## EÖTVÖS LORÁND UNIVERSITY FACULTY OF EDUCATION AND PSYCHOLOGY

### **PHD** Thesis Booklet

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# Narcissism and self-esteem dynamics – towards a process-based conceptualization

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#### Introduction

Narcissism is one of the oldest constructs in psychology, and it is still one of the most debated ones. In recent years substantial progress has been made in both measurement, conceptualization, and methodology (Miller, Back, Lynam & Wright, 2021), however several questions remained unanswered. The lack of consistency between clinical theoretical models and trait-based conceptualizations, the lack of understanding of the underlying processes that lead to narcissistic functioning or the dominant view of narcissism as a stable trait are all areas where further development is needed (Edershile & Wright, 2022).

In the first part of this dissertation, we aim to summarize the current knowledge on narcissism putting emphasis on its hierarchical structure, correlates and measurement while also highlighting the consequences of narcissistic functioning on other areas of personality functioning. On the second part my emphasis shifts from the trait perspective of narcissism to the underlying processes that lead to the dynamics of narcissistic functioning.

#### I. PART – Current view on narcissism

There is an ongoing debate about which characteristics are central to narcissism (Miller et al., 2017), as former conceptualizations were mainly identifying narcissism with phenotypic grandiose manifestations e.g., the 3<sup>rd</sup> edition of the Diagnostic Statistical Manual of the American Psychiatric Association (DSM-III; APA, 1980) and measurement also was considering mostly grandiosity elements (e.g. the widely used Narcissistic Personality Inventory, Raskin & Terry, 1988; Donnellan, Ackerman & Wright, 2021). In contemporary research, narcissistic behaviors can be categorized into at least two broader subtypes, namely grandiose and vulnerable narcissism, each having different nomological networks (Wink, 1996; Pincus & Lukowitsky, 2010; Miller et al., 2011; Miller et al., 2021). Individuals with grandiose narcissistic traits are described as arrogant, exploitative, and entitled (Cain, Pincus & Ansell., 2008), and they often engage in self-aggrandizement, self-promotion, and devaluation of others (Miller, Lynam & Hyatt, 2017; Zeigler-Hill, Clark, & Pickard, 2008). By contrast, vulnerable narcissism is characterized by contingent self-esteem, self-inhibition, and substantial reliance on the approval of others for feelings of self-worth (Cain et al., 2008; Zeigler-Hill et al., 2008). At the same time, these individuals also hold grandiose expectations of oneself and others (Wink, 1996; Kealy & Rasmussen, 2012) to avoid feelings of embarrassment and shame (Edershile et al., 2019).

It is also important to differentiate between the view of subclinical versus clinical / pathological narcissism. In personality and social psychological research narcissism is mostly understood as a stable trait, or individual difference which makes some people more "narcissistic" than others (Campbell & Miller, 2012). Therefore, research is rather focusing on the levels of narcissistic traits associated with other relevant measures.

Recently, more hierarchical models emerged, aiming to identify the core of these seemingly incoherent manifestations (Miller et al., 2021). For example, Krizan and Herlacehe (2018) defined *entitled self-importance* as the narcissistic core, when individuals view themselves as more deserving, important or special, while also considering their goals and needs as more important than others'. With this definition they aimed to clear the construct from previously incorporated additional attributes (e.g. ambition, leadership, secret insecurity etc.) and also differentiate narcissism from pure disagreeableness and hostility. As a second goal, they focused on the organization of narcissistic features identifying which aspects are central and which are peripherical.

As hierarchical models offer a more detailed view of attributes from a theoretical point of view, our first research topic in this dissertation was to empirically test possible hierarchical measurement models in widely used narcissism measures. Therefore, we chose the Narcissistic Personality Inventory (NPI; Raskin & Terry, 1988) as it is one of the most popular measurement tools of narcissistic grandiosity in social- and personality psychology research (Cain et al., 2008).

#### **Research Topic 1**

This instrument originally consists of 40 items, each item containing two statements, one representing the narcissistic response and the other representing the non-narcissistic one. Participants have to decide which of the two statements represents their inner experience (e.g. *"I can usually talk my way out of anything"* versus *"I try to accept the consequences of my behavior.*"). Trait grandiose narcissism score is calculated by summing the number of narcissistic responses chosen by the participant. As the force-choice response format of the NPI was questioned based on the unequal social desirability of specific statements (Wetzel et al., 2016), a single-stimulus response format also emerged, in which only the narcissistic statements are presented in either a dichotomous or a 5-point Likert scale (for more details on the differences in factor structures according to the response format see Ackerman, Donnellan, Roberts & Fraley, 2016).

