Hidden Self-Compassion

Psychometric Properties of a Novel Tool to Measure Implicit Self-Compassion

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Abstract

Background: Past research predominantly viewed self-compassion as a meta-cognitive construct. Based on dual-process theories, it is hypothesised that self-compassion can display itself explicitly and implicitly at the same time. Accordingly, the current study aims to develop a reliable Single-Category Implicit Association Test (SC-IAT) and test its psychometric properties.

Method: The first study utilised a test construction approach, while the second evaluated psychometric properties by using a two-wave survey. Stimuli, based on the Self-Compassion Scale (SCS), were validated by experts and laypersons through a pen-and-paper sorting test. In the second phase, participants (N = 62) rated their agreement on explicit measures of self-compassion, emotional intelligence, social connectedness, mindfulness, perfectionism, rumination, and state positive affect, before completing the SC-IAT on either a PC or phone. Four days later, they repeated the SC-IAT.

Results: The SC-IAT showed moderate test-retest reliability (r phone and PC = .51; r PC = .39; r phone = .59) and moderate internal consistency (r phone and PC = .6; r PC = .43; r phone = .81). D-scores obtained during initial assessment did not significantly correlate with self-compassion (r = .16, p = .16) or its subscales. Aggregated d-scores did not significantly correlate with mindfulness (r adjusted = .01, p = .92), emotional intelligence (r adj = .06, p = .63), social connectedness (r adj = .03, p = .82), or maladaptive perfectionism (r adj = - .16, p = .2). SC-IAT correlated weakly and negatively in magnitude with rumination (r adj = - .32, p < .01).

Conclusion: The SC-IAT, as a novel tool for measuring self-compassion implicitly, shows promising reliability. Device type, namely phone versus computer, significantly influences reliability, favouring phone-based assessments. This initial exploration into self-compassion's unconscious dimensions marks a valuable advancement, opening possibilities for future research. Nonetheless, the SC-IAT struggles with convergence and concurrence with explicit measures.

'Be kind and understanding towards yourself' encapsulates the significant psychological construct of self-compassion. Kristin Neff (2011) conceptualises self-compassion as an internalised form of compassion, where individuals show understanding and kindness to themselves in times of challenges and hardship. Despite the growing interest of self-compassion as a psychological construct contributing to improved mental health outcomes (Greenberg et al., 2018; Neff, 2023), current methodologies rely on explicit self-report measures (Neff, 2023). This limitation may not fully capture the complex and possibly subconscious nature for compassionate attitudes towards the self. This gap raises the question about the implicit assessment of self-compassion (Phillips et al., 2017), especially regarding its potential use in mental health interventions and outcomes (Ferrari et al., 2019; Wilson et al., 2019). Thus, there is a need to develop and validate an implicit measure of self-compassion, to address these limitations and provide a more holistic understanding of self-compassion and its possible implications.

Self-Compassion and Mental Health Factors

Self-compassion comprises three dimensions, namely self-kindness as opposed to self-judgment, common humanity as to contrasting isolation, and mindfulness versus over-identification (Neff, 2003). These components interact, supporting personal growth and emotional healing through understanding. For instance, self-kindness provides emotional support, common humanity alleviates feelings of isolation, and mindfulness offers a balanced approach to emotional experiences (Neff, 2003, Siegel et al., 2009; Zessin et al., 2015). Empirical studies consistently report the strong association between positive mental health outcomes and self-compassion (Neff, 2023; Neff et al., 2018).

In an experimental study, Leary et al. (2007) found that individuals, who were asked to recall unpleasurable past events and were given the prompt to write self-compassionately about these events experienced less negative affect afterwards compared to the control group. Additionally, meta analyses indicated a medium effect size of interventions aimed to increase self-compassion in reducing symptoms of PTSD and eating disorders, as well as lessened body dysmorphia (Luo et al., 2021; Turk & Waller, 2020). These reductions in psychopathology have been attributed to self-compassion's capacity to increase emotion regulation skills (Inwood & Ferrari, 2018), fewer avoidance of unpleasurable emotions (Yela et al., 2022), diminish automatic negative thinking patterns (Yip & Tong, 2021), while simultaneously enabling an embroilment of these negative emotions (Miyagawa & Tanigushi, 2020). These implications explain self-compassion's integration into therapeutic settings like Compassion Focused

Therapy (CFT) and Mindful Self-Compassion (MSC) (Germer & Neff, 2013; Germer & Neff, 2019; Gilbert, 2010).

The effectiveness of therapeutic approaches like CFT and MSC underscores the role of self-compassion in enhancing emotional well-being and regulation. These methods foster compassionate and mindful attitudes towards oneself, leading to notable improvements in well-being. Such advancements are not only psychological but are also reflected in neurological changes, highlighting a profound transformation in how the brain processes self-related information. Furthermore, a significant decline in self-critical thoughts and negative self-perceptions contributes to reduced emotional reactivity towards negative self-assessments. This shift is pivotal in fostering of unconditional self-acceptance. The incorporation of self-compassionate responses into daily life, without the need for conscious effort, points to the automatization of these attitudes. This automatization suggests that self-compassion operates on dual levels of consciousness, influencing both conscious and unconscious thought processes.

Theoretical Foundations for Hidden Self-Compassion

This duality aligns with the Reflective-Impulsive Model (RIM), which provides an understanding of how cognitive processes, reflective and impulsive, interact and shape human behaviour (Krishna & Strack, 2017), particularly underpinning the dual nature of self-compassion within an individual's cognition. Both systems operate concurrently, with the reflective system triggering concept activation within the impulsive system, leading to a spread activation of related cognitions from long-term memory. This interaction implies that a single cognitive process can be represented in both systems, with reflective system processes becoming more efficient over time, particularly when reflective and impulsive cognitions are aligned (Krishna & Strack, 2017). Within this framework, self-compassion is portrayed as a multifaceted construct. On one hand, it can be an existing cognitive association activated during adversities through the reflective system, enhancing compassionate responses in the impulsive system. On the other hand, self-compassion can be an actively trained response that gradually mitigates rigid negative self-beliefs.

Integrating insights from Greenwald and Banaji (1995) with RIM offers a nuanced view of how self-compassion may operate on both conscious and unconscious levels, akin to self-esteem. Greenwald and Banaji's (1995) observation that implicit social cognitions, including self-esteem, are shaped by experiences and function below the level of conscious awareness, subtly shaping behaviour, suggests that self-compassion, being similarly self-related could also manifest automatically, guiding personal responses with inherent kindness and understanding. This aligns with the RIM's understanding of self-compassion as encompassing both a

consciously developed trait through practices like Mindfulness-Based Cognitive Therapy (MBCT) and cognitive restructuring, and as an instinctive, automatic response (Krishna & Strack, 2017; Kang et al., 2013; Piet & Hougaard, 2011; Wenzel, 2017). The dynamic between the reflective and impulsive systems highlights self-compassions contribution to emotional resilience and psychological health. This underscores the importance for continued research into the implicit dimensions of self-compassion, especially for developing therapeutic approaches such as Cognitive Bias Modification. Delving into the unconscious elements of self-compassion promises to enrich the development of interventions that leverage both deliberate and automatic processes, potentially elevating the effectiveness of strategies designed to foster self-compassion.

