Delta R^2 = .055$ $F_{(1,602)} = 4.46$, $p < .001$ | $\Delta R^2 = .013$ $F_{(1,601)} = 9.56$, $p = .002$ | $\Delta R^2 = .017$ $F_{(1,601)} = 9.56$, $p < .001$ | $\Delta R^2 = .006$ $F_{(1,600)} = 9.56$, $p = .029$ |
| Total $R^2$ of the model | $R^2 = .069$ $F_{(2,605)} = 22.76$, $p < .001$ | $R^2 = .132$ $F_{(4,603)} = 23.01$, $p < .001$ | $R^2 = .187$ $F_{(5,602)} = 27.71$, $p < .001$ | $R^2 = .200$ $F_{(6,601)} = 25.01$, $p < .001$ | $R^2 = .204$ $F_{(6,601)} = 25.63$, $p < .001$ | $R^2 = .210$ $F_{(7,600)} = 22.79$, $p < .001$ |

*Note*. Two hierarchical models are presented. They differ only in Step 4 (and 5). Model 1 is a cross-validation of Study 2. Model 2 includes vulnerable narcissism (with self-esteem entered in the last step). $N = 608$.
* $p < .05$.
** $p < .01$.

### 5.3. Rivalrous narcissism is an independent predictor of SNS addiction

Rivalrous narcissism, as expected, was related positively to SNS addiction in all three studies. We interpret those results as a cue that there is a specific addictive mechanism based on self-protection (as self-enhancement was assessed by admirative and communal narcissism) but not characterized by avoidance (assessed by vulnerable narcissism). Based on structural characteristics of narcissism, placing its rivalrous aspect between vulnerable and admirative aspects (Crowe et al., 2019; Miller et al., 2015), we posit that this mechanism is a manifestation of antagonism. As expressions of antagonism are generally socially aversive (Abele & Wojciszke, 2007), it might be costly for rivalrous narcissists to maintain grandiose self via aggressive self-protection (e.g., striving for supremacy). Therefore, unlike admirative or communal narcissism, opportunities to realize narcissistic motives via antagonism without severe interpersonal costs are limited. From that perspective, SNSs might serve as a relatively low-cost (e.g., anonymity) environment for dysfunctional emotional regulation, which may lead to SNS addiction.

### 5.4. Vulnerable narcissism is an independent predictor of SNS addiction

Vulnerable narcissism was related positively to SNS addiction, and this relationship was independent of age, gender, other aspects of narcissism, and self-esteem. Although we expected it to predict SNS addiction independently from narcissism aspects reflecting self-enhancement (i.e., admirative and communal), we had no assumptions on the differentiation of narcissism aspects based on self-protection (i.e., rivalrous and vulnerable). The results indicate that, indeed, self-protection might be linked to SNS addiction not only by antagonism (reflected in rivalrous narcissism described above), but also by avoidance (reflected in vulnerable narcissism). Those results are in line with the theory of compensatory Internet use (Kardefelt-Winther, 2014). Vulnerable narcissists' fragility to possible ego-threats results in experienced difficulties in interpersonal relationships (Brailovskaia et al., 2020), such as others' approval dependence (Kanat-Maymon et al., 2018). Although they may find it increasingly difficult to use technology to expand their social networks meaningfully, the relative safety of controlled SNS interactions may serve them as a compensatory way of fulfilling social needs, and in turn, increase the risk of addiction.

### 5.5. Conclusions

Across three studies, we confirmed that narcissism is a personality-related risk factor of SNS addiction (Dalvi-Esfahani et al., 2019), showing that unraveling its complexity might be helpful, shedding light on the diversity of motives underlying the compulsive use of SNSs. Further, we replicated previous research concerning being women (Marino et al., 2018), younger age (Balcerowska et al., 2020), and lower self-esteem (Andreassen et al., 2017) as related to SNS addiction. This research allows us to draw three essential conclusions. First, the effects of all narcissism aspects were not confounded by self-esteem, which indicates their hierarchy-related nature (Mahadevan et al., 2019). Second, it was communal, not admirative narcissism, that was uniquely related to SNS addiction. If the ease of gaining gratifications on SNSs might lead to addictive use of them, then we posit that narcissism is related to seeking communal, not agentic rewards on SNSs. This might result from the social nature of SNSs themselves (Kuss & Griffiths, 2017), yet this issue needs further research. Third, both vulnerable and rivalrous aspects of narcissism were uniquely related to SNS addiction. Thus, we argue that SNS addiction may develop not only as a compensatory mechanism related to interpersonal sensitivity and poor social relations that prevents fragile self-views from threats (as indicated by vulnerable narcissism, see Brailovskaia et al., 2020), but also as a maladaptive self-regulation via antagonism and hostility towards others (as indicated by rivalrous narcissism). To sum up, further studies might benefit from acknowledging the heterogeneity of narcissism in examining its role in SNS addiction.

### 5.6. Limitations and future directions

One of the fundamental limitations of this study is its cross-sectional, self-reported character. Experimental and behavioral data is necessary to infer the causality between different narcissism aspects and SNS addiction. Further, given that narcissism and SNS addiction levels were relatively low in all our samples, the results are limited to the general

population. Thus, further studies examining the functioning of people characterized by clinical levels of narcissism (i.e., Narcissistic Personality Disorder) or SNS addiction are necessary. One of the most crucial limitations of the presented studies is that we speculatively argued on independent gratifying mechanisms for each examined narcissism aspect. To deepen the knowledge on SNS addiction, those mechanisms (and their independence) need to be tested empirically. For example, future studies might also consider the mediating role of different needs motivating SNSs use. Congruently, the investigation of the potential role of specific activities (i.e., passive vs. active users) in which narcissistic users engage on SNSs is needed. Finally, although we controlled gender, we did not argue on gender specificity in using the Internet. Men are more likely to experience Internet Gaming Disorder, and women are more likely to experience SNS addiction (Su et al., 2020), which suggests that people may become addicted to Internet activities through different pathways (Tang et al., 2017).