Despite the dominance of the NPI in the measurement of grandiosity the factor structure of the measure is still debated. Raskin and Terry (1988) identified seven principal components in their original study, but due to the high correlations between them several other structures were recommended [e.g. a two-factor solution by Corry and colleagues (2008) or a three-factor solution by Ackerman et al. (2011)]. Previous research mainly tested models with primary factors, though to understand the possible uni- or multidimensionality of the Narcissistic Personality Inventory, hierarchical models within confirmatory factor analysis framework should be considered, especially as hierarchical models gain popularity in theory also. If we view narcissism as a dynamic self-regulatory process, all narcissistic traits or behaviours should have a common underlying aim of maintaining a positive self-view, questioning the dimensionality of the constructs used. It is of increasing interest to apply both second-order and bifactor models in personality research (Reise, 2012), in order to clarify the dimensionality questions of a given construct. In second-order models, the higher order factors are said to explain the correlation between the primary factors, while the bifactor model approach aims to differentiate the amount of variance explained by a single general factor and specific relevant factors. The other advantage of the bifactor approach is that specific and general factor's relationship with external variables can be captured separately (Reise et al., 2010).

As there was no clear agreement on the different factor structures, and higher order factor models were not or rarely tested previously, the first aim of our three studies in Research Topic 1 was to compare the competing measurement models with a series of confirmatory factor analyses (CFA) to identify the best fitting solution to our data collected with both the Hungarian and English versions of the NPI. The second aim was to test the concurrent validity and associations of the best fitting model in two sets of confirmatory factor analysis models with covariates including self-esteem, other measures of vulnerable and grandiose narcissistic traits and well-being measures.

#### Results of Research Topic 1

We pooled three convenience samples in the current study. Participants in the first sample (Sample 1) were 226 university students (76.5% women, mean age = 21.17; SD = 2.57) from a large university in Budapest; for the second (Sample 2; n=414) and third samples (Sample 3; n=152) 566 university students (76.9% women, mean age = 27.29; SD = 10.95) were recruited from a university in Pécs. We tested nine measurement models on the combined sample of the three subsamples, Sample 1, Sample 2 and Sample 3 (N = 791).

Although more models offered acceptable fit according to current traditions, the bifactor model with three specific factors (Model 8) fitted best to the data ( $\chi^2$ =617.0, CFI=0.971, TLI=0.965, RMSEA= 0.044, CI [0.039-0.048]) compared to the competing solutions: all items loaded significantly on the general narcissism factor, although three items produced lower factor loadings than the recommendations of Tabachnick and Fidell (2014), where .32 can be considered as a cut-off value for poor factor loadings. These three items were item 19, 26 and 14 with factor loadings ranging from .27 to .31 on the General factor. These items however, higher loadings for the specific factors Grandiose Exhibitionism had and Entitlement/Exploitativeness ranging from 0.37 to 0.58. Two items in Model 8 (Items 32 and 34) did not load significantly on the specific factors both rather representing a global narcissism factor.

We estimated common variance index in the models and found that the global narcissism factor explains 53.5% of the common variance in the bifactor model with three specific factors, therefore a meaningful global factor seems to be present. The explained variances of the specific factors were ranging from 6% to 18.7%. Therefore, we can conclude, that this General factor plays the most important role in interpreting the results, while the specific factors have a substantially lower explanatory power, although a few items seem to reflect these specific factors to a greater extent. As the specific factors offered lower omega hierarchical coefficients (ranging from 0.23 to 0.41) than the recommendation of 0.5 from Reise and colleagues (2013) we can conclude that the specific factors need to be interpreted with caution in future research. The three-factor solution also have advantages from a theoretical perspective, because Grandiose Exhibitionism as a more adaptive facet of grandiose narcissisim is differentiated from Entitlement/Exploitativeness which is related to more maladaptive and socially challenging consequences.

Regarding convergent and discriminant validity of this measurement model, the general grandiose narcissism factor showed positive associations with other grandiosity measures, extraversion and self-esteem and negative associations with agreeableness and negative emotionality, which is in line with our expectations (e.g. Hyatt et al., 2018; Campbell et al., 2002) and support the validity of the bifactor model. On the other hand, the *Entitlement/Exploitativeness* specific factor was mostly responsible for positive associations with narcissistic vulnerability and negative emotionality. Therefore, the usage of the bifactor model might enable the separate measurement of narcissistic grandiosity apart from other aspects of narcissism.