The Single Category Implicit Association Test

Inspired by Greenwald and Farnham's (2000) application of the Implicit Association Test (IAT) to assess implicit self-esteem, the current study investigates whether self-compassion possesses an implicit component like other self-related concepts. Recognising the limitations of traditional self-report instruments such as the Self Compassion Scale in capturing implicit aspects, this research aims to bridge this gap. The IAT, recognised for its ease of administration (Karpinski & Steinman, 2006), is employed, typically involving contrasting concepts (e.g., 'self' vs. 'others') assessed through their associations with different attributes (e.g., 'positive' vs. 'negative'). It operates on the principle that quicker responses in associating concepts with attributes suggest stronger implicit connections. The relative strength of these associations is derived from participants' reaction times and are typically called d-scores (Greenwald & Farnham, 2000).

In the current study, the target categories for the IAT are identified as 'compassion' and 'criticism,' with further elaboration on this choice to be provided subsequently. The selection of appropriate concepts for the IAT, particularly in the context of self-compassion, raises a crucial issue regarding the complementary category. 'Self' is unequivocally chosen, yet the use of 'other' as a counterpart introduces complexities. This is because self-compassion is often intertwined with compassion towards others, potentially blurring the lines between these categories. Printer and Greenwald (2005) have highlighted the importance of a cautious interpretation of the 'other' category in IAT results to avoid ambiguity. Therefore, to maintain a clear focus on self-compassion, this study opts to exclude the 'other' category from the IAT framework.

To address this issue, the Single-Target IAT (SC-IAT) will be employed. The SC-IAT narrows the focus to a single target, 'self,' thereby offering a more direct evaluation of the association between 'self' and attributes like 'compassion' or 'criticism.' This approach aims to

provide a clearer assessment of self-compassion by measuring how quickly and accurately participants link these attributes specifically to themselves, without the comparative element introduced by the 'other' category.

Reliability and Validity Assessment

The SC-IAT represents an innovative approach to measure self-compassion, addressing the need for a tool that captures the multifaceted nature of this psychological construct on an implicit level. Recognising the importance of self-compassion in promoting psychological well-being, the SC-IAT aims to accurately reflect self-compassion's theoretical components and differentiate it from related but distinct constructs. This distinction is crucial, given the established links between self-compassion and a range of positive psychological outcomes, including reduced symptoms of depression and anxiety, increased emotional intelligence, and stronger feelings of social connectedness (Barnard & Curry, 2011; Greenberg et al., 2018; Castilho et al., 2016; Di Fabio & Saklofske, 2021; Neff, 2003; Neff et al., 2007b). Furthermore, self-compassion's inverse relationship with detrimental mental health factors like rumination and its association with maladaptive perfectionism highlights its significance in mental health research (Neff, 2003; Neff et al., 2007a; Neff & Vonk, 2009; Raes, 2010; Svendsen et al., 2020; Svendsen et al., 2022). Thus, the development and validation of the SC-IAT respond to the critical need for a reliable and valid measure of implicit self-compassion. Consequently, the reliability and validity of the SC-IAT will be assessed through evaluations of construct validity, content validity, face validity, convergent validity, concurrent validity, test-retest reliability, and internal consistency, ensuring a comprehensive validation process.

Current Research

Current methodologies largely depend on explicit self-reporting for self-compassion assessment (Muris & Petrocchi, 2017), potentially overlooking its subtle, subconscious aspects (Alasiri et al., 2019; Phillips et al., 2017). This study introduces a novel method for implicit measurement of self-compassion, exploring its relationship with related constructs. With no existing tool for implicit self-compassion assessment, this paper comprises two studies: the first on developing the SC-IAT stimuli based on the Self-Compassion Scale, and the second on evaluating the SC-IAT's psychometric properties.

Study 1

Open research question 1: Are the developed stimuli relevant and accurately representative of self-compassion indicating the stimuli's content validity?

Open research question 2: How clear and understandable are the stimuli to the study population of international students indicating the stimuli's face validity?

Study 2

RQ1: *To what extent do the d-scores from the first SC-IAT administration correlate with those from a subsequent SC-IAT administration four days later in a test-retest reliability assessment per device type and combined?* It is hypothesised that the d-scores from T1 and T2 correlated weakly to moderately and positively with each other, when combining phone and pc assessments. Additionally, it is hypothesised that test-retest reliability is weaker in the group of phone assessments compared to pc assessments.

RQ2: *To what extent do the d-scores from the separate thirds obtained during T1 correlate witch each other per device type and combined, indicating the SC-IAT's internal consistency?* It is hypothesised that the corrected averaged correlations of the separate thirds obtained during T1 correlate moderately with each other when combining phone and pc assessments. Additionally, it is hypothesised that internal consistency is weaker in the group of phone assessments compared to pc assessments.

RQ3: *To what extent does the newly developed SC-IAT show concurrent validity by correlating significantly with trait self-compassion?* It is hypothesised that the d-scores obtained from the SC-IAT for implicit self-compassion will show a positive and weak correlation with the scores of trait self-compassion and it's subdimensions as measured by the Self-Compassion Scale.

RQ4: *To what extent does the newly developed SC-IAT show convergent validity by correlating significantly with established measures of self-compassion and theoretically related constructs?*

H4.1: The d-scores obtained from the SC-IAT for implicit self-compassion will show a positive and weak correlation with the scores of trait mindfulness, state positive affect, trait perceived social connectedness, and trait emotional intelligence.

H4.2: The d-scores obtained from the SC-IAT for implicit self-compassion will show a negative and weak correlation with the scores of trait rumination and neurotic perfectionism.

RQ5: *To what extent does device type used during T1 moderate the association of d-scores on self-compassion scores?* Generally, SC-IATs are computer-based instruments (Greenwald et al., 2020; Karpinski & Steinman, 2006), however, in the current study, participants are allowed to perform the SC-IAT on their phones. As the traditional way is computer-based, it is hypothesised that device type negatively moderates the association between d-scores on self-compassion and its subscales subsequently in favour of computer-based assessments.

RQ6: To what extent is state positive affect associated with the d-scores obtained from the SC-IAT at T1 and T2? As trait positive affect is positively correlated with trait SCS scores and inversely with trait negative affect (Neff et al., 2007b), it is hypothesised that momentary positive affect is significantly associated with the d-scores from the SC-IAT. A positive relationship is expected, whereby higher levels of momentary positive affect correspond to higher d-scores.