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## Ethics

Study 1 was approved by the Ethics Committee at the Institute of Psychology, University of Gdańsk; reference number: 15/2019. Study 2 was approved by the Ethics Committee at the Institute of Psychology, University of Gdańsk; reference number: 3/2021. Study 3 was approved by the Ethics Committee of Cardinal Stefan Wyszyński University in Warsaw; reference number: KEiB-32/2020. All studies were carried out in accordance with the Declaration of Helsinki. All gathered data was anonymous, and participants were informed about all the proper details about the study and their role in it, including that they can withdraw at any point. Attaining formal and written informed consent was not regarded as necessary as voluntary completion of the questionnaires was regarded as providing consent, and no medical information was gathered.

## CRediT authorship contribution statement

**Julia M. Balcerowska**: Conceptualization, Methodology, Investigation, Writing – Original Draft, Writing - Review & Editing, Project administration, Supervision. **Artur J. Sawicki**: Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Writing – Original Draft, Writing - Review & Editing, Visualisation, Funding acquisition, Supervision.

## Declaration of competing interest

The authors declare no conflict of interest.

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# Different aspects of narcissism and Social Networking Sites addiction in Poland and Germany: The mediating role of positive and negative reinforcement expectancies

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ABSTRACT

The present study aims to verify a part of the Interaction of Person-Affect-Cognition-Execution (I-PACE) model, indicating that personal vulnerability predisposing an individual to Social Networking Sites (SNS) addiction should be mediated by specific use expectancies. We focus on four aspects of narcissism (i.e., admirative, communal, rivalrous, and vulnerable narcissism), acknowledging that they might be associated with different narcissistic motives (i.e., self-enhancement or self-protection). We expect that the self-enhancement-based aspects of narcissism should be more strongly related to SNS addiction via positive reinforcement expectancies. In contrast, the self-protection-based aspects of narcissism should be more strongly related to SNS addiction via negative reinforcement expectancies. We test our hypothesis in Poland and Germany using self-report measures of narcissism, SNS use reinforcement expectancies, and SNS addiction (total N = 1946). The results indicate that all four aspects of narcissism (except communal narcissism in Poland) are positively related to SNS addiction. In a mediation analysis, the relationship between narcissism and SNS addiction is significantly more robust via negative reinforcement expectancies in both countries. Furthermore, positive reinforcement expectancies are not (Germany) or weakly (Poland) independently related to SNS addiction. Our research shows that narcissistic ego-protection might be more crucial than ego-boosting in explaining addictive SNS use.

## 1. Introduction

Many Internet users engage in intensive activity on Social Networking Sites (SNS), where they can create profiles and interact with others as part of daily routine. Popular examples of SNS, such as Facebook or Instagram, have billions of monthly active users worldwide (Statista, 2022). Previous research indicated that one of the harmful consequences of intensive use of SNS could be conceptualized as an addiction (Sun & Zhang, 2021). It has been argued that personality might be an important factor explaining why people engage in the addictive use of SNS (e.g., Atroszko et al., 2018). In the present study, we examine how various aspects of narcissism are related to SNS addiction and the mediating role of expectancies toward SNS.

### 1.1. Social Networking Sites addiction

SNS addiction refers to maladaptive SNS use that causes negative consequences for an individual and next of kin (Andreassen, 2015) and might be regarded as an example of behavioral addiction (Marino et al., 2018). The Interaction of the Person-Affect-Cognition-Execution (I-PACE) model of specific Internet-use disorders (Brand et al., 2016) and previous empirical investigations (e.g., Atroszko et al., 2018) have emphasized the role of predisposing factors (P-component) in developing and maintenance of addictive use of particular online applications. Some psychological factors could make Internet users more vulnerable to the maladaptive use of particular applications. The most consistent links to SNS addiction are neuroticism, self-esteem, conscientiousness (Marino et al., 2018), and narcissism (Casale & Banchi, 2020). According to the I-PACE model, a person-related predisposition

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may lead to cognitive (C-component) preoccupation reflected in maladaptive thoughts, cognitive biases, and expectations toward SNS use. These expectations may take two forms: expectancy that using an application could gain pleasure and positive emotions (i.e., positive reinforcement expectancies), and expectancy that using SNS enables one to avoid problems and reduce negative emotions (i.e., negative reinforcement expectancies). Both types of expectancies might increase the probability of using the application again. Therefore, reinforcement expectancies could mediate the relationship between personality characteristics such as narcissism and specific Internet-related disorders such as SNS addiction.

### 1.2. Narcissism and SNS addiction

Narcissism is defined as a personality trait characterized by a grandiose self, an exaggerated sense of uniqueness, and self-importance (Miller et al., 2021; Sedikides, 2021). Narcissism may manifest itself in grandiose and vulnerable form (Miller et al., 2021; Sedikides, 2021). Grandiose narcissism is characterized by high self-esteem, dominance, the tendency toward self-assuredness, and the need to be admired (Miller et al., 2011; Pincus et al., 2009). By contrast, vulnerable narcissism reflects defensiveness, low self-esteem, avoidance, and insecurity (Miller et al., 2011; Pincus et al., 2009). Furthermore, grandiose narcissism could be divided into self-enhancement (e.g., self-promotion) and self-protection (e.g., striving for dominance) aspects, which were labeled as narcissistic admiration (characterized by social boldness, exaggerated self-views, and feelings of superiority) and narcissistic rivalry (characterized by arrogance, devaluation of others, and a desire to see others fail; Back et al., 2013). Moreover, self-enhancement might be realized in two domains: agency and communion (Gebauer et al., 2012). In recent years, grandiose narcissism was also studied not only in an agentic, but also communal domain. Specifically, communal narcissism describes the tendency for self-enhancement of the attributes considered as communal, such as prosociality (Gebauer et al., 2012).