Study 1 (N = 629)				
	General factor	Leadership/ Authority	Grandiose	Entitlement/
			exhibitionism	Exploitativeness
Sample 1 (N=215)				
Gender	-0.07	-0.13	0.01	0.23
Eudaimonic well- being	0.13	0.04	-0.17	0.05
Explicit self-esteem	0.27	-0.12	0.25	-0.36
R <sup>2</sup>	15%	2%	3%	19%
Sample 2 (N=414)				
Gender	0.20	-0.18	0.13	0.43
Vulnerable narcissism	-0.18	-0.19	0.03	0.11
		Study 2 (N = 319)		
	General factor	Leadership/ Authority	Grandiose	Entitlement/
			exhibitionism	Exploitativeness
Gender	-0.20	-0.01	0.23	0.23
PNI	0.32	-0.02	0.24	0.59
PNI Vulnerability factors	0.09	-0.07	0.13	0.53
PNI Grandiosity factors	0.55	-0.08	0.36	0.57
MCNS	0.15	-0.02	0.19	0.51
NVS	0.03	-0.07	0.05	0.36
NGS	0.54	0.30	0.43	0.16
Explicit self-esteem	0.11	0.27	0.39	-0.10
Study 3 (N=237)				
	General factor	Leadership/ Authority	Grandiose	Entitlement/
			exhibitionism	Exploitativeness
Extraversion	0.36	0.37	0.21	0.06
Agreeableness	-0.24	-0.10	-0.04	0.01
Conscientiousness	-0.06	0.20	-0.08	0.16
Negative emotionality	-0.24	-0.01	0.11	0.38
Open-mindedness	0.18	0.02	0.08	-0.02

*Table 1.* Correlates of the bifactor model of grandiose narcissism: confirmatory factor analyses with covariates (*Study 1, Study 2 and Study 3*)

*Note:* Boldfaced regression coefficients are significant at least p < .05. Each covariate is regressed separately in order to avoid the multicollinearity of covariates. PNI: Pathological Narcissism Inventory (Pincus et al., 2009); MCNS: Maladaptive Covert Narcissism Scale (Cheek, Hendin & Wink, 2013); NVS: Narcissistic Vulnerability Scale (Crowe et al., 2018); NGS: Narcissistic Grandiosity Scale (Crowe et al., 2016).

#### Conclusions of Research Topic 1

Despite the acceptable fit provided by bifactor models in general results should be interpreted with caution (Bonifay, Lane & Reise, 2017; Rodriguez et al., 2016). The two main concerns raised are that first, bifactor models tend to fit better to any possible data therefore can result in overfitting the studied model (Bonifay & Cai; 2017). Second, it might be hard to interpret what remains of a specific factor, after accounting for an orthogonal general factor (for details see Rodriguez et al., 2016). These are indeed serious concerns, however our aim with the present study was not only to report a well-fitting model, but to investigate to what degree does the NPI seem a multidimensional construct by nature. Our results suggest, that with relevant criterion

variables and other concurrent measures of narcissism our bifactor model showed wellinterpretable findings.

According to our findings, grandiose narcissism as a general factor accounts for at least half of the variance captured in the NPI while the role of specific factors remains limited. Therefore, the measurement of this general narcissism factor seems important when we would like to understand the associations with other psychological constructs. Based on our results the general narcissism factor and the relevant specific factors offered by Ackerman and his colleagues (2011) can be assessed using a shorter version of the NPI containing 25 items. Associations of these factors with other relevant variables seem to justify the validity of the bifactor model, although further research is needed to identify the associations with other relevant constructs, in other languages or other cultural settings. Moreover, further studies are needed to identify the role of the specific factors, namely what remains of these factors after the variance accounted for by the general grandiose narcissism factor is substracted and how these specific factors are related to other relevant psychological constructs.

#### II. PART – The dynamic interplay between processes of self-esteem and narcissism

Trait concepts offer a reliable and convenient way of conceptualizing and measuring narcissism through validated self-report measures of aggregated qualities however, this method tends to summarize underlying personality processes and only leaves us with assumptions regarding the real within-level dynamics (Edershile & Wright, 2022). Research suggested that considerable variability is shown in narcissistic tendencies (referred to as narcissistic states; e.g. Edershile et al., 2022) on the within-subject level (Edershile & Wright, 2021a, Giacomin & Jordan, 2016b), furthermore clinical observations and earlier theoretical models (e.g. the mask model) are often difficult to reconcile with actual data (Kuchynka & Bosson, 2018; Edershile & Wright, 2022).

