

# Chapter 11

## The Elusive Quantification of Self-Esteem: Current Challenges and Future Directions



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### Introduction

The concept of self-esteem has been central in the social-psychological literature since the late eighteenth century and it can be arguably considered one of the most important constructs in psychology. A quick database search of PsychINFO reveals a striking 52,126 results in March 2020, and 53,248 results in October 2020, showing how central this topic was and still is (with an estimate increase of 2000 hits per year) for scientists and practitioners alike. William James introduced this topic more than one hundred years ago, and more recently Rhodewalt and Tragakis [1, p. 66] stated that self-esteem is one of the “top three covariates in personality and social psychology research”. Perhaps, the relevance of self-esteem can be easily understood if we consider that this construct is linked to all levels of human existence, from mental illness to mental wellbeing: indeed, on the one hand, low self-esteem is related to various mental disorders, such as depression and anxiety (e.g., [2–5]); on the other hand, high self-esteem is related to various proxies of mental wellbeing, such as success, happiness, agency, and motivation (e.g., [6–8]). It is therefore fundamental to understand what self-esteem is, how it is assessed, and why it is so important for people’s quality of life.

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K. Wac, S. Wulfovich (eds.), *Quantifying Quality of Life*, Health Informatics,  
[https://doi.org/10.1007/978-3-030-94212-0\\_11](https://doi.org/10.1007/978-3-030-94212-0_11)

## Definition of Self-Esteem

In a way, we all know what self-esteem “really is”: indeed, we can have a fairly good understanding of what is meant by self-esteem through introspection and observation of the behavior of others [9]. After all, self-esteem is a human phenomenon; yet, it is hard to put that understanding into precise words. In fact, as soon as we begin to examine self-esteem more closely, the understanding of this construct becomes quite problematic. The issue of defining self-esteem is crucial because definitions help shape what to focus on, which methods to choose and use, and what standards should be adopted to accept or reject evidence or conclusions [10]. Nevertheless, to find a concise and overarching definition of self-esteem is challenging because it encompasses different aspects and levels of analysis related to the context and its time stability or fluctuation. Self-esteem can be understood in terms of values (such as self-enhancement and openness to change values; [11]), feelings or affective dimensions (such as pride and shame; [12]), motivational (such as the desire to protect, maintain, and enhance feelings of self-worth; [13]), cognitive (such as evaluative components of self; [14]) and behavioral factors (such as being more independent or assertive, or more willing to exercise to gain fitness instead of reducing dissatisfaction with one’s body image; [6, 15, 16]).

Historically, self-esteem has been conceptualized in terms of (a) self-competence, or the ratio of a person’s successes over her failures in areas of life that are relevant to personal identity (dating back to William James work 1890/1983; James, Burkhardt, Bowers, Skrupskelis, and James, 1981; [17]) and (b) self-worth, or the affect concerning the degree to which one feels good about oneself [18]. Therefore, self-esteem is considered an evaluative psychological process that reflects both the extent to which people accept and like themselves, and believe they are competent (e.g., [19, 20]). Such evaluation can occur in relation of a specific point on time (state self-esteem) or as an overall and more stable evaluation of the self (global self-esteem). Scholars have suggested that this evaluation may involve the assessment of several dimensions of the self. For instance, Tatarodi and Swann [20, 21] suggested that self-esteem involves perceptions of self-worth (i.e., self-liking) and personal efficacy and self-regard of one’s capabilities (i.e., self-competence); or as suggested by O’Brien and Epstein [22], it encompasses several dimensions related to worthiness, competence, and global self-esteem.

Favorable views of the self, vs. evaluations of the self that are either uncertain or negative would then be the manifestations of high vs. low self-esteem, respectively [23]. It is relevant to note that self-esteem reflects subjective perceptions rather than objective reality, and therefore could be either accurate or not [24]. We suggest that, to fully understand self-esteem, it should be conceptualized in its social-psychological context. Therefore, we define self-esteem as *the extent to which one person accepts and likes herself (in a specific point on time or overall) according to socially and personally defined standards, as well as believes of being competent in specific areas of life which are relevant to her personal and social identity.*

To further corroborate this perspective, we should highlight that our definition is in line with sociometer theory [25], which basically consider self-esteem as the output of a psychological meter, or instrument, that monitors the quality of people's relationships with others [26]. This psychological instrument is used by the self to monitor and respond to threats to the basic need to belong—i.e., that innate human need to form and maintain at least a minimum quantity of interpersonal relationships [25]. What follows, is that the degree to which a person perceives others to regard their relationship with herself as valuable, important, or close—i.e., her own relational evaluation—might change in specific situations or through the lifespan. Accordingly, when a person's relational evaluation is changing, the sociometer puts her attention to the related social acceptance threat or reward and motivates her to deal with it. Thus, the sociometer output is the affectively-charged self-appraisal that we typically perceive as self-esteem [27]:

At its core, self-esteem is one's subjective appraisal of how one is faring with regard to being a valuable, viable, and sought-after member of the groups and relationships to which one belongs and aspires to belong. [26, p. 2]

This understanding of self-esteem appears coherent and comprehensive, as it can indeed explain why self-esteem is a relatively stable, but by no means immutable, psychological trait, as well as why it appears that self-esteem trait might have a specific trajectory across the individual's lifespan [28].