The extant research on the relationship between narcissism and SNS addiction focused on one aspect (i.e., grandiose) of narcissism or used the grandiose-vulnerable distinction (Casale & Banchi, 2020). Both grandiose and vulnerable aspects of narcissism are positively related to SNS addiction (Brailovskaia et al., 2020), suggesting that both self-enhancement and self-protection motives might contribute to addictive SNS use. First, SNS are convenient platforms for self-enhancement as ego-boosting positive feedback from other users satisfies the narcissistic need for social recognition (McCain & Campbell, 2018). Indeed, both admirative and communal narcissism are positively related to SNS addiction (Balcerowska & Sawicki, 2022). Second, SNS might be a safe environment where ego-threatening negative feedback can be avoided. Consistently, the aspects of narcissism related to self-protection strategies (i.e., vulnerable and rivalrous narcissism) also correlate with SNS addiction (Balcerowska & Sawicki, 2022). Although various aspects of narcissism have already been linked to SNS addiction, there is still a need to explore the potential mechanisms underlying these relations. We believe that the associations between specific aspects of narcissism and SNS addiction might be explained by two expectancies toward SNS use (i.e., positive reinforcement experiences and negative reinforcement expectancies) which correspond to two narcissistic motives (i.e., self-enhancement and self-protection; Balcerowska & Sawicki, 2022).

As both admirative narcissism and communal narcissism are based on the self-enhancement motive, they could be linked to the formulation of positive reinforcement expectancies of SNS use. Some preliminary findings of the putative mechanism have shown that the relationship between grandiose narcissism and SNS addiction was fully mediated by reward sensitivity (Lyvers et al., 2020). On the other hand, SNS use might be reinforced by the expectation of relief from negative emotions and interpersonal problems (negative reinforcement expectancies). This mechanism might be similar to that recently discovered in another specific Internet-related disorder where the link between vulnerable narcissism (but not grandiose) and problematic online gaming was mediated by emotion dysregulation and escapism (Di Blasi et al., 2020). Furthermore, reinforcement expectancies strengthened the relationship between interpersonal sensitivity and SNS addiction (Wegmann et al., 2015). This suggests that the aspects of narcissism related to self-protection motive (i.e., rivalrous and vulnerable narcissism) might be associated with the expectancy of relief from negative states or avoiding ego-treats and are linked to SNS addiction via negative reinforcement expectancies.

### 1.3. Current study

The current study has two aims. First, it aims to broaden the existing knowledge on the relationship between different aspects of narcissism and SNS addiction. As previous studies' results were insufficiently conclusive (Casale & Banchi, 2020), we decided to rely on the theoretical basis of the I-PACE model and capitalize on findings on different motives underlying narcissism and different reinforcement expectancies that may be put on SNS. We expect that the self-enhancement motive in narcissism should be positively related to positive reinforcement expectancies. In contrast, the self-protection motive in narcissism should be positively related to negative reinforcement expectancies. Second, in the field of SNS addiction studies, analysis that includes data from more than one country is still scarce. Therefore, our study aims to verify and empirically replicate the theoretical model (I-PACE) in two distinct countries, namely Poland and Germany. To the best of the authors' knowledge, this is the first study that placed the narcissism-SNS addiction link simultaneously in the reward-driven path (positive reinforcement expectancies) and compensation-seeking path (negative reinforcement expectancies) based on the two primary narcissistic motives.

We formulated several hypotheses. First, we hypothesized that all narcissism aspects (communal, admirative, rivalrous, vulnerable) would be positively related to SNS addiction (H1). Second, taking self-enhancement-based narcissism aspects, we expected that communal and admirative narcissism will be primarily associated with positive reinforcement expectancies, whereas rivalrous and vulnerable narcissism (i.e., self-protection motive) would be primarily associated with negative reinforcement expectancies (H2). Third, based on the I-PACE model, we hypothesized that positive expectancies of SNS use mediate mainly the link between communal and admirative narcissism and SNS addiction (positive reinforcement), whereas negative expectancies mediate mainly the associations between rivalrous and vulnerable narcissism and SNS addiction (negative reinforcement; H3).

## 2. Method

### 2.1. Participants and procedure

The data collection was conducted online in Germany and Poland. Before any calculations, based on two attention check items and gender other than men or women (as gender effect is analyzed later, we limit our inferences only to those two), we excluded 69 and 135 observations, respectively. After exclusions, the German sample consisted of 781 respondents (23 % men, $M_{age} = 25.71$, $SD_{age} = 8.47$, aged 18–86), and the Polish sample consisted of 1165 respondents (24 % men, $M_{age} = 24.79$, $SD_{age} = 7.47$, aged 18–59). The data assessment was anonymous, and participants received detailed information about the study before data collection. In the German sample, no material rewards were offered. In the Polish sample, participants were offered to participate in a lottery with a chance to win little gratification (i.e., a bookstore voucher worth PLN 50). For power analysis (thresholds of 0.80 for power and 0.05 for significance) we conducted a Monte Carlo simulation (Schoemann et al., 2017) setting the expected path effects to small (0.15). Sample size of N = 543 is sufficient to detect such a mediation effect (0.0225); therefore, we conservatively oversampled.

### 2.2. Instruments

We used the same instruments in the native language for a given sample (i.e., Polish and German). For all scales, we calculated their indexes by averaging scores for all items. We reported their reliabilities in Table 1. A 6-point Likert-type response scale was used for all narcissism measures, ranging from *strongly disagree* (1) to *strongly agree* (6).

*Social Networking Sites Addiction* was measured with the Bergen Social Media Addiction Scale (BSMAS; Andreassen et al., 2016). It contains six items with a response scale ranging from *very rarely* (1) to *very often* (5).

*Social Networking Sites Use Expectancies* were measured with a modified ("Internet" was replaced with "social networking sites") version of the Internet Use Expectancies Scale (IUES; Brand et al., 2014), assessing positive and avoidance expectancies, with four items each.