To overcome these difficulties there is a growing body of literature focusing on narcissism as a complex system of several personality processes, in which phenotypic narcissistic manifestations can be best understood by disentangling the effects of these central and peripherical processes (Edershile & Wright, 2022). In the second part of this dissertation, narcissistic processes were conceptualized and measured in a naturalistic setting (for more details see Fleeson, 2001), which enables the observation of unfolding processes in everyday life. These studies usually measure shifts in narcissistic states of individuals throughout longer time periods (e.g. 10 days) with several measurements over a day. This longitudinal experience sampling methodology (for more details see Hektner et al., 2007) enables the distinction of variance in the within and between-subject levels and also allows the modelling of temporal

associations between variables (e.g. Edershile & Wright, 2021a). This methodology therefore enables the observation of narcissistic processes interacting within individuals through multiple measurement occasions (i.e. within subject effects), to measure how reactive these processes are to external circumstances (i.e. the contextual nature of narcissism) and to account for the possible variability in these processes in real-time. In this sense narcissism can indeed be observed as a dynamic self-regulatory process as originally proposed by Morf & Rhodewalt (2001), which provides not only a theoretical explanatory framework, but also enables empirical validation.

Therefore, the two following studies of this dissertation are presented in a complementary manner: first, a measurement tool was designed and validated, which enabled state-level assessment of narcissistic grandiosity and vulnerability (Research Topic 2). Second, temporal, and contemporaneous processes of narcissism and self-esteem were examined with also accounting for contextual factors coming from the everyday life of participants (Research Topic 3).

#### **Research Topic 2**

In Research Topic 2, we aimed to develop a state-level assessment tool derived from a wellknown inventory of vulnerable and grandiose narcissism (Pathological Narcissism Inventory, PNI; Pincus et al., 2009) to measure narcissistic states, which is necessary to study how and when the narcissistic process emerges. We assessed the psychometric properties, factor structure, discriminant and convergent validity of our tool focusing on momentary narcissistic behaviors. It consists of seven items, each representing one subfactor of the PNI based on psychometric and content-related considerations (for a review see Kruyen, Emons & Sijtsma, 2013), making it shorter than previously used measures (NGS and NVS; Edershile et al., 2019), assessing both vulnerable (four items) and grandiose (three items) narcissistic functioning.

Our samples were recruited from university students in the Netherlands (S1: n = 319, 73% female) and Hungary (S2: n = 236, 75% female; and S3: n = 123, 66% female). On S1 and S2 we assessed the convergent and discriminant validity of the measure with the currently used trait measurements of narcissism and self-esteem in a cross-sectional design. On S3, we tested its within- and between-subject level associations using structural equation modelling and multilevel models, based on an intensive longitudinal five-days long experience sampling method setting (15 data collection timepoints).

Results of Research Topic 2

According to our results the state version of the PNI (PNI-S) shares the common characteristics with other widespread measures of narcissism (see Table 2 for Intraclass Correlation Coefficients (ICC) averaged 0.73 for grandiosity and 0.97 for vulnerability factors) and external correlates (see Table 3 for associations of the PNI-S in a confirmatory factor analysis with covariates).

Table 2: Comparing the nomological networks of the PNI-S factors with intraclass correlation coefficients (ICC) in Sample 1.

	PNI-S Grandiosity	PNI-S Vulnerability		
	Intraclass correlation coefficient (ICC)			
PNI Grandiosity factor	.518			
NPI	.835			
NGS	.844			
PNI Vulnerability		.965		
factor				
MCNS		.978		
NVS	]	.968		

*Note:* PNI-S = Pathological Narcissism Inventory State Version; PNI = Pathological Narcissism Inventory; NPI = Narcissistic Personality Inventory; NGS = Narcissistic Grandiosity Scale; MCNS = Maladaptive Covert Narcissism Scale; NVS = Narcissistic Vulnerability Scale.

In order to perform CFA with covariates analysis, we estimated the model fit of the two-factor measurement model of *PNI-S* on S1. The results supported that the two-factor solution offers acceptable fit indices according to current traditions (RMSEA = .058; CFI = .961; TLI = .937;  $\chi^2$ = 374.6; df = 21; p<.001). Standardized factor loadings ranged from .53 to .79 for the vulnerability factor and .23 to .81 for the grandiosity factor. Grandiosity and vulnerability factors were moderately positively associated (.28).