In light of the above-mentioned arguments, the assessment of self-esteem becomes a critical issue because it lies at the heart of empirical research. Accordingly, the focus of this chapter is to synthesize previous work detailing the assessment of self-esteem and to link this work with future possibilities, especially those arising from the beginning of the digital age.

## Assessing Self-Esteem

With more than 200 different scales that ostensibly assess self-esteem [29], the critical issue of assessing self-esteem is far from simple. One of the reasons of this enormous effort lies in a critical element of self-esteem, namely the fact that self-esteem is, by definition, a subjective construct which is not tied to objective standards [30]. Indeed, because its subjective nature, self-esteem has been assessed mostly by self-report scales [31], and to a smaller extent by implicit measures [32]. It is based on subjective, affective-laden evaluations of one's own self, which however can occur with respect to specific domains (such as work, athletics or physical appearance) or to more broad and general level (such as overarching evaluation of the self as a whole).

A time specific self-evaluations represent the state self-esteem, which refers to the "feeling" aspect of self-esteem, that is an individual's affectively loaded self-evaluation in a given, specific situation [26]. Whereas, evaluation of the self as a whole refers to global, general or trait self-esteem [31]: it is one's long-term,

characteristic and somewhat stable affectively charged self-evaluation. Because of trait self-esteem is a person's "summary" self-evaluation, it may or may not reflect her state self-esteem in a particular situation.

Finally, self-esteem may capture self-evaluations in specific domains: fluctuations of state self-esteem around a person's self-esteem typical level can be understood in terms of contingencies of self-worth [33]. Central to this model is the controversy that the way events and circumstances impact self-esteem lies on the perceived relevance of those events and circumstances to one's contingencies of self-worth: in other words, contingency self-worth represents a self-evaluation particularly vulnerable in which a failure or rejection is devastating to our sense of self-esteem [13, 34].

Historically, scholars involved in self-esteem research have focused mainly on individual differences in dispositional self-esteem [26]. However, from a practitioner's perspective, it is worth studying both stable self-esteem *and* its fluctuations, not only for the obvious advantage of better defining the construct itself, but also due to its possible applications. From the clinical perspective, measuring fluctuation of self-esteem allows to assess the efficacy of clinical interventions quantifying changes in self-esteem. Additionally, it can be used as a valid manipulation check in experimental design in which self-esteem is enhanced or diminished in a specific point in time. Finally, it can be used to understand confounded relations with other constructs. In the subsections below we discuss the assessment of both trait and state self-esteem (2.1), as well as situational self-esteem (2.2). In Table 11.1 we report the main characteristics of the reviewed scales measuring self-esteem.

### ***Trait, Global, and State Self-Esteem Measures***

As James [37] argues self-esteem is open to momentary changes, thus it raises and falls as a function of one's aspirations and success experiences. Within this framework—developed from the wide body of research that supports self-esteem as an enduring yet flexible concept [18, 38–40]—*state self-esteem* refers to how we evaluate or feel about ourselves in a given situation or at a given point in time. State self-esteem is therefore considered as a series of transitory states, momentary fluctuations, short-lived changes in one's own global self-esteem [36]. However, although momentary self-evaluations may be context dependent, there is a self-feelings people have the tendency to maintain and a level of self-esteem that derives by averaging feelings about themselves at one time across a number of different social situations: *trait* or *global self-esteem*.

#### **Trait and Global Self-Esteem Measures**

To assess trait self-esteem, scholars have developed several measures which differ in number of items and latent dimensionality. Here we discuss the *Single-Item Self-Esteem Scale* (SISE; [35]), the *Rosenberg Self-Esteem Scale* (RSE; [18]), and the

*Self-Liking/Self-Competence Scale-Revised* (SLSC-R; [20, 21]) which are among the most common tools used to assess trait self-esteem.