Methods Study 1

Design

The study employs a test construction design for the SC-IAT, focusing on developing and initially validating stimuli items. The validation of the stimuli involves engaging experts in self-compassion and related concepts and laypersons, to ensure the stimulus' relevance, clarity and alignment with the theoretical dimensions of self-compassion.

Participants

Four experts consulted on the SC-IAT's initial content validation, specialised in IAT and Cognitive Bias Modification, mindfulness, gratitude, and positive psychology. Seven laypersons, aged 21 to 30 ($M = 24.9$), including four females and three males, participated in an intuitive pen-and-paper sorting test. Additional details are provided in Table 1.

Procedure

The development of the SC-IAT drew upon the Self-Compassion Scale (SCS) as a foundational framework for assessing self-compassion at an implicit level. To generate potential stimuli for the SC-IAT, the 26 items from the SCS were categorised according to their respective subscales. Subsequently, each individual item was dissected into two distinct components: firstly, a description of a challenging situation (e.g., 'When I'm feeling down'), and secondly, a possible response to that situation (e.g., 'I tend to obsess and fixate on everything that's wrong').

Table 1

Sample Characteristics (N = 7)

		n	*%*
Gender	Female	4	57.1
	Male	3	42.9
Nationality	Dutch	1	14.3
	German	4	57.1
	Mexican	1	14.3
	Slovakian	1	14.3
Education	Bachelor	5	71.4
	Master	1	14.3
	Post-doc	1	14.3

From the situation component of the items, four overarching themes emerged: failure, unpleasurable emotional states, self-related discomfort, challenging times. These were summarised into a unified instruction to be presented to participants right before performing the SC-IAT (see Figure 1).

The response part of the items served as the foundation for constructing stimuli presented to participants during the actual SC-IAT. Derived from the pioneer in measuring implicit cognitions by using the IAT, stimuli should be simple in language to be understood and categorised easily as IAT's methodology relies on reaction times (Greenwald et al., 1998). Although, Greenwald et al. (2021) state, that "there is no need for selection criteria such as word length" (p. 1167), it was decided that stimuli will have a maximum length of three words, to ensure that they can be easily and quickly classified. After deciding upon these rules, an initial set of 26 stimuli was established.

Data Analyses

Content Validity: To assess the SC-IATs content validity and instructions, a team of four self-compassion experts was engaged, ensuring the instruments accuracy and relevance. As Magasi et al. (2012) and Anastasi and Urbina (1997) highlight, expert evaluation, despite its subjectivity, is essential for instrument validity. This subjective but invaluable process involved the experts' iterative assessment of whether the stimuli accurately represent self-compassion, examining the completeness and relevance across its dimensions: self-kindness, mindfulness, and common humanity. Their feedback was important to refining the SC-IAT, ensuring a comprehensive measure of self-compassion.

Face Validity: An intuitive pen-and-paper sorting test assessed the initial stimuli's clarity and exclusivity, categorising words into Compassion, Criticism, and Ambiguous.

Figure 1

Instructions Given to Participants Before Taking the SC-IAT

During the following tasks, please keep in mind the concept of self-compassion. Self-compassion involves being kind, understanding, and accepting of yourself, just as you would be towards a close friend or loved one who is going through a tough time.

Please imagine the following scenarios:

1. Picture yourself experiencing a situation where you failed in something important to you.
2. You feel sad, not good enough, upset or emotional pain.
3. Imagine facing parts of your personality that you don't like, such as your flaws or areas where you feel inadequate.
4. Visualize going through a difficult or painful period of time.

Ambiguous words or those misclassified were removed after discussion. Laypersons, chosen for demographic diversity and no specialised psychological background, ensured the test reflected the general publics view. This subjective yet essential step verified the SC-IAT's suitability for measuring self-compassion beyond academia (Anastasi & Urbina, 1997).

Results Study 1

Discussion with Experts

Key discussion points during the discussion included: (1) What is the negative anchor to 'self-compassion'?, (2) What should be part of the instructions to the SC-IAT?, (3) Which stimuli are simple and can be recognised easily to be mutually exclusively part of the positive or negative anchor?, and (4) How is the term 'self' for the attributes handled?

What is the Negative Anchor to 'Self-Compassion'?

In the development of the SC-IAT for self-compassion, identifying an appropriate antonym as the negative anchor was a crucial step. Although self-compassion is often viewed as a multi-dimensional construct (Neff, 2003), for the purpose of the SC-IAT, a single, contrasting target attribute needed to be selected (Greenwald et al., 2021). The natural antonym of self-compassion can be considered as self-criticism or self-judgment, given that these concepts represent the opposite attitudes towards oneself, representing the absence of kindness and understanding that characterises self-compassion.

However, using self-judgment as the negative anchor in the SC-IAT presented a challenge, as it is already an inherent dimension of self-compassion and could potentially serve better as a stimulus in the SC-IAT. This led to the consideration of alternative attributes. Supported by Greenwald et al. (2021), who suggest that attributes in IAT measures can carry a certain degree of valence, the decision was made to use 'criticism' as the negative anchor. Typically, compassion is perceived as something positive, while criticism often carries a negative connotation, which provides a clear contrast to self-compassion within the SC-IAT.

What should be part of the instructions to the SC-IAT?

In revising the instructions for the SC-IAT, a key objective was to prime participants into a mental state favourable to self-compassion, particularly in the context of challenging situations where compassionate responses naturally arise. This approach was inspired by the foundational principles and semantic structure of the SCS. The analysis of the explicit self-compassion items in the SCS revealed overarching themes that typically evoke self-compassionate responses. Based on these insights, participants were instructed to imagine themselves in specific scenarios reflective of these themes, thereby facilitating a mindset aligned with self-compassion. Alongside this imaginative exercise, a straightforward definition

of self-compassion was also provided for clarity. The detailed instructions are outlined in Figure 1.

Which stimuli are simple and can be recognised easily to be mutually exclusively part of the positive or negative anchor?

During the discussion, a consensus was reached to include six to seven stimuli for each anchor, with the condition of having at least two stimuli per subscale (kindness, mindfulness, common humanity). By achieving this goal, the SC-IAT aligns with established best practices in implicit association testing (Greenwald et al., 2021). Some stimuli were, based on their lexical complexity already discarded. For instance, one stimuli 'Perceived Disparity' representing 'I tend to feel like other people must be having an easier time of it' was excluded as it appeared to be misunderstood. Adding to that, some items could not be summarised using one to three words (e.g., 'I tend to feel like other people are probably happier than I am').

How is the term 'self' for the attributes handled?

In determining the appropriate concepts for the IAT in the context of self-compassion, a significant issue arises with the choice of the complementary category. While 'self' is a clear choice, using 'other' as the counterpart presents certain risks, especially considering that the attribute categories (compassionate vs. critical) may not distinctly contrast for 'self' and 'others.' Self-compassion is often conceptually bridged with the compassion we feel towards others, complicating the distinction between these categories. Printer and Greenwald (2005) emphasise the necessity of carefully interpreting the 'other' category to avoid ambiguity, as it might inadvertently merge the measurements of compassion towards oneself and others, rather than isolating self-compassion.

