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Development and Validation of the Personal Susceptibility to PUA Scale and the Characteristic Manifestations of PUA Relationships Scale

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Abstract

Objective: To explore the relationship between personal traits and susceptibility to PUA within the Chinese cultural context, and to develop and validate a personal trait scale for PUA-susceptible individuals and a basic characteristic scale for PUA relationships. **Methods:** An initial questionnaire was developed through literature review, theoretical model construction, and survey administration. For the PUA-susceptible personal trait scale, 1188 adults were recruited as participants; for the PUA relationship characteristic scale, 1188 adults who had experienced or were currently in intimate relationships were recruited. Item analysis and exploratory factor analysis were conducted separately for each scale, followed by confirmatory factor analysis and reliability and validity testing for both scales. **Results:** Scale 1 (PUA-susceptible personal trait scale) comprised 4 dimensions with 20 items total, demonstrating good model fit indices: RMSEA=0.060, CFI=0.937, IFI=0.937, TLI=0.924, SRMR=0.042. Scale 2 (PUA relationship characteristic scale) comprised 6 dimensions with 29 items total: RMSEA=0.053, CFI=0.925, TLI=0.919, GFI=0.913, SRMR=0.059. Internal consistency reliability for the total scale and each dimension ranged from 0.779-0.909 for Scale 1 and 0.897-0.970 for Scale 2. **Conclusion:** Both the PUA-susceptible personal trait scale and the PUA relationship characteristic scale exhibit good reliability and validity, and can serve as measurement tools for research examining personal traits and susceptibility to PUA in the Chinese cultural context.

Full Text

Development and Validation of the Susceptibility to PUA Personality Traits Scale and the Characteristics Manifestation Scale of PUA Relationships

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Abstract

Objective: To explore the relationship between personal characteristics and vulnerability to PUA (Pick-up Artist) manipulation within Chinese cultural contexts, and to develop and validate two measurement instruments: a personality traits scale assessing susceptibility to PUA and a scale identifying characteristic features of PUA relationships. **Methods:** Initial questionnaires were developed through literature review, theoretical model construction, and survey methodology. The Susceptibility to PUA Personality Traits Scale was administered to 1,188 adults, while the PUA Relationship Characteristics Scale was completed by 1,188 adults with current or prior intimate relationship experience. Both samples underwent item analysis and exploratory factor analysis, followed by confirmatory factor analysis and comprehensive reliability and validity testing. **Results:** The Susceptibility to PUA Personality Traits Scale comprises 4 dimensions with 20 items, demonstrating excellent model fit: RMSEA=0.060, CFI=0.937, IFI=0.937, TLI=0.924, SRMR=0.042. The PUA Relationship Characteristics Scale contains 6 dimensions with 29 items, also showing strong fit indices: RMSEA=0.053, CFI=0.925, TLI=0.919, GFI=0.913, SRMR=0.059. Internal consistency reliability ranged from 0.779-0.909 for the personality traits scale and 0.897-0.970 for the relationship characteristics scale. **Conclusion:** Both scales demonstrate strong psychometric properties and are suitable for assessing individual vulnerability to PUA and identifying PUA relationship patterns in Chinese cultural contexts.

Keywords: personal characteristics, PUA, scale development, reliability, validity

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1.1 Overview of PUA

PUA, originally an acronym for “Pick-up Artist,” referred to individuals who underwent systematic training to practice and continuously improve their emotional intelligence (Katie J. M. Baker, 2013). However, as PUA techniques became widely adopted, their misuse has become increasingly prevalent, and PUA has evolved into a term synonymous with power acquisition and emotional manipulation in intimate relationships (Xia Jin, 2021). Although no universally accepted definition of PUA currently exists, problematic PUA behaviors have attracted significant attention due to their high harmfulness, strong concealment, and long-term effects. While these behaviors have drawn widespread concern, domestic research on PUA has remained largely at the qualitative level of descriptive analysis and interviews (Pan Xuming et al., 2020), lacking quantitative assessment tools for evaluating PUA behaviors and their psychological impact on victims.