*Communal Narcissism* was measured with the 10-item Narcissistic Sanctity and Heroism Scale (NSHS; Żemojtel-Piotrowska et al., 2022). Although the instrument is primarily two-factorial, its overall score is a good indicator of communal narcissism (Żemojtel-Piotrowska et al., 2022).

*Admirative narcissism* was measured with the 3-item admiration subscale of the short version of the Narcissistic Admiration and Rivalry Questionnaire (NARQ; Back et al., 2013).

*Rivalrous Narcissism* was measured with two instruments: the 3-item rivalry subscale of the short version of Narcissistic Admiration and Rivalry Questionnaire described above and the 4-item enmity subscale of the short version of Vulnerable Isolation and Enmity Questionnaire (VIEQ; Rogoza et al., 2022). The first instrument grasps externalized antagonism, while the second instrument grasps internalized antagonism. Nonetheless, both are highly overlapping conceptually and empirically (Rogoza et al., 2022), measuring a construct of antagonism.

*Vulnerable narcissism* was measured using the 4-item isolation subscale of the short version of the Vulnerable Isolation and Enmity Questionnaire described above.

### 2.3. Statistical analyses

First, we checked the structural validity of all used measures with a series of Confirmatory Factor Analyses (CFAs) in both countries. We then tested measurement invariance in a series of Multigroup Confirmatory Factor Analyses (MGCFAs). Then, we saved group-invariant (latent) scores of MGCFA models for each observation and proceeded to hypotheses testing. We started with zero-order correlation analyses followed by their comparisons using Steiger's *z* tests. The mediation hypothesis was tested with Structural Equation Modeling (SEM). All details concerning factor analyses are reported in the Supplementary Materials, while all details concerning the analyses (e.g., codes) are available at https://osf.io/mqy3d/?view_only=a33a9ffbd1b242538e6b902707cfac13&fbclid=IwAR33boGemKPUxkEefbx3i5TYIc2gqQId_2F39vm85hXfGe0DmxR9s1Hmnis.

## 3. Results

### 3.1. Descriptive statistics and zero-order correlations

We present detailed descriptive statistics of all measured variables (reporting their average scores) in Table 1. Reliabilities of all used scales were adequate or good (all >0.70). Furthermore, all distributions were not substantially different than normal (based on kurtosis and skewness values), apart from rivalrous narcissism in Germany, which was slightly left-skewed and leptokurtic.

Prior to any statistical analyses, we confirmed the assumed structure of all used instruments and their cross-country measurement (metric) invariance, enabling us to compare correlational effects across countries (although models needed minor modifications, see Tables 1 and 2 in Supplementary Materials for details). In Table 2, we report zero-order correlation coefficients between all latent constructs and 95 % CI of those. In both countries, SNS addiction was correlated with gender (higher level among women) and negatively correlated with age. In the Polish sample, SNS addiction was positively related to all narcissism aspects, except the communal aspect. In the German sample, SNS addiction was positively related to all aspects of narcissism. Correlation coefficients comparison indicated that admirative narcissism was linked to positive reinforcement expectancies stronger than to negative reinforcement expectancies, but only in Poland. In both countries, rivalrous and vulnerable narcissism aspects were related stronger to negative reinforcement expectancies than to positive ones (see Supplementary Table 3 for details).

### 3.2. Mediation analysis

We relied on mediation analyses to test the hypotheses concerning the role of positive and negative reinforcement expectancies in the relationship between narcissism and SNS addiction. In the tested models (Fig. 1), we included examined narcissism aspect and two potentially confounding variables (gender, age) used as predictors (Xs), two reinforcement expectancies (positive and negative) used as simultaneous mediators (Ms), and SNS addiction as predicted outcome (Y). Given that factor analyses showed invariance only for modified models, we saved estimated factor scores in each of the CFAs to use them in the mediation tests. We did not conduct mediation analyses for communal narcissism since it was not linked to SNS use expectancies in Poland or Germany.

Positive reinforcement expectancies mediated the links between all three tested narcissism aspects (admirative, rivalrous, vulnerable) and SNS addiction but only in Poland. In Germany, positive reinforcement expectancies were not linked to SNS addiction (controlling for demographics and negative reinforcement expectancies). On the other hand, negative reinforcement expectancies were a robust predictor and a mediator between all three narcissism aspects and SNS addiction. Moreover, their effects (both direct and mediation) were stronger than those of positive expectancies. Basic information about the tested

**Table 1**
Descriptive statistics of measured constructs.

| | Polish sample | | | | | | | German sample | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *M* | *SD* | Min | Max | Skewness | Kurtosis | Alpha | *M* | *SD* | Min | Max | Skewness | Kurtosis | Alpha |
| Gender | 0.24 | – | – | – | – | – | – | 0.25 | – | – | – | – | – | – |
| Age | 24.98 | 7.43 | 18 | 59 | 1.86 | 3.25 | – | 25.71 | 8.18 | 18 | 86 | 3.01 | 10.69 | – |
| SNS addiction | 2.64 | 0.91 | 1 | 5 | 0.31 | −0.59 | 0.83 | 2.22 | 0.86 | 1 | 5 | 0.60 | −0.11 | 0.84 |
| Positive RE | 3.79 | 1.12 | 1 | 6 | −0.42 | −0.11 | 0.87 | 3.93 | 1.11 | 1 | 6 | 0.50 | 0.19 | 0.90 |
| Negative RE | 3.48 | 1.31 | 1 | 6 | −0.07 | −0.75 | 0.82 | 3.29 | 1.25 | 1 | 6 | 0.05 | −0.71 | 0.85 |
| Communal N | 3.4 | 0.77 | 1 | 5.8 | −0.10 | 0.26 | 0.85 | 3.19 | 0.85 | 1 | 6 | 0.10 | 0.01 | 0.86 |
| Admirative N | 2.65 | 1.14 | 1 | 6 | 0.36 | −0.37 | 0.80 | 2.45 | 1.15 | 1 | 5.67 | 0.49 | −0.58 | 0.82 |
| Rivalrous N | 2.43 | 0.87 | 1 | 5.54 | 0.46 | −0.13 | 0.77 | 1.79 | 0.77 | 1 | 5.46 | 1.50 | 2.73 | 0.81 |
| Vulnerable N | 3.36 | 1.18 | 1 | 6 | 0.07 | −0.61 | 0.79 | 2.70 | 1.18 | 1 | 6 | 0.35 | −0.70 | 0.78 |

Note. Polish sample: $n = 1165$, German sample: $n = 781$; Gender: mean score is the percentage of men in the Sample. RE = reinforcement expectancies, N = narcissism, SNS = Social Networking Sites; *M* = Mean, *SD* = standard deviation, Min = minimum, Max = maximum.