To address this issue, the study chose to omit the term 'self' when presenting the anchors of compassion and criticism. This approach aimed to reduce ambiguity and cognitive load for participants, ensuring that the construct of 'self' was targeted exclusively. If terms like 'self-compassion' and 'self-criticism' were used alongside the stimulus 'I', it would not distinctly belong to either anchor, thus complicating the interpretation. This strategy aligns with Greenwald and Farnham's (2000) methodology in their implicit assessment of self-esteem, where they did not use the term 'self' in attribute representation. By adopting this approach, the study aims to more accurately focus on self-compassion as a distinct aspect of the self-concept without the confounding influence of external comparisons.

Intuitive Pen and Paper Sorting Test

On paper with pen participants were asked to categorise 20 selected stimuli to either compassion, criticism, or ambiguous, which led to an exclusion of seven stimuli. One item was

revised in collaboration with the participants and included in the final set of stimuli. These were based upon specific inclusion rules, which included employing easily understandable language and ensuring that the meanings were mutually exclusive. 14 stimuli were finalised, with half of them linked to the positive anchor 'compassion', three for self-kindness, two for common humanity, and two for mindfulness, and the other half to the negative anchor 'criticism,' comprising three words for self-judgment, two for isolation, and two for overidentification (Table 2). Initial and final stimuli can additionally be found in the Appendix.

Methods Study 2

Design

A psychometric study was conducted to answer research questions and test hypotheses regarding the development of an innovative tool to measure self-compassion implicitly using the SC-IAT. Reliability and validity of the SC-IAT was assessed by instrumentalising a two-wave study, with a minimum time interval of four days between assessments.

Participants

A total of 100 participants were recruited for the study using convenience sampling, a non-probability sampling method chosen for its practicality and efficiency. Participants were primarily recruited through informal contacts, including relatives and friends, who were approached through social messaging platforms. This recruitment approach was preferred due to the likelihood of higher participation rates owing to the personal connection between the researcher and the participants. Additionally, the Sona Credit System of the University of Twente (UT) was utilised as a secondary recruitment method. Under this system, UT students were offered participation in the study in exchange for 1 credit, which contribute towards the completion of their bachelor's degree in social sciences. Eligibility criteria for participation

Table 2

Final Stimuli to be Used in the SC-IAT per Dimension of the SCS

Positive Anchor: Compassion		**Negative Anchor: Criticism**	
Final Stimuli	*Dimension of the SCS*	*Final Stimuli*	*Dimension of the SCS*
Loving	K	Judgment	J
Kindness	K	Cold-Hearted	J
Tolerance	K	Intolerance	J
Shared Struggles	CH	Isolation	I
Shared Feelings	CH	Sense of Inferiority	I
Balanced Emotions	M	Fixation on Flaws	OI
Balanced Perspective	M	Consumed by Inadequacy	OI

Notes. K = Kindness, CH = Common Humanity, M = Mindfulness, J = Judgment, I = Isolation, OI = Over-Identification

included being at least 18 years old, fluent in the English language, a stable internet connection and access to a phone or computer.

Materials

Explicit Measures

      Almost Perfect Scale Revised (APSR). The Almost Perfect Scale Revised, measuring perfectionistic tendencies, consists of 24 items divided into three subscales: seven for standards, four for order, and thirteen for discrepancy, using a 7-point Likert scale (1 = Strongly Disagree, 7 = Strongly Agree). Rice and Ashby (2007) describe scoring by subscale sums, with adaptive perfectionists scoring above 42 in standards and maladaptive perfectionists identified by discrepancy scores over 42. Self-Compassion Scale (SCS) scores show a moderate negative correlation with the discrepancy subscale ($r = -.57$, $p < .01$) but are not significant with standards (Neff, 2003).

      Five-Facet Mindfulness Questionnaire Short Form (FFMQ-SF). The Five-Facet Mindfulness Questionnaire Short Form (FFMQ-SF) was utilised to assess mindfulness in participants, who rated 24 items across five subdimensions, namely non-reactivity, observing, act with awareness, describing, and non-judgmental, on a 5-point Likert Scale from 1 (Never or very rarely true) to 5 (Very often or Always true). Final scores were aggregated for analysis. Svendsen et al. (2020) report that SCS scores have a moderate positive correlation with FFMQ-SF aggregated scores ($r = .68$, $p < .01$).

      Ruminative Response Scale Short Form (RRS-SF). To measure ruminative tendencies in participants, the Ruminative Response Scale Short Form (RRS-SF) was used. Participants rated on a 4-point Likert Scale ranging from 1 (Almost never) to 4 (Almost Always) how often they engage in certain ruminative related behaviours. The questionnaire is composed of 22 items in total and summed to calculate final scores. According to Neff (2003) SCS scores correlate in a moderate and negative magnitude with the sum scores of the RRS-SF ($r = -.05$, $p < .01$).

      Self-Compassion Scale (SCS). The Self-Compassion Scale (SCS) in English was used to measure explicit self-compassion, asking participants to rate 26 items on a 5-point Likert scale from 1 (Almost never) to 5 (Almost always). The scale includes the Self-Kindness subscale with ten items (half reverse-coded), and the Common Humanity and Mindfulness subscales, each with eight items (half referring to Isolation and Over-identification, respectively, requiring reverse coding). Total scores, indicating higher self-compassion with greater sums, demonstrated good internal consistency $\alpha = .92$ overall, subscales $\alpha = .75$ to .81 (Neff, 2003). The SCS is compared to the SC-IAT to explore their correlation, as they assess self-compassion

at different levels. It is assumed that they correlate to some degree with each other (Greenwald et al., 2021).

The Social Connectedness Scale Revised (TSCS-R). The 20-item Social Connectedness Scale Revised (TSCS-R) was employed to measure how close participants view themselves in relation to others. Respondents rated their agreement to the 20 items on a 6-point Likert scale ranging from 1 (Strongly Disagree) to 6 (Strongly Agree). According to Neff (2003) scores from the SCS correlate positively and moderately with the sum scores of the TSCS-R ($r = .41$, $p < .05$).

Trait Meta Mood Scale 24 (TMMS-24). The Trait Meta Mood Scale 24 (TMMS-24) is used to measure differences in the ability to mange one's emotions and contains three subscales representing the essence of emotional intelligence. Attention, Clarity and Repair, whereby each subscale is represented by eight items, which are rated on a 5-point Likert Scale ranging from 1 (Strongly Agree) to 5 (Strongly Disagree). Higher scores indicate a better ability to reflect upon one's emotions (Neff, 2003). According to Neff (2003) the SCS positively and moderately correlates with the Repair subscale ($r = .55$, $p < .05$) and low with the Clarity subscale ($r = .43$, $p < .05$), whereby the Attention subscale yields a weak correlation ($r = .11$, $p < .05$).