*Single-Item Self-Esteem Scale (SISE)*. The simplest way to assess trait self-esteem is to ask individuals whether they have high self-esteem. In fact, this is the core of the Single Single-Item Self-Esteem Scale, which aims to assess the global self-worth or the overall attitude that one holds about oneself (SISE; [35]). The SISE was developed from the Rosenberg Self-Esteem Scale (described in the next section of this chapter) to assess self-esteem in contexts where time or other constraints severely limit the possibility of using or administering more complex or comprehensive measures of self-esteem. The SISE, as suggested by its name, consists of a single item and assesses a person’s explicit knowledge about her global self-evaluation. This very brief, standardized measure of global self-esteem is valid

**Table 11.1** Measures of self-esteem reviewed in this chapter

Name of the measure	References	Number of items and Response scale	Definition and Components of self-esteem	Type of self-esteem
Single-Item Self-Esteem Scale (SISE)	[35]	1 item 5-point Likert scale	Global self-worth: Overall attitude that one holds about oneself	Trait/ Global
Rosenberg Self-Esteem Scale (RSE)	[18]	10 items 4-point Guttman scale or 5-point Likert scale	Global self-worth: Overall attitude that one holds about oneself	Trait/ Global
Self-Liking/Self-Competence Scale-Revised (SLSC-R)	[21]	16 items 5-point Likert scale	Self-esteem involves a personal sense of worth (self-liking) and a personal sense of efficacy (self-competence): (a) Self-liking: feeling positive towards one’s own self; (b) Self-competence: feeling capable and in control, and to believe that one will be successful in the future	Trait/ Global
State Self-Esteem Scale (SSES)	[36]	20 items 5-point Likert scale	Self-esteem is the overall evaluation of the self and comprises: (a) Performance self-esteem: the extent to which a person feels her performance is worthy; (b) Social self-esteem: the extent to which a person feels self-conscious, foolish, or embarrassed about her public image; (c) Appearance self-esteem: the extent to which a person feels about her physical appearance.	State

(continued)

**Table 11.1** (continued)

Name of the measure	References	Number of items and Response scale	Definition and Components of self-esteem	Type of self-esteem
Multidimensional Self-Esteem Inventory (MSEI)	[22]	116 items 5-point Likert scale	Global self-esteem (satisfaction with the self and confidence); identity integration (the self's internal integrity); and Defensive self-esteem (defensive reaction of changes in one's own self-esteem). Components of self-esteem: (a) Lovability (ability to express and receive affection) (b) Likeability (feeling accepted and liked by others) (c) Moral self-approval (satisfaction with one's moral values and acting accordingly) (d) Body appearance/physical attractiveness (being satisfied with one's body image) (e) Competence (ability to master new tasks) (f) Personal power (being assertive and able to influence others) (g) Self-control (being disciplined, persistent, able to set, and reach one's goals) (h) Body functioning/vitality (motor coordination and the feeling of being fit)	Trait/ Global and Specific
Contingency of Self-Worth scale (CSWs)	[33]	35 items 7-point Likert scale	Seven domains of contingent self-worth: 1. Academic competence 2. Physical appearance 3. Virtue 4. Having God's love 5. Having love and support from family 6. Outdoing others in competition 7. Obtaining others' approval	Contingent

and reliable [31] and asks participants to rate whether to have high self-esteem (“*I have high self-esteem*”) is true for them (on a 5-point Likert scale, ranging from ‘not very true of me’ to ‘very true of me.’). Although very simple to use, single-items measures are often less reliable than other multi-items measures, especially when constructs are heterogeneous [41]. Specifically within the realm of self-esteem and compared to multi-item measures, single-item measures are more susceptible to a

person's biased knowledge of her own explicit feelings of specific or global self-worth, and are also more vulnerable to acquiescence and social desirability [31, 35]. Yet, SISE demonstrated to have a high convergent validity with other measures of self-esteem [31, 36] and therefore can be used without reservations in situations and research contexts that would require a single-item measure of self-esteem.

*Rosenberg Self-Esteem Scale (RSE).* Perhaps the most commonly used scale to assess trait self-esteem is the Rosenberg Self-Esteem Scale (RSE; [18]). The global self-esteem measured by the RSE is defined as the overall attitude one holds about oneself. This mono-dimensional definition of self-esteem implies the assumption that one might believe to be 'good enough' (high self-esteem) or not—meaning, to occur in self-rejection and to lack self-respect. This 10-item, easy-to-administer, self-esteem scale (example question: “*I feel that I have a number of good qualities*”), is originally designed as a 4-point Guttman scale but is often measured on a 5-point Likert-type scale, ranging from (1) Strongly disagree to (5) Strongly agree. It quickly became the “gold standard” for self-esteem research [20]. Although RSE is the most widely used assessment of self-esteem in research with a high reliability and validity [31], there has been discussions about its mono-factorial or multi-factorial structure [42]. However, it seems that a prominent global self-esteem factor consistently explains a considerable amount of variance in the RSE items [43–45], supporting the hypothesis of the mono-dimensionality of the RSE items [46].

*Self-Liking/Self-Competence Scale-Revised (SLSC-R).* To solve the single- vs. multiple-factor composition of the measures of self-esteem, a specific scale measuring two distinct components of global self-esteem was developed. Specifically, the Self-Liking/Self-Competence Scale (SLSC; and its Revised version SLSC-R) measures the two dimensions of self-esteem corresponding to a personal sense of worth (i.e., self-liking) and to a sense of personal efficacy (i.e., self-competence; [20, 21]). More specifically, the authors define self-liking as feeling positive towards one's own self, while self-competence refers to feeling capable and in control, and to believe that one will be successful in the future. The SLSC is a 16-item self-report scale, measured on a 5-point Likert-type response scale, which encompasses two 8-item subscales measuring each of the two components of self-esteem. The two dimensions (self-liking and self-competence) are related, but substantially distinct [31]. This scale has shown high reliability and convergent, discriminant and construct validity.