Table 3. Associations of the PNI-S in Sample 1: confirmatory factor analysis with covariates.

	Vulnerable	Grandiose	
	narcissistic state	narcissistic state	Difference
			p*
Narcissistic Personality Inventory (NPI)	.05	.75	<.01
Pathological Narcissism Inventory (PNI)	.66	.43	<.01
PNI Grandiosity factors	.27	.68	<.01
PNI Vulnerability factors	.75	.24	<.01
Narcissistic Vulnerability Scale (NVS)	.72	.18	<.01
Narcissistic Grandiosity Scale (NGS)	05	.61	<.01
Maladaptive Covert Narcissism Scale (MCNS)	.63	.20	<.01

Rosenberg Self-Esteem Scale (RSES)	46	.15	<.01
State Self-Esteem (SSE)	44	.08	<.01

Note: N=319. Standardized coefficients. Boldfaced scores are significant at least p<.05. Each covariate is regressed separately to avoid the multicollinearity of covariates. \*Wald-test was used in comparison of  $\beta$ s.

To reflect on the main aim of the PNI-S in research using intensive longitudinal data, multilevel confirmatory factor analysis was also performed to differentiate the characteristics of the measure in both the within-subject and between-subject levels on S3. The multilevel CFA used 1741 observations and offered acceptable fit indices according to current traditions (RMSEA = .035; CFI = .938; TLI = .900;  $\chi^2$ = 960.2; df = 42; p<.001; SRMR <sub>within-subject</sub>= 0.035; SRMR<sub>between-subject</sub>= 0.093), factor loadings ranging from .44 to .67 on the within-subject level and .60 to .99 on the between-subject level. On the within-subject level the association between the grandiosity and vulnerability factors is weakly negative. (r = -.32). On the between subject level however, the association between the two factors is weakly positive (r = .26).

#### Conclusions of Research Topic 2

First, we conducted a multilevel confirmatory factor analysis to examine the fit of the twofactor solution in both the within- and the between-person level. Our results suggest that the scale performs well in both settings, the association between the grandiose and vulnerable states is negative on the within-subject level, while positive on the between-subject level. According to our explanation, vulnerable and grandiose narcissistic states can be associated as overall narcissistic tendencies or traits when we compare individuals [similar to the narcissistic core by Krizan and Herlache (2018)], however those states are not likely to be present at the same time as the result of an internal personality process. These findings highlight the importance of understanding the narcissistic process itself, not limited to the trait level of narcissism, as everyday functioning might be strongly affected by the internal personality process. This weak negative association should although be investigated further by future research.

The present study demonstrated the usefulness of the seven items long *Pathological Narcissism Inventory - State Version (PNI-S)*. This measure can perform better than original trait measures of grandiose and vulnerable narcissism (e.g. the NPI or the HSNS) in momentary data collection research where short and current state-related items are crucial in capturing internal states of personality processes. Compared to other currently used momentary measures the PNI-S can be applicable if the entitlement-related core of narcissism is also in focus besides vulnerability and exhibitionism/grandiosity (e.g. the NVS or the NGS) and if vulnerable aspects of narcissistic functioning is equally important in measurement. Furthermore, our results also highlighted the differences between the within- and between person associations, enabling us to take a closer look into the personality processes behind narcissistic functioning.

#### **Research Topic 3**

Building on the results of Research Topic 2, the PNI-S enables the further investigation of central processes of grandiose and vulnerable narcissism as states, with other important personality processes. In Research Topic 3, we aim to capture the associations of positive and negative self-esteem processes and narcissistic functioning.

The association between self-esteem and narcissism is well-documented in the trait perspective, furthermore these associations are mostly replicated in studies measuring state self-esteem (e.g. Edershile & Wright, 2021). On the other hand, state self-esteem is usually captured as a global tendency, measured only with positive items from the Rosenberg Self-Esteem Scale (Rosenberg, 1965), tailored for momentary assessment. In Research Topic 3 we argue that positive and negative self-esteem processes are not simply two sides of the same coin, but also operating separately to some extent. Differentiating positive and negative self-esteem processes was already proposed by Owens (1993, 1994) arguing that combining positive and negative self-evaluations (so-called self-deprication) in a single measure may hide important features of the self-esteem process. Even in terms of traits, low self-esteem appears to be more complex than being the opposite of high self-esteem (Rosenberg & Owens, 2001), as the low self-esteem cluster is closely related to other variables e.g., depression and anxiety. Moreover, clinical observations applying the mental states perspective also suggest, that high and low self-esteem states, or grandiose and vulnerable narcissistic states can oscillate or even co-occur (Levy, 2012).