Positive Affect (State Measure)

To assess momentary positive affect of respondents, three items measuring state affect were included. Those were ranked on a 7-point Likert scale, ranging from 1 (Not at all) to 7 (Very much). Items used in this study were commonly used in different studies (Geschwind et al., 2011; Jans-Beken et al., 2019). State positive affect was measured by asking *"How 'joyful', 'content', 'happy' do you feel right now?"* separately. Scoring high indicated that participants experienced more intense positive emotions before taking the SC-IAT.

Single-Category Implicit Association Test to Measure Implicit Self-Compassion

In total four blocks, whereby two represented training blocks, were implemented in the SC-IAT (Karpinski & Steinman, 2006). The category 'Me' was represented with the commonly used words 'Myself', 'I', 'Mine', and 'Me'. Table 3 visualises the blocks and the combination of the anchors with the category per block. In the SC-IAT, the presentation order of the stimuli was randomised to ensure unbiased responses. Each stimulus appeared with equal frequency, allowing for a maximum deviation of one in cases where the total number of stimuli presentations could not be evenly divided. Furthermore, care was taken to ensure that no stimulus was repeated consecutively.

Table 3

Category Assignment and Stimulus Proportions across the SC-IAT Blocks

Block	Trials	Function	Left-Key Response	Right-Key Response
1	24	Practice	Me or Compassion	Criticism
2	72	Test	Me or Compassion	Criticism
3	24	Practice	Compassion	Me or Criticism
4	72	Test	Compassion	Me or Criticism

Procedure

Upon obtaining approval from the Ethics Committee of Behavioral, Management, and Social Sciences at the University of Twente (#231024), the SC-IAT stimuli and questionnaires were implemented into the online platform of soSci (https://www.soscisurvey.de/). SoSci serves as a digital survey tool with the added capability of designing and conducting IATs, ensuring both high data privacy and user-friendly layout (https://www.soscisurvey.de/de/about).

Following the implementation, a five-day pilot study was conducted to evaluate email triggers, identify potential problems, and assess the functionality of questionnaires and the IAT as intended. Subsequently to the pilot phase, participants were invited to the soSci platform by offering them the study code or the direct study link. Upon reaching the platform, participants were presented with information about the research's objectives and their rights as participants. Before proceeding participants were required to agree to the informed consent. Throughout the first phase of the study, respondents were able to pause the interview at any time by clicking on the pause button and enter their email. They then received the link to their study and the progress was saved.

Following this, demographic information such as age, gender, education, and nationality was collected. The APS-R, FFMQ-SF, and RRS-SF questionnaires were presented individually. After completing these sections, a break reminder was displayed, offering participants an opportunity to take a break if desired. Subsequently, the SCS, TSCS-R, TMMS-24, and MHC-SF questionnaires were presented separately. Following the questionnaire sections, the SC-IAT was initiated and concluded by inquiring about the type of device used and the participant's current positive affect. Participants received an email four days later, prompting them to repeat the SC-IAT and answer questions about the device used and their current positive affect. In cases where participants did not engage with the provided email link, a reminder email was sent five days after completing the initial SC-IAT.

Data Analyses

Data imported from SoSci into IBM SPSS Statistics 28 underwent preliminary processing. Irrelevant variables were removed for focused analysis. Cases were considered

invalid and subsequently excluded under any of the following conditions: if more than 10% of responses were faster than 350ms, if incorrect answers exceeded 20%, or if, after applying these criteria, fewer than three reaction times per block remained (Karpinski & Steinman, 2006).

For the purpose of answering the research questions, the d-score from the first assessment (T1) and second assessment (T2) were utilised.

RQ1: To assess test-retest reliability, corrected bivariate correlation using Pearson's coefficient was employed. This involved correlating d-scores from the first assessment (T1) with those from the second assessment (T2). Following the proposed rules of Greenwald et al. (2020) bivariate correlations were adjusted by using Spearman-Brown correction as greater reliability is expected by increased repetitions. Different studies use test-retest reliability in IAT assessment effectively by correlating scores from two different time points (Greenwald & Farnham, 2000; Bar-Anan & Nosek, 2013). The SC-IAT specifically showed questionable test-retest scores ranging from .21 to .48 (Bar-Anan & Nosek, 2013; Bluemke & Friese, 2008), however, similar to scores of the standard IAT (r = [.43; .68]).

RQ2: Internal consistency was evaluated using three d-scores from the SC-IAT, split into thirds during T1 and analysed separately, named as split-third reliability in the current study (Karpinski & Steinman, 2006). Pearson's r was calculated, averaged, and adjusted with the Spearman-Brown correction to address underestimation from the third-split method, aligning the results with Cronbach's alpha for direct comparison (Karpinski & Steinman, 2006). Expected scores typically range between .61 and .69 (Bluemke & Friese, 2008; Karpinski & Steinman, 2006).

RQ3: To assess concurrent validity, Pearson's coefficient was used for bivariate correlation, comparing the d-score with the mean score of the SCS and its six subscales from T1. This method, grounded in the belief that closer temporal assessments yield stronger construct correlations (Shuttleworth, 1980), underscores the SC-IAT's utility in measuring self-related concepts like self-esteem, marked by its high internal consistency (Bluemke & Friese, 2008; Karpinski & Steinman, 2006). However, nuances in application must be acknowledged. Bar-Anan and Nosek (2013) highlight that the SC-IAT, while robust, may not match the traditional IAT's sensitivity, leading to exchange the provided sensitivity with the possibility of the SC-IAT's one-target assessment.

RQ4 and Subsequent Hypotheses: To answer RQ4 and test the related hypotheses, adjusted Pearson's coefficient was used for bivariate correlations, averaging d-scores from T1 and T2 and correlating these with scores of explicit measures from T1. Despite expectations of stronger correlations with assessments conducted closer in time, Greenwald et al. (2020) note

that initial IAT administrations often show lower reliability, improving with subsequent measurements. Aggregating d-scores from multiple administrations enhances the validity and correlation strength with empirically related constructs. While constructs typically correlate with explicit measures, IAT or SC-IAT measures may only weakly correlate with them due to different cognitive processing levels, with IATs focusing on implicit processes and explicit measures on conscious attitudes and beliefs (Greenwald et al., 2020; Greenwald et al., 2021; Hogenboom et al., 2023).

RQ5: Seven moderation analyses in a linear regression model were employed to assess whether the device type used during the assessment moderated the association between d-scores on SCS scores and its subscales. Hereby, d-scores from T1, device type used during T1 as well as their product were included as independent variables, while each of the empirically related constructs were classified as dependent.

RQ6: Two linear regression analyses were employed to determine whether state positive affect influenced d-scores during T1 and T2 separately. These analyses allowed to evaluate the extent to which changes in state positive affect (as independent variable) were associated with changes in d-scores (as dependent variable).