**Table 2**
Correlations of the investigated variables with 95 % confidence intervals.

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| 1. Gender: men | | 0.16** [0.09, 0.23] | −0.11** [−0.18, −0.04] | −0.08* [−0.15, −0.01] | −0.14** [−0.20, −0.07] | 0.00 [−0.07, 0.07] | 0.13** [0.07, 0.20] | 0.10** [0.03, 0.17] | −0.10** [−0.17, −0.03] |
| 2. Age | −0.10** [−0.16, −0.04] | | −0.21** [−0.28, −0.14] | −0.28** [−0.34, −0.21] | −0.29** [−0.35, −0.22] | −0.03 [−0.10, 0.04] | −0.05 [−0.12, 0.02] | −0.07 [−0.14, 0.00] | −0.13** [−0.19, −0.06] |
| 3. SNS addiction | −0.15** [−0.21, −0.10] | −0.16** [−0.21, −0.10] | | 0.40** [0.33, 0.45] | 0.61** [0.56, 0.65] | 0.15** [0.08, 0.22] | 0.27** [0.20, 0.33] | 0.41** [0.35, 0.46] | 0.39** [0.33, 0.45] |
| 4. Positive RE | −0.07* [−0.13, −0.01] | −0.20** [−0.25, −0.14] | 0.56** [0.52, 0.60] | | 0.67** [0.63, 0.71] | 0.06 [−0.01, 0.13] | 0.11** [0.04, 0.18] | 0.17** [0.11, 0.24] | 0.17** [0.10, 0.23] |
| 5. Negative RE | −0.13** [−0.19, −0.07] | −0.21** [−0.27, −0.16] | 0.67** [0.64, 0.70] | 0.77** [0.74, 0.79] | | 0.03 [−0.04, 0.10] | 0.10** [0.03, 0.17] | 0.28** [0.21, 0.34] | 0.33** [0.27, 0.39] |
| 6. Communal N | −0.01 [−0.06, 0.05] | 0.08** [0.02, 0.14] | 0.03 [−0.02, 0.09] | 0.05 [−0.00, 0.11] | 0.00 [−0.05, 0.06] | | 0.44** [0.39, 0.50] | 0.26** [0.20, 0.33] | 0.16** [0.09, 0.23] |
| 7. Admirative N | 0.15** [0.10, 0.21] | −0.11** [−0.17, −0.05] | 0.20** [0.14, 0.25] | 0.18** [0.12, 0.23] | 0.12** [0.07, 0.18] | 0.28** [0.23, 0.34] | | 0.66** [0.61, 0.69] | 0.24** [0.17, 0.30] |
| 8. Rivalrous N | 0.13** [0.07, 0.19] | −0.22** [−0.27, −0.16] | 0.32** [0.26, 0.37] | 0.26** [0.20, 0.31] | 0.34** [0.29, 0.39] | 0.04 [−0.02, 0.10] | 0.64** [0.61, 0.68] | | 0.74** [0.71, 0.77] |
| 9. Vulnerable N | −0.03 [−0.09, 0.02] | −0.24** [−0.30, −0.19] | 0.34** [0.29, 0.39] | 0.28** [0.23, 0.33] | 0.42** [0.37, 0.47] | −0.03 [−0.09, 0.03] | 0.18** [0.12, 0.24] | 0.75** [0.72, 0.77] | |

Note. The coefficients above the diagonal are based on the German sample ($n = 781$), while those below the diagonal are based on the Polish one ($n = 1165$). Gender: positive coefficients indicate higher scores for men. RE = reinforcement expectancies, N = narcissism; SNS = Social Networking Sites. * $p < .05$. ** $p < .01$.

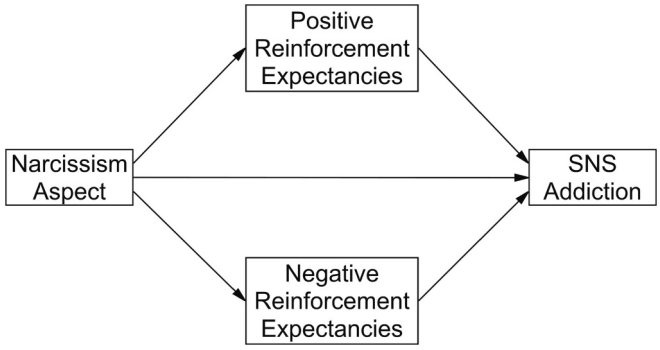


**Fig. 1.** Mediation models tested in the study.
Note. For clarity, covariates (gender, age) and residual correlations of mediators (reinforcement expectancies) are not depicted.

models is presented in Table 3. Detailed statistics are presented at https://osf.io/mqy3d/?view_only=a33a9ffbd1b242538e6b902707cfac13&fbclid=IwAR33boGemKPUxkEefbx3i5TYIc2gqQId_2F39vm85hXfGe0DmxR9s1Hmnis.

## 4. Discussion

In the present study, we examined the link between four aspects of narcissism and SNS addiction in two countries (i.e., Poland and Germany). We tested whether the underlying mechanism of this association might be explained by expecting specific gratifications from SNS use. We checked whether the relationship between self-enhancement-based aspects of narcissism and SNS addiction could be mainly explained by positive reinforcement expectancies, whereas negative reinforcement expectancies could mainly explain the relationship between self-protection-based aspects of narcissism and SNS addiction.