Moving forward from the trait perspective, de Ruiter, van Geert & Kunnen (2017) offered a different theoretical background for understanding dynamic self-esteem processes. In the Self-Organizing Self-Esteem (SOSE) model the dynamic systems approach is applied (for more details see van Geert, 2011) which uses two terms to explain both stability, both variability in personality processes. Attractor states are higher-order patterns of cognitions, behaviours and affects that lead the current state of self-esteem to a previously established, coherent state built up from prior self-experiences. These attractor states are rather stable, and a person can reach them with a relatively little energy (e.g. effort, motivation or attention; Kunner & Van Geert, 2012) similar to practicing a habit rather than trying out a new set of behaviour (de Ruiter, van Geert & Kunnen, 2017). Different attractor states of self-esteem can be present at the same

system (for example a negative self-esteem attractor and a positive self-esteem attractor), which is called multistability in the SOSE model. The totality of all possible self-esteem states forms the attractor landscape of an individual's self-esteem. In this view state self-esteem can oscillate between different states, although it is easier (i.e. requiring less energy) to be attracted to a specific, well-established state, and the more one visits a particular attractor state, the deeper it becomes (i.e. the perspective of schema therapy, Young, Klosko & Weishaar, 2003). As an attractor state deepens, more and more energy is needed for the individual to leave it. Trait self-esteem therefore can be considered as an attractor landscape consisting of multiple states. If we average these distinct self-esteem states, we might also end up losing our ability to differentiate distinct processes. With this concept in mind our aim was matching positive and negative self-esteem processes with grandiose and vulnerable narcissistic states would be more closely related to positive self-esteem processes, while vulnerable narcissistic states are rather related to negative self-esteem processes.

Multistability in the SOSE model suggests, that more attractor states exist in the self-esteem attractor landscape, therefore more than one possible and stable state can attract momentary self-esteem. Moreover, several internal and external factors are influencing which state is activated in different situations. In the current study we aimed to account for the role of context (Edershile & Wright, 2022) of narcissism dynamics with capturing the daily positive and negative experiences of individuals in two main domains of personality functioning, agency, and communion. Agentic experiences refer to situations in connection with competence, assertiveness and decisiveness (how someone achieve goals) and communion, refers to social functioning and relationship maintenance (being helpful, trustworthy and benevolent; for a review see Abele & Wojciszke, 2014). From the point of view of the narcissistic process, positive events can help in reinforcing and maintaining the positive view of the self, while negative events can serve as ego-threats. Studying ego-threatening situations (when specific cues from the environment triggers the feeling of self-worth) has a long history in previous narcissism research (for a review see vanDellen, Campbell, Hoyle & Bradfield, 2010), either in agentic, or communal domains.

Although previous studies suggested the important role of self-esteem (trait, state, variability) processes in narcissism dynamics (Edershile & Wright, 2021a; Geukes et al., 2017) they either examined them separately from each other or mainly identified the variability of these measures, they did not address the interplay of internal processes (Edershile & Wright, 2021a). The aim of Research Topic 3 is to capture four distinct central processes of narcissistic

functioning, namely state-level positive and negative self-esteem and state-level grandiose and vulnerable narcissism while also considering the effect of context. Previous studies suggest that negative self-esteem processes and negative self-experiences can be associated with narcissistic vulnerability (when the grandiose self-image cannot be reached or validated by self or others), and positive self-esteem processes, positive self-experiences can be associated with narcissistic grandiosity (when the grandiose self-image can be reached or validated by self or others). Furthermore, our aim is to also capture the dynamic interplay of these processes in the everyday life of individuals.