1.1.1 PUA and Personal Traits

Literature review reveals that in intimate relationships, individual vulnerability to PUA victimization is closely linked to personality characteristics. Effective development of self-concept can significantly reduce susceptibility to influence or control by others, and research has shown that PUA victims exhibit diminished self-awareness and social alienation (Klein et al., 2023). Additionally, in-depth interviews with women who experienced parental absence during childhood indicate that this population is more vulnerable to PUA due to low self-esteem, insecure attachment, and submissiveness tendencies (Meng Liyan, 2020). Furthermore, attachment style positively correlates with PUA victimization in intimate relationships (Wang Lu, 2023). Based on these findings and previous semi-structured interview results (Xuan Bao, 2023), we developed a susceptibility scale encompassing self-concept (positive and stable dimensions), social behavior, and dependency on others (including anxious attachment and self-differentiation).

1.1.2 General Manifestations of PUA Behavior

Previous research has confirmed that unequal relationship power dynamics constitute a significant feature of psychological abuse in PUA relationships, with perpetrators achieving control by manipulating power status (Sweet, 2019; Chen Qi, 2020). Gaslighting aims to consolidate power by eroding an individual’s self-confidence and sense of order (Rietdijk, 2021). The widely accepted view posits that PUA’s mechanism focuses on implementing induction and control behaviors, beginning with establishing a controlling contract, followed by hierarchical observation and assessment to implement personalized manipulation tactics, and ultimately achieving emotional control through suppression and pacification (Liu Binzhi & He Bingbing, 2020). PUA perpetrators employ comprehensive “control” strategies targeting victims: on one hand, acquiring power within the intimate relationship to establish external control; on the other hand,

undermining partners' self-efficacy through devaluation, thereby affecting their perception of their inherent worth and reducing their self-regulation capacity to achieve "control" (Pan Xuming et al., 2020).

When conflicts of interest arise between two individuals in an intimate relationship, the most common resolution involves one party sacrificing their own interests to meet the other's needs and maintain the relationship (Van Lange et al., 1997). PUA perpetrators exploit this dynamic by activating victims' self-sacrifice motivations to satisfy their own needs, such as leveraging information asymmetry and exaggerating their own contributions to encourage sacrifice. Individuals in romantic relationships are concerned with fairness and experience guilt and shame when their contributions are less than their rewards (Chen Hong et al., 2019), a vulnerability that PUA techniques exploit to trigger "compensation psychology." When partners voluntarily relinquish their time, resources, personal preferences, and achievement goals to meet the PUA perpetrator's demands, the perpetrator reports higher relationship satisfaction. Research indicates that after acquiring actual power, PUA perpetrators become less willing to sacrifice their own interests and exhibit more selfish tendencies across various domains (Righetti & Visserman, 2018), while selfishness reduces personal involvement and helps perpetrators consolidate their higher power status (Wang Hao & Yu Guoliang, 2017), ultimately creating a cycle of power solidification.

Based on this analysis, we developed a multi-dimensional scale to identify PUA relationship characteristics, targeting the major dimensions of "relationship power," "efficacy undermining," and "sacrifice encouragement."

1.2 Purpose of Scale Development

In light of this context, this study aims to develop two scientifically rigorous and practical measurement instruments. The first scale measures individual traits that increase susceptibility to PUA influence, enabling risk assessment and early warning for potential victimization or unhealthy relationships through personality analysis. The second scale focuses on quantifying the characteristic manifestations of PUA relationships, assisting the public in identifying whether their intimate relationships exhibit PUA features and providing corresponding recommendations.

2.1 Participants

Initial Sample 1: Following literature analysis and theoretical model construction, we randomly distributed 445 questionnaires through Wenjuanwang, yielding 338 valid responses (75.96% validity rate), including 101 males and 237 females. The first half of the questionnaire (Scale 1) targeted general adults for personal trait assessment and included a logic check item. The second half (Scale 2) was administered to 262 adults with current or prior intimate relationship experience (80 males, 182 females). This sample participated in item analysis and exploratory factor analysis.

Sample 2: A total of 283 questionnaires were distributed through Wenjuanwang for exploratory factor analysis and item analysis, resulting in 169 valid responses (59.72% validity rate), including 50 males and 121 females. The selection criteria for Scale 2 participants remained consistent, yielding 126 participants (36 males, 90 females).