**Table 3**
Results of mediation analyses with 95 % confidence intervals.

| | Poland | Germany |
|---|---|---|
| Admirative narcissism | | |
| Direct effect | 0.13** [0.08, 0.17] | 0.22** [0.16, 0.28] |
| Indirect effect via positive expectancies | 0.02** [0.00, 0.03] | 0 [−0.01, 0.00] |
| Indirect effect via avoidance expectancies | 0.07** [0.04, 0.11] | 0.06** [0.02, 0.10] |
| Explained variance of SNS addiction ($R^2$) | 0.473 | 0.416 |
| Rivalrous narcissism | | |
| Direct effect | 0.12** [0.07, 0.17] | 0.24** [0.19, 0.30] |
| Indirect effect via positive expectancies | 0.02** [0.01, 0.04] | −0.01 [−0.02, 0.01] |
| Indirect effect via avoidance expectancies | 0.11** [0.08, 0.15] | 0.11** [0.06, 0.15] |
| Explained variance of SNS addiction ($R^2$) | 0.470 | 0.424 |
| Vulnerable narcissism | | |
| Direct effect | 0.08** [0.03, 0.12] | 0.21** [0.15, 0.27] |
| Indirect effect via positive expectancies | 0.03** [0.01, 0.05] | 0 [−0.01, 0.01] |
| Indirect effect via avoidance expectancies | 0.20** [0.17, 0.24] | 0.16** [0.11, 0.20] |
| Explained variance of SNS addiction ($R^2$) | 0.462 | 0.410 |

Note. Polish sample: $n = 1165$, German sample: $n = 781$; Standardized coefficients are presented; Gender and age were controlled in all analyses. SNS = Social Networking Sites.
* $p < .05$.
** $p < .01$.

### 4.1. Narcissism and SNS addiction – the role of specific reinforcement expectancies

All aspects of narcissism were positively associated with SNS addiction, except communal narcissism in Poland (H1 partially

confirmed). Those results correspond with previous findings pointing out that both self-enhancement and self-protection motives might contribute to addictive SNS use (Balcerowska & Sawicki, 2022). Therefore, the results align with the assumption that the mechanism linking narcissism to SNS addiction referred to self-regulatory processes concentrating on ego-related activities (Jauk & Dieterich, 2019). Nevertheless, considering the effect sizes of the relationships in both countries, self-protection-based aspects of narcissism (i.e., rivalrous and vulnerable narcissism) were stronger linked to addictive SNS use than self-enhancement-based aspects (i.e., admirative and communal narcissism). Therefore, when it comes to the problematic use of SNS, the maladaptive self-regulation based on avoidance of ego threats or seeking dominance toward others seems more relevant (Brailovskaia et al., 2020). Furthermore, the grandiose self-enhancement's domain-specificity remains inconclusive, as a positive link to communal narcissism in previous studies was found (Balcerowska & Sawicki, 2022). Nevertheless, previously studied populations were older than the present ones. Thus, the specificity of users' age group and related motives to self-enhance on SNS should be investigated as possible moderators in this relationship.

Our hypothesis regarding the correspondence of specific aspects of narcissism with reinforcement expectancies was partially confirmed (H2). Three aspects of narcissism (i.e., admirative, rivalrous, and vulnerable narcissism) were positively related to both positive and negative reinforcement expectancies. However, rivalrous and vulnerable narcissism (i.e., self-protection motive) were primarily associated with negative reinforcement expectancies in both countries and admirative narcissism was primarily related to positive reinforcement expectancies in Poland. Previous theoretical works pointed out that SNS use might trigger the tendency to compensate own deficits and/or satisfy specific needs (Kardefelt-Winther, 2014). In terms of narcissism, using SNS for compensation that reflects a coping strategy related to dealing with negative emotions and offline problems (especially for those aspects of narcissism based on self-protection motive) might be more important than searching for positive experiences on SNS. However, it should be mentioned that in the current study, positive reinforcement expectancies reflected the general assumption that SNS use could gain pleasure and positive emotions (Brand et al., 2014). Therefore, it does not capture narcissism-specific reward-seeking motives (e.g., showing one's best side or being better than others), which should be further investigated as more important correlates of narcissistic self-enhancement-related rewards on SNS.

Lastly, our assumptions regarding the mediation analysis which tested a part of the I-PACE model were partially confirmed (H3). In both countries, negative reinforcement expectancies mediate mainly the associations between SNS addiction and rivalrous narcissism, as well as vulnerable narcissism (self-protection motive) and the relationship between admirative narcissism (self-enhancement motive) and SNS addiction. Therefore, self-enhancement-based and self-protection-based aspects of narcissism were related to SNS addiction mainly via the expectancy that using SNS enables one to escape from reality and reduce negative emotions. Furthermore, as positive reinforcement expectancies were weakly or unrelated to SNS addiction, the reward-driven path of the narcissism-SNS addiction link was negligible in Poland and insignificant in Germany. This is in line with a recently published study pointing out that the relationship between narcissism and problematic SNS use is strengthened by emotional regulation problems (Hussain et al., 2021). In line with this, previous theoretical works that located narcissism-SNS addiction link primarily in the reward-driven path (Wegmann & Brand, 2019) should also consider the compensation-seeking path, especially for self-protection-based aspects of this trait. In previous studies, SNS use reinforcement expectancies as a mediating variable between personal vulnerability and SNS addiction were examined as one factor (e.g., Wegmann et al., 2015). Therefore, the relative role of positive and negative reinforcement expectancies in the SNS addiction perspective was not explicitly examined earlier. Nevertheless, following the updated I-PACE framework, self-enhancement and positive reinforcement expectancies could be essential factors in the early stages of addiction, leading to it rather than maintaining it (Brand et al., 2019).