## State Self-Esteem Measures

As mentioned, a momentary self-evaluation is represented by the state self-esteem, also called self-esteem feeling, which indicates a person's affectively laden self-assessment in a given situation [26]. The development of a measure of state self-esteem stemmed by the need for an instrument designed exclusively for assessing the momentary self-evaluations and self-esteem fluctuation [36, 47]. Here we

discuss the *State Self-Esteem Scale* (SSES, [36]) and the *Multidimensional Self-Esteem Inventory* (MSEI; [22]).

*State Self-Esteem Scale (SSES)*. The State Self-Esteem Scale (SSES) is a 20-item Likert-type scale designed for measuring temporary changes in individual self-esteem and is composed by three subscales including performance, social, and appearance self-esteem [36]: the performance component measures the extent to which subjects feel their performance is worthy (example question: “*I feel confident about my abilities*”); the social factor assesses the extent to which people feel self-conscious, foolish, or embarrassed about their public image (example question: “*I feel self-conscious*” [reversed item]); finally, the appearance element is instead related to physical appearance (example question: “*I feel good about myself*”).

*The Multidimensional Self-Esteem Inventory (MSEI; [22])* is an extensive self-report inventory which aims to define a respondent’s profile across eight categories: four categories related to worthiness (lovability, likability, moral self-approval, and body appearance) and four related to competence (competence, personal power, self-control, and body functioning)—which are understood to impact self-esteem. Additionally, the MSEI includes three dimensions related to global measures of self-esteem, sense of identity, and defensiveness—which are understood as overall characteristics of or related to self-esteem. This inventory, initially developed as a clinical test for measuring and treating self-esteem and self-esteem related issues [24], has been widely used and validated across a great variety of domains both in research and clinical work (e.g., abuse, substance abuse and harassment; positive psychology, adjustment and emotional intelligence; academic, work and sport performance; goal attainment; childhood and adolescence wellbeing; emotional awareness, expression, reactivity and regulation; health psychology and physical wellbeing; mood, eating and personality disorders; stress and coping, trauma, anxiety; treatment, prevention, psychotherapy, self-help; for a complete list see [48]).

The MSEI consists of 116-item rated on a 5-point Likert scale: (‘strongly agree’ to ‘strongly disagree’; or, ‘hardly ever’ to ‘very often’) which profiles the respondent’s self-esteem on the following 11 scales: lovability (ability to express and receive affection), likeability (feeling accepted and liked by others) moral self-approval (satisfaction with one’s moral values and acting accordingly), body appearance/physical attractiveness (being satisfied with one’s body image), competence (ability to master new tasks), personal power (being assertive and able to influence others), self-control (being disciplined, persistent, able to set, and reach one’s goals), body functioning/vitality (motor coordination and the feeling of being fit), global self-esteem (satisfaction with the self and confidence), identity integration (the self’s internal integrity), and defensive self-esteem (defensive reaction of increasing one’s self-esteem). This instrument was developed by gathering and categorizing thousands of incidents that participants reported as impacting on their self-esteem [24]. Accordingly, the emerged eight areas of life impacting self-esteem can be considered the components of self-esteem. In addition, the global measures of self-esteem and of secure sense of identity provide information about the overall feelings of worthiness and sense of security in one’s identity; and the assessment of defensive self-enhancement differentiates between secure vs insecure self-esteem:



high scores express a biased self-presentation which denies weaknesses and claims strengths and which may not correspond to genuine self-evaluations [24].

The MSEI can be compared to other measures of self-esteem (especially with the SLSC-R) because the eight components can be construed as corresponding to the realms of worthiness or competence. Specifically, the categories of lovability, likability, moral self-approval, and body appearance imply that the source of self-esteem is more dependent on acceptance and worth, and in fact they are based in part on a judgment of acceptance and value (worthiness). Instead, the categories of competence, personal power, self-control, and body functioning imply that the source of self-esteem is more dependent on one's own ability to proactively impact the world, and are in fact based in part of one's own agency and efficacy (competence)—namely, the pillars of perceived self-efficacy [49]. However, despite the validity, applicability and the comprehensiveness of the MSEI [10, 24, 48, 50], it is not always possible to use such instrument out of clinical settings where time constrains or other impediments might hinder the likelihood of its usage [22].