To ensure transparency, different correlations were denoted as followed: r_P = unadjusted Pearson's correlation, adj r_P = adjusted Pearson's correlation using aggregated d-scores, r_S = Spearman-Brown Correction. Following the proposed rules by Schober et al. (2018) Pearson Correlation as well as Spearman-Brown correction were considered as followed: $r_P / r_S < .1$ = negligible; $r_P / r_S = .1 - .39$ = weak; $r_P / r_S = .4 - .69$ = moderate; $r_P / r_S = .7 - .89$ = strong; $r_P / r_S > .9$ = very strong.

Results Study 2

In total 100 participants volunteered in the study, however 33% ($n = 33$) cases were excluded from further analysis by following the proposed rules of Karpinski and Steinman (2006). An additional 5 participants (5%) were excluded from the study due to inconsistent device usage as they did not consistently use the same device for the SC-IAT across both T1 and T2 sessions. Thus, 62% ($N = 62$) valid cases were included in further exploration.

The age ranged from 18 to 27 ($M = 21.1$, $SD = 2.45$). Most respondents identified as female (77.4%) and reached their Bachelors degree (85.5%). PC (72.6%) was used more than twice as often as Phone (27.4%) during SC-IAT assessments. Detailed participant information can be found in Table 4. Other nationalities included: Belgian, Bulgarian, Finnish, French, Indian, Lithuanian, Polish, Romanian, Russian, and United States.

Table 4

Sample Characteristics (N = 62)

		n	*%*
Gender	Female	48	77.4
	Male	13	21
	Non-Binary	1	1.6
Nationality	Dutch	20	32.3
	German	27	43.5
	Other	15	24.2
Education	High School	2	3.2
	Bachelor	53	85.5
	Master	6	9.7
	HBO-associate	1	1.6
Device Type	Phone	17	27.4
	PC	45	72.6

Test-Retest Reliability

As anticipated, a moderate positive correlation was observed between the SC-IAT d-scores from the first and second measurement points (r_S = .51; r_P = .34, p = < .01) indicating a consistent level of implicit self-compassion over an interval of at least four days. This correlation was evident across both device types combined. Contrary to assumption, when comparing the results by device, the correlation among PC users (r_S = .39; r_P = .24, p = .12) was not significant and weaker in comparison to phone users, where a stronger and significant correlation was found (r_S = .59; r_P = .74, p < .05). Further analysis using z-statistics to compare the test-retest reliability coefficients (r_p) between phone and PC assessments yielded significant results. The z-test statistic was found to be 2.29, indicating a significant difference between the two groups (p < .05).

Internal Consistency

As hypothesised, the SC-IAT administered during T1 showed reasonable internal consistency (r_S = .6; α = .59) when considering both device types combined. Similar to test-retest reliability, however, by analysing device types individually, the internal consistency for the SC-IAT completed via PC was not significant (r_S = .43; α = .42, p > .05), and it was comparatively weaker than the results obtained from phone assessments (r_S = .81; α = .8). This contradicts the hypothesis made. Further analysis using t-statistics to compare the alpha values between phone and PC users yielded significant results. The t-test statistic was found to be 4.19, indicating a significant difference between the two groups (p < .05).

Concurrent Validity

Contrary to initial expectations, the SC-IAT's d-scores did not demonstrate a significant correlation with the mean scores of the Self-Compassion Scale (SCS), nor with its individual dimensions. This finding was particularly notable given, that the explicit measures of the SCS exhibited significant, strong, and positive correlations as shown in Table 5. However, an interesting aspect emerged in the bivariate correlations between the SC-IAT and the SCS dimensions. While these correlations were mostly positive in magnitude, their significance levels varied, ranging from $p = .08$ (Judgment) to $p = .85$ (Mindfulness), while the latter additionally was negative in magnitude.

Convergent Validity

Consistent with previous findings, the explicit measures displayed significant and stronger correlations among each other, as detailed in Table 6. Contrary to expectations, the SC-IAT did not exhibit significant correlations with mindfulness, emotional intelligence, social connectedness, or maladaptive perfectionism. In contrast, the explicit measures significantly correlated with these constructs in the anticipated directions.

In line with expectations was the weak and negative correlation of SC-IAT with rumination scores (adj $r_P = - .32, p < .01$), although the SCS showed stronger correlations ($r_P = - .7, p < .01$), while being insignificant during the initial assessment ($r_P = - .21, p = .1$).

During T1, r_P between d-scores and both mindfulness and emotional intelligence were negative and negligible to weak in magnitude. However, a notable shift occurred when examining adjusted r_P, as aggregated d-scores and scores of mindfulness and emotional intelligence turned positive, but staying negligible in magnitude.

Moderation Effect of Device Type

Against initial assumptions, the type of device used during the SC-IAT assessment did not significantly moderate the relationship between d-scores and measures of self-compassion (Table 7). The change in the relationship between standardised d-scores and standardised SCS scores from computer to phone is not therefore not significant ($p = .19$).

Table 5

Mean, Standard Deviation, and Inter-Correlations among SC-IAT d-score and SCS and its Subscales Obtained During T1 (N = 62)

Variable	*M*	*SD*	1	2	3	4	5	6	7
1. d-score T1	0.18	0.35							
2. SCS Mean	2.93	0.81	.15						
3. Kindness	2.97	0.96	.16	.85**					
4. Judgment	2.77	0.99	.22	.9**	.7**				
5. Common Humanity	3	0.9	.06	.7**	.65**	.41**			
6. Isolation	2.91	1.2	.08	.8**	.47**	.77**	.38**		
7. Mindfulness	3.14	0.85	- .03	.84**	.76*	.65**	.7**	.52**	
8. Over-Identification	2.79	1	.17	.86**	.6**	.8**	.46**	.72**	.67**

*** p < .01.*

Table 6

Mean, Standard Deviation, and Inter-Correlations among Aggregated d-score and d-score T1 with SCS, FFMQ-SF, State Positive Affect, TMMS,

SC, RRS, and APS (N = 62)

Variable	*M*	*SD*	1	2	3	4	5	6	7	8
1. Aggregated d-score	0.23	0.29	-							
2. d-score T1	0.18	0.35	-	-						
3. SCS Mean	2.93	0.81	.16	.15	-					
4. FFMQ Mean	3.1	0.52	.01	- .03	.81**	-				
5. TMMS Mean	3.5	0.51	.02	- .07	.54**	.65**	-			
6. SC Mean	4.15	0.92	- .01	.08	.51**	.46*	.48**	-		
7. RRS	51.71	13.05	- .3*	- .19	- .7**	- .56**	- .4**	- .43**	-	
8. APS (Standard)	36.98	6.4	- .11	- .19	- .25	- .01	.06	- .13	.23	-
9. APS (Discrepancy)	50.39	15.75	- .14	- .08	- .63**	- .43**	- .26*	- .31*	.59**	.33**