#### Methods of Research Topic 3

Research Topic 3 consists of two largely identical studies (*Study 1*, n = 123, 66% female; *Study 2*, n = 109, 79% female) on university students from Hungary, the only difference being the usage of different measurement tools for narcissistic states (Pathological Narcissism Inventory – State Version (Engyel, de Ruiter & Urbán, 2022) in *Study 1* and the Narcissistic Grandiosity Scale (Crowe et al., 2016) and Narcissistic Vulnerability Scale (Crowe et al., 2018) in *Study 2*). Both studies applied a longitudinal experience sampling method setting, where participants had to complete four measurements per day for five consecutive days on their smartphones reporting on their narcissistic states, positive and negative state self-esteem (measured three times a day), and whether positive or negative performance or social related events happened to them during the day (measured once a day). This longitudinal setting enables the differentiation of within-subject (e.g. how state self-esteem and vulnerable narcissistic states are associated inside one person if we measure these variables multiple times) and betweensubject (e.g. how state self-esteem and vulnerable narcissistic states if we compare different individuals) level associations.

As the data from the five-day long studies had a multilevel structure (twenty observations nested within persons), multilevel vector autoregressive models (VAR1) were used in the dynamic structural equation modelling framework (DSEM) of Mplus 8.3 (McNeish & Hamaker, 2019). This method enables the integration of both SEM models and time-series analysis (Asparouhov, Hamaker & Muthén, 2018). Two types of models were used: first, we differentiated effects within a specific observation window (time t) using Residual DSEM (Model 1). This model enables us to model contemporaneous associations while differentiating the autoregressive part (i.e. the variable at time t-1 predicts the same variable at time t) from the structural part of the model (Asparouhov & Muthén, 2019). Second the lagged effects of time t-1 on time t (temporal associations) were modelled using a regular DSEM model (Model 2). This model helps us in

differentiating the associations between positive and negative state self-esteem and grandiose and vulnerable narcissistic states. This differentiation of the temporal and contemporaneous associations is common in studies using intensive longitudinal data (e.g. Kiekens et al., 2020).

#### Results and Conclusions of Research Topic 3

During the 5-day long ESM protocols a total of 2337 assessments were registered in *Study 1*, and 2035 assessments in *Study 2*. In accordance with our hypotheses, positive and negative state self-esteem showed only a weak negative relationship, and grandiose narcissistic state was more closely associated with positive state self-esteem than negative, although this difference was not meaningful in the association of negative state self-esteem and vulnerable narcissistic states (Table 4).

Table 4. Repeated measures correlations (Bakdash & Marusich, 2017) are presented above the diagonal (upper right) in Study 1 and below the diagonal (bottom left) in Study 2. Negative state self-esteem is not reversed-scored. Significant correlations are boldfaced (p<.001).

Within-subject	Repeated measures correlation matrix (r; within-				
variables	subject level) of the momentary variables				
	1.	2.	3.	4.	5.
1. Vulnerable	-	.03	40	30	.33
narcissistic state		p=.24	p<.001	p<.001	p<.001
2. Grandiose	26	-	.36	.44	13
narcissistic state	p<.001		p<.001	p<.001	p<.001
3. State self-esteem	43	.47	-	77	.81
	p<.001	p<.001		p<.001	p<.001
4. Positive state	35	.58	.79	-	25
self-esteem	p<.001	p<.001	p<.001		p<.001
5. Negative state	.34	19	82	30	-
self-esteem	p<.001	p<.001	p<.001	p<.001	

To capture the within-level dynamics of self-esteem and narcissistic processes we applied two separate models, one for capturing the contemporaneous effects controlling for the lagged effects of variables (residual DSEM model, Figure 1) and one for capturing the temporal effects affected by specific daily events as moderators (regular DSEM model, Figure 2). The contemporaneous effect can reflect on the dynamics inside a specific attractor state while the temporal associations help in capturing the temporal extent of an attractor state.



Study 1 (S1: n = 123) ; Study 2 (S2: n = 109)

Figure 1: Contemporaneous within-person associations between negative and positive state self-esteem and vulnerable and grandiose narcissistic states with lagged effects controlled for in a RDSEM model (Model 1).

Our results suggest, that within a specific time window negative state self-esteem (SSE) positively predicts vulnerable narcissistic states (VNS), while positive SSE is rather predicting a grandiose narcissistic state (GNS), although on Study 2 positive SSE was also predicting VNS negatively. From the perspective of the self-organizing self-esteem model (SOSE; de Ruiter, van Geert & Kunnen, 2017) we argue, that two different attractor states can be identified in self-esteem processes. The activation of the negative self-esteem attractor limits positive SSE and predicts a vulnerable narcissistic state, in which negative self-experiences are going to dominate (e.g. feeling not worthy enough, being incapable of achieving certain goals, etc.). On the other hand, the activation of the positive self-esteem attractor can predict a grandiose state with positive self-experiences (e.g. feeling special, getting validation or support for the grandiose self-image, etc.). This concept is largely in line with previous research suggesting the self-regulatory function of narcissistic tendencies (e.g. Morf & Rhodewalt, 2001) in maintaining a positive view of the self (i.e. closely associated processes). Moreover, differentiating grandiosity and vulnerability on a state-level as distinct attractors also reflects earlier clinical observations of possible flips between experiences of self-aggrandizement and self-loathing (Miller et al., 2007; Ronningstam, 2010).