Nevertheless, it is worth noting that MSEI is able to provide important insights that other instruments cannot grasp. First, global measures of self-esteem may not provide sufficient information specificity on which facet or dimension of self-esteem is particularly problematic (or functional) for a given person. Measures that are too specific or contingent are also problematic since a particular domain (e.g., athletic performance) may be relevant for someone but not for others [26]. Therefore, the mid-level components of self-esteem identified by the MSEI represent a level of analysis useful for effective applied interventions: on the one hand, these components are general enough to be related to a general trait measure of self-esteem (to which they have strong correlations; [24]) and thus changes in these component can have an impact on overall self-esteem; on the other hand, they are specific enough to provide a deeper, idiosyncratic understanding about how to build on one's own strengths and overcome weaknesses in the likelihood of an intervention for increasing self-esteem [24].

Second, the dimension of defensiveness assessed by the MSEI is a critical element in assessing self-esteem: it represents a person's social desirability bias, namely a bias in self-appraisal, in which she claims rare virtues and denies common human weaknesses (e.g., gladly accepting criticism vs. never trying to avoid unpleasant responsibilities). Evaluating defensiveness scores on the MSEI allows insight into self-presentation and projection to others of an overly positive image of themselves, or in other words of a false self-esteem.

### *Contingency of Self-Esteem*

Expanding upon James' [37] idea that individuals differ in the domains on which they base their self-esteem, scholars have proposed several measures that capture domain-specific self-worth. The domains represent the context in which we are not only most likely to pursue self-esteem, but also are most vulnerable—in which a

failure or rejection is devastating to our sense of self-worth [34]. Based on the work carried out by Crocker, Luhtanen, Cooper, and Bouvrette [51], which we discuss next, researchers have developed measures of contingent self-worth in several domains, such as friendships [52], romantic relationships [53, 54], and body weight [55].

*Contingency of Self-Worth scale (CSWs)*. According to Crocker and Wolfe [33], individuals differ in the areas on which they base their self-worth and they proposed a model that examined self-worth in specific domains. CSWs is a 35-item measure divided into seven domains of contingent self-worth: academic competence, physical appearance, virtue, having God's love, having love and support from family, outdoing others in competition, and obtaining others' approval [51]. A key prediction of the CSWs model is that the impact of life events on self-esteem and affect is proportionate to the relevance of such events to one's contingency of self-worth. In other words, our self-esteem is more affected (positively or negatively) by events that occur in areas of life that are relevant for us—and for our identity. For example, students who strongly based their self-worth on academic competence experienced lower state self-esteem when they performed poorly on academic tasks, received lower-than-expected grades, or were rejected from graduate schools, compared to those whose self-worth was less based on this domain or did not experience self-threat [56, 57].

## The Motivational Force of Self-Esteem

It is clear, at this point, that self-esteem is a complex psychological variable and thus there is not a unique way to assess it. In order to effectively operationalize self-esteem, it is important to have clear what aspect of self-esteem is important to a given research question and be aware of the objective limits of the measures available in the literature.

Perhaps, one of the most worrisome issues related to the abovementioned measures is their self-report nature, which is also a wider issue in psychological research. Self-report measures entangle several advantages but limitations too, such as memory limitations, recall biases, and social desirability sensitiveness, as in the case of the SISE which was found susceptible to acquiescence and social desirability [31, 35]. To overcome these measurement problems, some researchers have assessed implicit self-esteem (Implicit Association Test-IAT; [58]) by assessing automatic associations of self (through reaction times) with positive or negative valence [59]. However, the studies revealed unclear results, as construct divergence between implicit and explicit measures of self-esteem emerged. This result might seem contradictory, yet it highlights that the self-report measures of self-esteem developed to this point, although reliable, valid and all somehow different from each other, have all a common limitation. The operationalization of self-esteem so far developed takes into consideration its cognitive (evaluation of oneself, e.g., RSE), affective (emotional responses, e.g., SSES), behavioral (competence, e.g., SLSC-R), and

value components (domain important to the individual, e.g. CSWs), yet they neglect an important aspect of self-esteem: namely, its motivational component. Understanding self-esteem as a fundamental psychological need implies that people are motivated to gain and maintain high levels of self-esteem: in other words, self-esteem is a goal in and of itself [60]. According to this conceptualization, self-esteem is a self-motive: it provides both a standard and a direction for behavior.

However, although the idea that this motive underlies human behavior has been a central theme in psychological theorizing (e.g., [33, 37, 61–65]), self-esteem has been traditionally assessed as a status (situational or stable) that characterizes the individual and does not capture the *desire* for a high self-esteem. In defining self-esteem, Crocker and Wolfe [33] recognize the motivational component of such psychological construct; yet, their operationalization of self-esteem does not capture whether the individual is striving to increase the level of self-esteem. Indeed, this operationalization of self-esteem as a motivational concept is, perhaps, the missing link to understand the behavioral strategies with which the individual might decide to engage to pursue or regain optimal levels of self-esteem.