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

Table 7

Standardised and Unstandardised Estimates of Moderation Effect of Device Type (Computer-Based as Reference Group) on the Association of Standardised d-scores Obtained During T1 on Standardised Self-Compassion

						95% Confidence Interval	
Parameter	*ß*	*B*	*SE*	*t*	Sig.	Lower Bound	Upper Bound
Intercept		.01	.15	0.71	.94	- 0.29	0.31
d-score	- .01	- .01	.18	- 0.8	.94	- 0.37	0.34
Device Type	.01	.03	.29	0.1	.92	- 0.55	0.6
Interaction term[a]	.24	.35	.26	- 1.34	.19	- 0.17	0.87

[a] d-score T1 * Device Type

Table 8

Standardised and Unstandardised Estimates of Momentary Positive Affect on d-scores Obtained During T1 and T2 Separately

							95% Confidence Interval	
Dependent Variables	Parameter	*ß*	*B*	*SE*	*t*	Sig.	Lower Bound	Upper Bound
d-score T1	Intercept		0.26	0.16	1.67	.1	- 0.05	0.58
	Momentary Positive Affect T1	- .07	- 0.21	0.04	- 0.58	.57	- 0.1	0.05
d-score T2	Intercept		0.36	0.15	2.47	.02	0.07	0.65
	Momentary Positive Affect T2	- .08	- 0.2	0.03	- 0.61	.54	- 0.09	0.05

Association between State Positive Affect and d-Scores

Contrary to initial assumptions, state positive affect did not significantly associate with d-scores obtained during T1 or T2 when analysed separately. Counterintuitively, the regression estimates were negative in magnitude, contrary to the expected positive relationship (Table 8).

Discussion

The study aimed to evaluate the psychometric properties of an innovative tool for the implicit measurement of self-compassion, with the Self-Compassion Scale (SCS) guiding stimuli development. Validation involved both experts in positive psychology and laypersons to ensure stimuli clarity and relevance. Using the Single-Category Implicit Association Test (SC-IAT), the study first assessed reliability, observing moderate and significant corrected bivariate correlations between initial (T1) and subsequent (T2) measurements. Phone-based

assessments yielded stronger reliability than PC-based ones. PC-based assessments, however, demonstrated lower reliability. Pearson's correlation between SC-IAT d-scores and the SCS and its subscales as well as empirically related constructs showed insignificant results. In exploring moderation effects, the type of device used during the initial assessment did not significantly moderate the relationship between d-scores on SCS scores. Additionally, momentary positive affect did not significantly associate with d-scores during T1 or T2.

Reliability of the SC-IAT and Differences in Device Usage

Unadjusted correlations between T1 and T2 were lower, compared to the corrected correlations using Spearman-Brown formula, both – test-retest and internal consistency - yielded weak to moderate stability of scores. While these results may seem modest compared to explicit measures, they align with the expected stability range for (SC-)IAT assessments (Bluemke & Friese, 2008; Greenwald et al., 2020). Notably, IAT assessments often exhibit lower stability, expected to improve with repeated administrations. The Spearman-Brown formula suggests potential stability but underscores the need for empirical validation of these adjusted reliability estimates. Future research should include more than two SC-IAT administrations to confirm these estimates, crucial for verifying the SC-IAT's accuracy and reliability in measuring self-compassion and determining if reliability has been overestimated.

Notably, the difference in the reliability coefficients of computer-based and phone-based assessments differed significantly in favour of phone-based assessments. Thus, reliability not differentiating between phone and computer assessments in both – test-retest and internal consistency analyses – was enhanced due to the stronger reliability of phone-based assessments. Possible reasons might be differences in screen size, keyboard against swipe option, the freedom where the test has been taken or homogeneity in the small phone group, so that despite the fact that SC-IATs are usually performed on computers, the current study showed that results are more reliable on phones compared to computer. Nevertheless, the significant difference in the reliability estimates suggests that performance on different devices did not behave similarly in the assessment of implicit self-compassion.

The Implicitness of Self-Compassion and the Lack of Validity

The SC-IAT's lack of concurrent and convergent validity with explicit self-compassion and related concepts highlights the complexity of self-compassion. Although weak correlations between explicit and implicit measures were expected (Bluemke & Friese, 2008; Greenwald et al., 2020; Greenwald et al., 2021; Hogenboom et al., 2023), comparing the studies findings with other studies is challenging due to the complex nature of self-compassion, as opposed to more straightforward measurements like prejudices, which target specific attitudes or biases

(Bluemke & Friese, 2008). Self-compassion encompasses a wide array of internal processes, contrasting further with implicit self-esteem's focus on self-evaluation (Greenwald & Banaji, 1995; Greenwald et al., 2002). Unlike self-esteem, self-compassion includes not just self-relationships but additionally how individuals connect with the collective human experience and manage mindfulness and emotional states, as indicated in the if-then formulations in the explicit SCS (Neff, 2003), highlighting the abstractness of self-compassion. However, the insignificance of the results raises the question of the possible implicitness of self-compassion.

The abstract and complex nature of self-compassion complicates the assessment of its potential implicit component. While models such as the Reflective-Impulsive Model (RIM) propose that a single concept can operate across both conscious and unconscious levels, therapeutic approaches like Compassion Focused Therapy (CFT) and Mindful Self-Compassion (MSC) intentionally cultivate self-compassionate responses through consistent training (Germer & Neff, 2019; Gilbert, 2010). This emphasis on deliberate training prompts questions about whether self-compassion primarily exists as a meta-cognitive concept (Phillips et al., 2017), lacking an unconscious dimension. However, as some individuals naturally respond more self-compassionate towards themselves, the implicitness of self-compassion is not negated. The SC-IAT, while useful, may not be the ideal instrument for assessing implicit self-compassion. Future studies should focus on creating measures to assess interpretation biases in self-compassion by, for instance, using ambiguous scenarios. This approach would evaluate typical responses to difficult situations, aligning with the if-then formulations of the Self-Compassion Scale (SCS), where the 'if' will be the ambiguous scenarios.

Limitations, Future Research, and Implications

The demographics of the study's population presents factor that could have limited the outcomes. With a high number of students who are non-native English speakers, the familiarity and understanding of the stimuli become crucial. Greenwald et al. (2021) highlight the importance of using stimuli that are familiar to participants. The varying levels of English language proficiency among the sample could have impacted how the stimuli were perceived and interpreted, potentially contributing to the unexpected results and possibly yielding undesirable stimulus effects and might have effected the reliability of the current measure. This suggests a need for careful consideration of participant language proficiency and the use of linguistically accessible stimuli in future iterations of the SC-IAT and other implicit measures. Adding to that the homogeneity of the participants limits the generalisability of results to a broader population.