#### Temporal associations of self-esteem and narcissistic functioning

In Model 2 (Figure 2) temporal associations of negative and positive SSE and narcissistic states were measured in a regular DSEM model. Lagged and cross-lagged associations (i.e. the effect of  $time_{t-1}$  variables on  $time_t$  variables) suggest, that some stability can be observed in every variable (lagged associations), and negative SSE in the preceding measurement also predicted current vulnerable narcissistic state. This result indicate that a negative SSE attractor state might affect the activation of the vulnerable narcissistic state and its effect might be even longer. A similar pattern between positive SSE and grandiosity cannot be observed in either of the studies.

Figure 2: Temporal associations between negative and positive state self-esteem and vulnerable and grandiose narcissistic states with a moderating effect of negative and positive life events in a DSEM framework (**Model 2**). Arrows represent significant standardized regression coefficients. Arrows with dashed lines and coefficients with non-black fonts indicate important non-significant tendencies.



Study 1 (S1: n = 123) ; Study 2 (S2: n = 109)

The moderating effect of daily positive and negative experiences was also considered in our studies. Daily negative experiences were significant moderators of the association between negative SSE and state vulnerability in both studies. This result indicates that for those, who experienced more negative daily events the negative SSE-vulnerability association was stronger. Positive events on the other hand had a more limited, not significant negative association with the negative SSE-vulnerability association and a positive association with the positive SSE-grandiosity association in *Study 1*, not replicated in *Study 2*. Daily events, measured in the current form produced considerably wider confidence intervals at least partly because they were measured only once a day, compared to momentary measurements of 15 occasions. Therefore, future research should apply a more nuanced view of momentary contextual differences.

Based on these results we argue that negative daily events (e.g. social rejection, failure in an achievement related task) might have a more robust effect on pushing the person to a negative SSE attractor state characterized by a mainly maladaptive vulnerable narcissistic coping, while positive daily events can partly compensate for those by affecting both negative and positive SSE processes.

All in all, we found support to the relevance of differentiating positive and negative self-esteem processes in measurement as they are associated distinctly to vulnerable and grandiose narcissistic states. Furthermore, the effect of daily positive and negative experiences might lead to different dynamic processes of self-esteem and narcissism, resulting in different momentary self-experiences.

#### Conclusions and implications for future research on narcissism dynamics

Despite the limitations of our studies – which are similar to other studies in the field (e.g. the reliance on university samples with a higher proportion of female participants and the use of self-report data) – we believe, that measuring narcissistic states and self-esteem processes in the everyday life of individuals with intensive longitudinal measurement can offer more detailed insights into how dynamics of narcissism emerge.

First and foremost, because we aim to measure the process itself, currently in operation: we assess the currently activated states, compared to how individuals evaluate, remember, or summarize their overall experiences in trait measurements. Although, as internal processes or shifts between specific attractor states (e.g. vulnerability, negative state self-esteem) might happen in the timeframe of minutes or seconds a closer and more specified temporal observation should be applied in future research. This way we limit the chances of missing important aspects and capturing only the end results of dynamic shifts (Edershile & Wright, 2022). In our view the reinvention of experimental methods could also hold promising results as we could limit the timeframe of naturalistic studies to specific relevant triggering events, therefore we could take a closer look at state-level changes (e.g. the effect of social rejection in state-level variables measured multiple times). Previous studies on ego-threatening situations (see vanDellen, Campbell, Hoyle & Bradfield, 2010) might offer a good starting point for conceptualizing triggering events (e.g. Mota et al., 2023; Rhodewalt et al., 1998; Weiss & Huppert, 2022).

We believe that our results are important in understanding state-level processes of narcissism and self-esteem, furthermore, they can also serve as a starting point for future research. We see our main contribution on the one hand related to offering methodological options with the validation of a measurement tool, and on the other hand, by applying the theoretical framework of complex dynamic systems. As the study of narcissism dynamics is still an emerging field, many questions remain open regarding its associations with other relevant personality processes or the identification of contextual factors that influence them.

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