As mentioned, many scholars have indeed assumed that people possess a motive or need to maintain self-esteem (e.g., [27]). The abovementioned sociometer theory grasps very well this idea, by conceptualizing the motivational force of self-esteem (namely, the self-esteem motive) as the human impulse of minimizing the likelihood of relational devaluation, or in other words, of rejection [25, 26]. This, in turn, leads to the pursue and preservation of high self-esteem. In fact, people typically act in ways that they believe will be of help in increasing their social acceptance by increasing their relational value: when this process is achieved, the individual's self-esteem will be enhanced. On the contrary, when a given situation, a behavior, or even an anticipated, potential, or irrational consequence of a behavior, might hinder the social or relational value of a person, her self-esteem is reduced or, at least, perceived to be threatened. Indeed, events that are known (or potentially known) to be “public”, and therefore are more socially laden, have great effects on self-esteem; rather, “private” events, that are lived (or perceived to be lived) only by the individual, are usually less influential on self-esteem: if self-esteem was determined exclusively by private self-judgments, socially laden events should have no greater impact on self-esteem than private ones [27].

### **The Dark Side of Self-Esteem**

Perhaps, one of the most significant and influential consequence of this conceptualization lies in the understanding of the crucial role of self-esteem in undesirable behaviors. Indeed, although self-esteem has been historically associated with desirable outcomes (e.g., better performance; [6]), it also recognized that high self-esteem can be associated with certain dysfunctional psychological processes and undesirable behaviors, such as egotism, narcissism, and violence: the dark side of self-esteem [66].

Within this conceptualization, the defensive aspect of self-enhancement grasped by the MSEI gains significant relevance. As mentioned, this inventory differentiates between secure vs insecure self-esteem, with high scores expressing a biased

self-presentation which tends to always deny weaknesses and claim strengths. This biased self-presentation may correspond to a non-genuine self-evaluation [24]. Therefore, this non-authentic self-assessment (being conscious or not) might cover other negative patterns of self-evaluations, such as those related to negative, unstable, contingent or narcissistic self-appraisals. In this conceptualization, the definition of self-esteem as a motive potentially could explain the heterogeneity of individuals with high self-esteem, encompassing people who honestly acknowledge their good (and bad) qualities along with narcissistic, defensive, and arrogant individuals [6]. Simply put, the definition of self-esteem as a motive would presuppose that people would strive for high self-esteem, no matter if it is non-genuine or authentic.

Indeed, high scores in overall self-esteem coupled with high variability in the worthiness dimensions of the MSEI are often associated with high scores of narcissism and aggression [67]. What follows, is that *high* and *optimal* self-esteem actually are two distinct constructs: the former can be fragile or secure, while the latter is characterized by genuine, true, stable, and congruent (with implicit self-esteem) high self-esteem [67, 68]. Likewise, contingent self-esteem studies (e.g., [13, 69]) have also argued for the existence of the dark side of positive self-appraisal, in which individuals become psychologically vulnerable due to their dependence on external validation for their self-esteem.

General principles from this work may be useful for clinical and non-clinical consideration alike. Yet, no specific implications have been developed or tested for assessing or intervening to address contingent self-esteem in a way that could consider positive authentic and dark self-esteem simultaneously, as well as its motivational component.

## Future Directions in Assessing Self-Esteem

As we described beforehand, researchers have developed several kinds of measures targeting different features of self-esteem. To sum up, the literature provides measures to assess the state self-esteem, trait self-esteem, and domain-specific self-esteem. However, the quantitative psychological studies carried out to develop such measures relied heavily on surveys and laboratory experiments, which have well-known and long-endured limitations. In fact, on the one hand, surveys require people to make retrospective and often generalized judgments, which tend to be affected by memory limitations and recall biases [70, 71]. On the other hand, laboratory experiments do not take into account the context of a person's daily life which can influence her states and responses [72, 73]. Taken together, these considerations raise questions about the ecological validity of theoretical and methodological conclusions if not coupled with field data [74].

Furthermore, it seems that among several possible theorizations and measures of self-esteem, there is still a lack of consensus upon the most adequate ones. Obviously, it would be too simplistic and trivial to presuppose *a priori* which theoretical model

and measure should be considered the finest to grasp the most precise definition and operationalization of self-esteem. We suggest that the best possible way to overcome such limitations—at least in part—and therefore to select the most efficient and accurate measure of self-esteem, is threefold: (a) to consider carefully the aspects of the psychological process under scrutiny; (b) to understand which facets of self-esteem would be relevant to the main research question; and (c) to take into account which scientific method (e.g., correlational, experimental, etc.) will be most suitable and effective in a given setting.

Nevertheless, as Baumeister et al. [75] argued, more attention should be given to how individuals actually behave in various situations rather than rely on what they claim, recall having done, or believe they would do in hypothetical situations. In addition, more attention should be given to the interaction between individual and social idiosyncrasies of self-esteem [26], as a growing amount of evidence shows that different constructs related to the *self* should indeed incorporate individual, social and cultural components (e.g., [76]).