### 4.2. Limitations and future directions

Further studies could examine factors related to the situational context of SNS use (e.g., ego-boosting and ego-protection behaviors) that might lead to maladaptive emotional regulation. Accordingly, experience sampling data hold huge potential for early identification and time-sensitive monitoring of the factors related to the situational context of SNS use. Second, the relatively young and mostly female composition of both samples limits the generalizability of present findings to the general population in Germany and Poland. We controlled for age and gender in the mediation analysis to tackle this limitation at least partly. Nevertheless, future studies should replicate our results in more age- and gender-balanced samples. We supplement our model with positive and negative expectancies as they are factors related to the positive and negative reinforcement mechanisms involved in the addiction process. Nevertheless, further investigation should consider more narcissism-specific reward mechanisms (e.g., being better than others, downward social comparisons, devaluation of others, and signaling extraordinary achievements or morality).

### 4.3. General conclusions

The presented study is the first to examine a wide range of aspects of trait narcissism as potential, independent risk factors of SNS addiction and tie them with SNS use reinforcement expectancies. Given that the explanations linking narcissism to SNS use were primarily based on the assumption that SNS are convenient platforms for ego-boosting activities (McCain & Campbell, 2018), our research puts the addiction perspective into emphasis, showing that narcissistic ego-protection might be as important as ego-boosting in SNS addiction research. Regarding narcissism as a personality risk factor, SNS addiction might be viewed not only as a result of a maladaptive gratification-seeking process but also as a compensatory strategy to cope with psychosocial stressors (Brailovskaia et al., 2020). Those results align with the framework of compensatory Internet use (Kardefelt-Winther, 2014), indicating that social inhibition and poor social relations of narcissistic individuals might lead to ego-protecting activities in case of social exposure and reducing negative emotions by engaging in excessive SNS use. Therefore, given that narcissism is explicitly mentioned as a psychosocial risk factor of addiction via reward-seeking behaviors (Wegmann & Brand, 2019), we posit that it could also predict addictive SNS use via fear-driven and compensation-seeking behaviors. In the clinical context, individuals with enhanced levels of narcissism could benefit from a controlled and conscious reduction of SNS use (see Brailovskaia et al., 2022). Furthermore, those individuals who suffer from narcissistic personality disorder should be screened for their daily time on SNS. If they engage in excessive use, modification of the online activity, as well as of the modification of the specific SNS use expectancies could be incorporated into the psychotherapeutic treatment.

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## Ethics

Study was approved by the Ethics Committee at the Institute of Psychology, University of Gdańsk; reference number: 6/2021. All studies were carried out in accordance with the Declaration of Helsinki. All gathered data was anonymous, and participants were informed

about all the proper details about the study and their role in it, including that they can withdraw at any point. Attaining formal and written informed consent was not regarded as necessary as voluntary completion of the questionnaires was regarded as providing consent, and no medical information was gathered.

## CRediT authorship contribution statement

**Julia Maria Balcerowska:** Conceptualization, Methodology, Investigation, Writing – original draft, Writing – review & editing, Project administration, Funding acquisition. **Artur Sawicki:** Conceptualization, Methodology, Formal analysis, Data curation, Writing – original draft, Writing – review & editing, Visualization. **Julia Brailovskaia:** Investigation, Writing – review & editing, Supervision. **Marcin Zajenkowski:** Conceptualization, Writing – review & editing, Supervision.

## Conflict of interest

The authors declare no conflict of interest.

## Data availability

Data will be made available on request.

## Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.paid.2023.112172.

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# Different aspects of narcissism and Social Networking Sites addiction in Poland and Germany: The mediating role of positive and negative reinforcement expectancies

Supplementary Materials

## 1. Confirmatory Factor Analyses (CFA) of used instruments across countries

We relied on standard thresholds of model fit (Brown, 2015; Byrne, 2013; Yuan & Bentler, 2008). If the model was not well-fitted, we allowed its modifications. Second, given that a cross-country comparison of correlational effects was needed to test the hypotheses, we checked the measurement invariance for all scales with a series of Multigroup Confirmatory Factor Analyses (MGCFAs). We compared the fit of the models assuming configural (i.e., the same factor structure in both groups), metric (i.e., equal factor loadings in both groups), and scalar (i.e., equal intercepts in both groups) invariance (Milfont & Fischer, 2010; Chen, 2007). Then, we saved group-invariant (latent) scores of MGCFA models for each observation and proceeded to hypotheses testing. The mediation hypothesis was tested with Structural Equation Modeling (SEM), in which we used the same strategy and fit criteria as in CFAs analyses. Full code and the list of packages used for analyses are available at https://osf.io/mqy3d/?view_only=a33a9ffbd1b242538e6b902707cfac13&fbclid=IwAR33boGemKPUxkEefbx3i5TYIc2gqQId_2F39vm85hXfGe0DmxR9s1Hmnis.

We tested whether all instruments' assumed factor structure fits our data. All of them fitted adequately in both countries, however, not without minor modifications. In the case of BSMAS, we relaxed constraints on items 1 and 2, and 4 and 6 (see Balcerowska et al., 2020 for rationale). In the case of two-factor IUES, we estimated two pairs of residual correlations: between items 1 and 5 (cross-factor), and 1 and 3 (within the same factor of positive expectancies). This modification was exploratory, given that the original instrument was

designed to measure expectancies towards Internet use, not specifically SNS. In contrast to the two-factor models of NARQ (we correlated residuals of items' 4 and 5, both measuring admirative narcissism) and VIEQ (items 3 and 5, both measuring vulnerable narcissism), the two-factor model of NSHS fitted well. In Table 1, we presented detailed results of default and modified models' estimation in both countries.