During the SC-IAT construction 'criticism' as the contrast to 'compassion' was chosen, based on Greenwald's et al. (2021) advice that valanced attributes suit attitude but not stereotype measurements. This choice, due to the perceived inherent positivity of self-compassion and negativity of self-criticism, might have skewed the studies results. Participants could have automatically matched words with 'compassion' or 'criticism' based on their positive or negative framing, not their actual relevance to self-compassion. This valence-based sorting rather than a true reflection of self-compassionate attitudes potentially led to confounding outcomes, indicating a limitation in the SC-IAT's design.

The stimulus selection phase aimed to reduce self-compassion's complexity into concise terms, drawing from the SCS. However, the transition from complex statements to stimuli yielded complications. For instance, using 'Sense of Inferiority' to represent criticism may have complicated categorisation for participants, as suggested by Bluemke and Friese (2006) findings on stimulus sets impacting implicit measure outcomes. Additionally, omitting 'self' in stimuli and relying on pre-test scenarios could make it difficult for participants to apply stimuli to themselves during the SC-IAT, given the complexity of self-related stimuli and 'if-then' scenarios of the SCS. Future research might therefore use the guidelines proposed by Greenwald et al. (2021) and Hogenboom et al. (2023) to employ a more extensive range of initial stimuli, moving beyond the pen-and-paper validation approach used in the current study. Alternatively, employing a different instrument, such as an ambiguous scenario test, could offer a more effective means of assessing self-compassion's implicit aspects rather than relying solely on an SC-IAT.

Additionally, the aggregation of d-scores from initial and final SC-IAT administrations to enhance bivariate correlations, following Greenwald et al. (2020)'s recommendations, may overestimate the studies results. This approach was intended to minimise random measurement error but did not consider that d-scores from T1 or T2 individually showed no significant correlations with explicitly assessed constructs. Aggregating d-scores may overestimate the validity of the findings, a critical factor in the SC-IAT's developmental phase where establishing accurate validity measures is from importance. Moreover, the use of the Spearman-Brown formula to correct for potential reliability underestimations from aggregation further complicates the interpretation of validity, suggesting a cautious approach to interpreting these aggregated validity findings.

To ensure uniform conditions for administering the SC-IAT in future studies, it is advisable to standardise the device used for the task. Greenwald et al. (2021) advocate for the use of PCs for such assessments, however, the current study showed potential in phone

assessments. No significant impacts of phone usage on the results were found, however, the potential influence of screen size and display opposed to keyboards, as well as pressing keys versus touching the attribute words, cannot be completely ruled out. It is important to acknowledge that completing the task on a phone may introduce variability that is less likely with PC-based assessments, as it cannot verified that for instance, touching the screen in the middle instead of left or right, categorises the stimuli into the intended category. Future research could concentrate on comparing the reliability of SC-IAT assessments conducted on smartphones and computers, recognising the smartphones' potential utility in (SC-)IAT studies.

The initial objective of this study was to utilise the SC-IAT to monitor shifts in cognitive biases towards self-compassion among participants engaged in cognitive bias modification (CBM) training. Unfortunately, this plan was disregarded due to technical complications with the smartphone application intended to use. Despite this setback, the development of an instrument capable of reliably and validly measuring self-compassion on an implicit level remains a significant achievement. Such an instrument not only facilitates the assessment of self-compassion but also opens the door to cognitive training focused on enhancing compassionate responses. Future research could conduct an experimental study combining CBM with the SC-IAT, aiming to enhance the SC-IAT's construct validity by observing potential shifts in cognitive biases. This approach would facilitate the development of interventions designed to increase self-compassion levels.

Conclusion

The SC-IAT emerges as an innovative tool for measuring self-compassion implicitly, demonstrating promising reliability compared to existing SC-IATs and traditional IATs, even without adjusted reliability estimates. However, the type of device used during assessments (phone vs. computer) significantly affected reliability, with phone-based assessments showing superior reliability. As an initial attempt to capture the potentially unconscious aspects of self-compassion, the SC-IAT makes a significant contribution to the field, offering new possibilities for research into self-compassion. Despite the studies strengths, the SC-IAT faced challenges in achieving convergence and concurrence with explicit measures of self-compassion and related constructs like mindfulness, emotional intelligence, social connectedness, and maladaptive perfectionism.

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Appendix

Initial Set of Stimuli Development

SCS-Item	IAT Stimuli	Kindness (K) or Judgmental (J)
I try to be loving towards myself when I'm feeling emotional pain.	Loving	K
When I'm going through a very hard time, I give myself the caring and tenderness I need.	Caring and Tenderness Meeting needs	K
I'm kind to myself when I'm experiencing suffering.	Kindness	K
I'm tolerant of my own flaws and inadequacies.	Tolerant	K
I try to be understanding and patient towards those aspects of my personality I don't like.	Understanding and patient	K
I'm disapproving and judgmental about my own flaws and inadequacies.	Judgmental	J
When times are really difficult, I tend to be tough on myself.	Criticism?	J
I'm intolerant and impatient towards those aspects of my personality I don't like	Intolerant, Impatient	J
When I see aspects of myself that I don't like, I get down on myself.	Deprecation	J
I can be a bit cold-hearted towards myself when I'm experiencing suffering.	Cold-hearted	J

Dimension of Common Humanity

SCS-Item	IAT Stimuli	Common Humanity (CH) or Isolation (I)
When things are going badly for me, I see the difficulties as part of life that everyone goes through	Shared struggles, universal challenged	CH
When I'm down, I remind myself that there are lots of other people in the world feeling like I am	Shared Emotions, Shared Experiences	CH

When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.	Shared feelings	CH
I try to see my failings as part of the human condition	Common Humanity, Universal Experience	CH
When I think about my inadequacies, it tends to make me feel more separate and cut off from the rest of the world.	Isolation, Detachment	I
When I'm feeling down, I tend to feel like most other people are probably happier than I am.	Happy?	I
When I'm really struggling, I tend to feel like other people must be having an easier time of it	Perceived Disparity → Sence of Inferiority	I
When I fail at something that's important to me, I tend to feel alone in my failure	Isolation	I

Dimension of Mindfulness

SCS-Item	IAT Stimuli	Mindfulness (M) or Over-Identification (OI)
When something upsets me I try to keep my emotions in balance.	Balanced Emotions	M
When something painful happens I try to take a balanced view of the situation	Balanced perspective	M
When I fail at something important to me I try to keep things in perspective	Context-awareness, Broad view	M
When I'm feeling down I try to approach my feelings with curiosity and openness.	Curiosity, Openness	M
When I'm feeling down I tend to obsess and fixate on everything that's wrong.	Fixate (on flaws)/Fixation	OI
When I fail at something important to me I become consumed by feelings of inadequacy.	Consumed by inadequacy	OI
When something upsets me I try to keep things in perspective	Perspective Management	OI
When something painful happens I tend to blow the incident out of proportion	Inflated response	OI