Within this perspective, the widespread use of mobile technologies opens up new opportunities of collecting (social-) psychological data in specific contexts and situations. For example, mobile technology is already widely used to optimize health behavior change interventions (e.g., [77]). More specifically, the use of new digital technologies can help to overcome the limitations of the existing measures of self-esteem, giving the opportunity of looking at changes in self-esteem that occur in a field setting and therefore within the daily life moments. Such new data could not only be relevant to the understanding of self-esteem per se, but could be coupled with other types of data collected through various types of sensors (e.g., global positioning systems-GPS, microphones, cameras, activity and sleep monitors, heart rate monitors, etc.) or software (e.g., social networks activity, mobile apps, etc.). Therefore, thanks to the means provided by new digital and wearables technologies, for the first time self-reported measures of self-esteem can be combined (above and beyond other psychological measures) to physiological and behavioral measures.

Along this line of research, Quantified Self-enabled data collection procedures could be advantageous. The quantification of the self (Quantified Self—QS) is a form of self-tracking an one's own daily life activities and behaviors, which eventually allow for the analysis of behavioral trends and patterns across a variety of life domains (e.g., physical activity, nutrition, weight; [78]). Generally, QS helps the individual to reflect upon such patterns and trends, and potentially leads to the application of behavior change strategies built upon these data. Theoretically, the process of self-monitoring and self-tracking one's own data could be useful to kick-start a process of behavior change across different life domains by enabling the person to change her relation to her own body and health, and to better control health-related decisions [79]. However, although some evidence seems to corroborate these hypotheses (e.g., [80, 81]), caution should be used in implementing interventions based on QS. First, recent research shows that an excessive quantification of one's own actions and behaviors could lead to psychological distress [82, 83]. Second, and perhaps most importantly, an enormous amount of research shows that in order to promote long-lasting behavior change one will need to detach from the

monitoring of external objects and data, and rather should “monitor” his/her own internal physiological and psychological states and processes: in fact, by focusing on internal rather than external rewards and therefore by increasing intrinsic motivation in the new behavior (e.g., [84]), the person will in turn develop to greater self-awareness, presence in the moment, values and meanings, and perhaps identity change in the long term [85–87].

### ***New Technologies and Social-Psychological Processes and Constructs***

However, as mentioned before, the opportunities arising from the digital era should not be overlooked. In the last couple of decades, plenty of research has shown the link between various technological tools (both hardware and software) and a plethora of psychological processes and characteristics. Since the spread of mobile phones and smartphone, one track of research aimed to study the relationship between the (mis)use of technology and psychological processes (e.g., [88–90]). For instance, Andreassen et al. [88] examined the effect of personality traits such as narcissism, socio-demographic characteristics, and self-esteem on addictive social media. Among the others, and accordingly to previous research [91–93], they found that positive self-concept (i.e., high self-esteem) was negatively related to social media addiction, indicating that the Internet may provide a different social arena from the in the face-to-face life to enhance self-esteem. This track of research is extremely useful and much needed, since it helps clarifying (and will continue to do so) the psychological processes which can cause, be related, or be caused by the functional or dysfunctional use of different technology-based tools. For example, personality traits can predict Facebook use [94], while technology-based self-help therapies—which relies on minimal contact with an actual therapist—have proven effective, low-cost interventions at least for anxiety and mood disorders [95].

Furthermore, together with the development of social media, wearable devices, machine learning, big data, data mining technologies, internet of things, etc., another track of research has been consistently growing and aims to leverage these new technologies and related digital tools in various healthcare-related domains [96, 97]. More specifically within the social-psychological domain, this track of research is extremely interesting since it could unveil a totally new research field which will transform the way we measure social-psychological constructs and processes: it is indeed possible to leverage new technologies to measure such constructs and processes—which have been historically assessed by self-reported measures exclusively—through behavioral data collected in a unobtrusively and longitudinally manner (via wearables, smartphone use, smart home and smart office, smart meters, etc.; e.g., [98]). Some research has already succeeded in this goal. For example, aggregated smartphone usage features can predict the Big-Five personality traits

[99]; Facebook likes can predict, among other sensitive personal attributes, personality traits, intelligence, happiness and addictions [100]; and, the combination of mobile phone usage and sensor data can predict with 75% accuracy low and high perceived stress [101]. It is therefore clear that the relationship between automatically extracted physiological and behavioral characteristics derived from rich data, and self-reported measures of social-psychological constructs and processes, could be disentangled eventually, and could potentially lead to new, behavior-based, ecologically valid measures of such facets. For example, Sun et al. [102], correlated gait patterns with self-reported self-esteem measured via the RSS: first, all participants completed the RSS; then they walked for 2 min on a rectangular carpet, while their gait data were recorded using a Kinect sensor. Based on machine learning, the authors were able to build predicting models to recognize self-esteem, with significant results ( $r = 0.45$  for males;  $r = 0.59$  for females; both  $p < 0.001$ .)