**Table 1**

*Results of Confirmatory Factor Analyses of Used Instruments*

| | | | German sample ($n$ = 781) | | | |
|---|---|---|---|---|---|---|
| Model | $\chi^2$ | df | CFI | RMSEA | RMSEA 95% CI | SRMR |
| BSMAS | 75.11 | 9 | .958 | .086 | [.068, .104] | .036 |
| BSMAS modified | 35.47 | 7 | .982 | .063 | [.042, .085] | .024 |
| RE | 448.39 | 19 | .883 | .151 | [.139, .163] | .063 |
| RE modified | 87.18 | 17 | .981 | .065 | [.051, .079] | .037 |
| NSHS | 266.29 | 34 | .912 | .090 | [.080, .100] | .056 |
| NSHS 2-factor | 103.45 | 19 | .956 | .073 | [.060, .087] | .040 |
| NARQ | 31.22 | 8 | .985 | .050 | [.030, .070] | .031 |
| NARQ modified | 30.80 | 7 | .984 | .054 | [.034, .076] | .030 |
| VIEQ | 124.80 | 19 | .939 | .068 | [.057, .081] | .050 |
| VIEQ modified | 95.84 | 18 | .955 | .060 | [.048, .073] | .043 |
| | | | Polish sample ($n$ = 1.165) | | | |
| Model | $\chi^2$ | df | CFI | RMSEA | RMSEA 95% CI | SRMR |
| BSMAS | 228.59 | 9 | .902 | .136 | [.121, .151] | .059 |
| BSMAS modified | 44.15 | 7 | .984 | .063 | [.046, .082] | .025 |
| RE | 307.32 | 19 | .937 | .101 | [.091, .111] | .048 |
| RE modified | 97.74 | 17 | .983 | .056 | [.045, .067] | .028 |
| NSHS | 301.65 | 34 | .929 | .071 | [.064, .079] | .047 |
| NSHS 2 factor | 145.54 | 19 | .955 | .065 | [.055, .075] | .037 |
| NARQ | 112.01 | 8 | .947 | .090 | [.075, .105] | .046 |
| NARQ modified | 36.98 | 7 | .986 | .049 | [.033, .066] | .026 |
| VIEQ | 235.87 | 19 | .914 | .088 | [.078, .099] | .056 |
| VIEQ modified | 161.45 | 18 | .943 | .074 | [.063, .084] | .043 |

*Note*. BSMAS = Bergen Social Media Scale Addiction Scale, RE= Reinforcement Expectancies , NSHS = Narcissistic Sanctity and Heroism Scale, NARQ = Narcissistic Admiration and Rivalry Questionnaire, VIEQ = Vulnerable Isolation and Enmity Questionnaire

## 2. Cross-country Multigroup Confirmatory Factor Analysis (MGCFA)

For a trustworthy cross-country comparison of study results, measurement invariance is necessary (Milfont & Fischer, 2010). Therefore, we conducted Multigroup Confirmatory Factor Analysis using previously established modified models. As hypotheses are correlational, the measurement needed to be cross-country invariant on at least metric level. The data met this requirement. Moreover, reinforcement expectancies were scalar invariant, enabling us to compare their levels, not only correlation coefficients. We presented detailed results of MGCFA in Table 2.

**Table 2**

*Results of Cross-country Measurement Invariance Analyses*

| Model | Level of invariance | $\chi^2$ | df | CFI | RMSEA | RMSEA 95% CI | SRMR |
|---|---|---|---|---|---|---|---|
| BSMAS | Configural | 79.61 | 14 | .983 | .063 | [.049, .077] | .022 |
| | Metric | 121.38 | 19 | .973 | .068 | [.057, .080] | .047 |
| | Scalar | 535.36 | 24 | .856 | .139 | [.129, .150] | .100 |
| RE | Configural | 184.92 | 34 | .982 | .060 | [.051, .069] | .029 |
| | Metric | 221.70 | 40 | .977 | .061 | [.053, .069] | .043 |
| | Scalar | 299.15 | 46 | .967 | .068 | [.061, .076] | .049 |
| NSHS | Configural | 567.94 | 68 | .922 | .079 | [.073, .085] | .047 |
| | Metric | 602.92 | 76 | .917 | .077 | [.071, .083] | .055 |
| | Scalar | 1415.60 | 84 | .783 | .118 | [.113, .124] | .088 |
| NARQ | Configural | 67.78 | 14 | .986 | .051 | [.038, .065] | .025 |
| | Metric | 89.66 | 18 | .981 | .054 | [.042, .066] | .036 |
| | Scalar | 439.92 | 22 | .882 | .124 | [.114, .134] | .087 |
| VIEQ | Configural | 257.28 | 36 | .948 | .068 | [.060, .076] | .039 |
| | Metric | 277.33 | 42 | .946 | .064 | [.056. .071] | .045 |
| | Scalar | 451.88 | 48 | .904 | .080 | [.073, .087] | .061 |

*Note.* We used modified models of the tools in the MGCFA. BSMAS = Bergen Social Media Scale Addiction Scale, RE= Reinforcement Expectancies, NSHS = Narcissistic Sanctity and Heroism Scale, NARQ = Narcissistic Admiration and Rivalry Questionnaire, VIEC = Vulnerable Isolation and Enmity Questionnaire

## 3. Correlation coefficient comparisons

**Table 3**

*Correlation coefficient comparisons*

| Narcissism aspect | Positive expectancies | Negative expectancies | *Z* | *p* |
|---|---|---|---|---|
| | | Poland | | |
| Admirative | .18 | .12 | 3.06 | .002 |
| Communal | .05 | .00 | 2.51 | .012 |
| Rivalrous | .26 | .34 | -4.24 | < .001 |
| Vulnerable | .28 | .42 | -7.59 | < .001 |
| | | Germany | | |
| Admirative | .11 | .10 | 0.35 | .730 |
| Communal | .06 | .03 | 1.03 | .302 |
| Rivalrous | .17 | .28 | -3.90 | < .001 |
| Vulnerable | .17 | .33 | -5.72 | < .001 |

*Note.* We used two-sided Steiger's dependent coefficients z-test relying on the "cocor" package