### ***Toward New Methods of Quantifying and Conceptualizing Self-Esteem***

Based on the abovementioned considerations, and specifically in relation to self-esteem, we propose a new approach to measuring such construct which could shed light, on the one side, on its theoretical understanding and definition and, on the other side, on its applied implications and applications to promote greater psychological wellbeing and to enhance quality of life. Drawing upon recent developments in applied social psychology (e.g., [98]) the suggested approach would combine both self-reported and digital technology-based tools. Specifically in the context of Quality of Life Technologies (QoLT)—technologies for assessment or improvement of a person's quality of life [103]—we believe that the contingent measurement of self-esteem via self-report and digital technology-based tools, could potentially shed light on its facets and processes above and beyond what has been understood so far through the standalone implementation of self-report measures. In turn, this could potentially expand the goals of QoLT above and beyond its already defined aims [103]: QoLT could aim at clarifying and expanding the theoretical understating of latent variables included in the WHO definition of QoL, such as self-esteem.

In our view, the combination of self-reported and digital technology-based tools would allow researchers and practitioners to take into account the two missing factors that seem important to assess self-esteem, namely, the *momentary experience* and the *social context*. With reference to the former, we suggest that future research should investigate via digital tools the *momentary experience of self-esteem*, namely its daily fluctuations. Indeed, past research has shown that self-esteem: (a) is most closely connected to a specific class of emotions—rather than to the whole spectrum of emotions—that relate to how people feel about themselves in a specific moment [12]; (b) that self-esteem indeed is open to momentary changes, raising

and falling as a function of one's aspirations and failure/success experiences [36]; and that (c) one of the simplest way to measure state self-esteem is directly to ask individuals how they feel about themselves at that given moment via a single-item, valid and reliable measure [26]. In this vein, new technologies may be used to monitor *the momentary experience of self-esteem*, through collecting visual data (e.g., posture, clothes worn, facial expression and or posture in 'selfies' etc.), audio data (e.g., voice volume/pitch, etc.), text data for content analysis (e.g., text, social media posts, etc.), emoticon usage for sentimental analysis (e.g., number/type/of emoticon).

With reference to the latter, the social context, we believe that longitudinal information derived from new technologies usage (such as behavior shown on social media—likes, comments, selfies posted, etc.; data gathered from GPS enabled devices; physiological data such as heart rate variability, etc.), if combined with validated measures of self-esteem, can be indeed used to indirectly measure both the affective (e.g., self-liking) and behavioral (e.g., competence) components of self-esteem and to couple such components to the *specific social context* in which self-esteem components are assessed. In fact, previous research shows that: (a) self-esteem can be considered a monitor of social acceptance and therefore it motivates people to behave in ways that would make them valuable in specific social context which is perceived to be relevant by the individual [26, 27]; (b) the self-esteem motive, functioning as a tool to avoid social devaluation and rejection, should be measured in-context by contingent measures of such construct [51]; and (c) in-context measures of self-esteem can shed light on how self-esteem is implicated in affect, cognition, self-regulation of behavior and social processes, and can possibly unveil solutions to debates about the nature and functioning of self-esteem [34, 69]—and, in turn, suggest how self-esteem is causally related to mental health, wellbeing, performance and quality of life [6].

According to the abovementioned evidence, we believe that it would be possible to leverage new technologies specifically in two (or, arguably, one) methods of research: the Experience-Sampling Method [104] also known as the Ecological Momentary Assessment [74, 105]. Certain technology-based applications of such methods are already in use and show important mechanisms and processes that are relevant to the assessment and treatment of mental health—e.g., PsyMate™ [106, 107]—, such as the use of machine learning in predicting therapeutic outcomes in depression [108]. Along the same line of research, initial evidence reveals the efficacy of passive sensors for predicting self-esteem: by using machine learning techniques, it has been possible to relate performance, social and appearance self-esteem to several mobile-based digital behavior categories (such as calls, texts, conversations, and physical activity; [109]); furthermore, preliminary data indicate that is could be possible to correlate gait data to self-esteem with a fairly good criterion validity [102], suggesting that posture and perhaps other body-language characteristics could be taken as a good supplementary method to measure self-esteem.



## Conclusion

In conclusion, the present chapter shows that far more research is needed to really uncover the potential of a variety of digital and technological tools in the broader field of applied psychology—such as mobile and wearable technologies used in different contexts of applications for the promotion of better quality of life [110–112]. Within this realm, new measures and conceptualizations of self-esteem should likely depend on both intrapersonal and interpersonal/social factors. We suggest that academics and practitioners alike should try to take advantage of the opportunities provided by the digital age in trying to further understand and measure the concept of self-esteem, by specifically capturing the level of self-esteem in context and anchoring such level to specific behaviors. Such new methods might make both the intrapersonal and social influence of self-esteem salient and decipherable.

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