Sample 3: For item analysis, 534 questionnaires were distributed, producing 346 valid responses (64.79% validity rate), including 106 males and 240 females. The Scale 2 subsample comprised 246 participants (84 males, 162 females) selected under the same conditions.

Final Sample 4: For reliability and validity analysis, 1,888 questionnaires were distributed through Wenjuanxing. After applying the same screening criteria...

2.2 Scales

This study developed the *Susceptibility to PUA Personality Traits Scale*, encompassing four primary dimensions: positivity in self-concept, stability of self-concept, social relationships, and emotional dependency. The scale comprises 21 items rated on a 5-point Likert scale, with some items reverse-scored. Higher scores indicate greater susceptibility to PUA influence.

Additionally, we constructed the *PUA Relationship Characteristics Manifestation Scale*, which includes three major dimensions—relationship power, efficacy undermining, and sacrifice encouragement—further subdivided into six sub-dimensions, totaling 29 items. This scale also employs a 5-point self-rating system, where higher scores indicate greater similarity to PUA relationship characteristics.

2.3 Statistical Methods

This study utilized SPSS 26.0 for item analysis, reliability testing, exploratory factor analysis, standardization, and cutoff score development. R version 4.3.3 was employed for model construction and confirmatory factor analysis. Notably, we innovatively integrated UMAP (Uniform Manifold Approximation and Projection) dimensionality reduction technology for visualization in confirmatory factor analysis. As a manifold-based dimensionality reduction method, UMAP effectively captures key structural patterns in high-dimensional space (where each axis represents a participant), serving as a powerful complement to linear methods (McInnes & Healy, 2018). Items from the same dimension, due to high collinearity, should theoretically be adjacent in UMAP's low-dimensional space, while conceptually similar items should also exhibit proximity even if belonging to different dimensions.

2.4 Initial Scale Item Development

Through comprehensive literature analysis, this study established a theoretical model and clarified specific research questions. In designing the questionnaire,

we referenced established international scales concerning self-concept, attachment, social behavior, and intimate relationships, including but not limited to the Rosenberg Self-Esteem Scale (RSES) (Marsh et al., 2010), Core Self-Evaluation Scale (CSEC), Tennessee Self-Concept Scale (TSCS), Self-Concept Clarity Scale (SCC), Self-Acceptance Questionnaire (SAQ), Gross Emotion Regulation Scale (ERQ), Experiences in Close Relationships Scale (ECR), and Texas Social Behavior Inventory (TSBI). We also incorporated domestic questionnaires on sacrifice motivation and behavior, supplemented by items derived from qualitative research and media reports describing PUA relationship characteristics.

The initial personal traits scale assessed self-concept, attachment style, social behavior, and self-differentiation, while the relationship-level scale focused on power imbalance, psychological control, efficacy undermining, and sacrifice encouragement. After careful screening and revision, the preliminary questionnaire comprised 229 items—123 targeting personal traits and 106 focusing on relationship dynamics—rated using a 5-point Likert self-report format (1= “completely disagree” to 5= “completely agree”) (Jamieson, 2004). All participants completed Scale 1, while those with relationship experience completed both scales. Two attention-check items were included during administration to eliminate careless responders.

2.5 Cutoff Score Development

The Youden index is widely applied in medical screening to evaluate test validity, assuming equal harm from false-negative and false-positive rates (Fluss et al., 2005). Higher index values indicate superior screening effectiveness and authenticity. Given that false negatives may prevent timely detection of unhealthy situations, leading to more severe psychological harm, while false positives may cause excessive worry and disrupt normal life or relationship development, the Youden index serves as an excellent reference for establishing cutoff scores. This study adopted the diagnostic score corresponding to the maximized Youden index as the cutoff criterion.

3.1 Item Analysis

Initial Testing: After excluding participants under 18, those failing both verification questions, and outliers beyond three standard deviations from the mean, 338 valid questionnaires remained (with identical exclusion criteria applied subsequently). The questionnaire was divided into two sections, with participants in each section divided into high and low scorers based on total scores (top and bottom 27%, respectively). Independent samples t-tests and Cronbach’s α coefficient analyses identified 28 items that failed to reach significance between high and low groups ($p < 0.05$), resulting in their deletion. Scale 2 collected 262 valid questionnaires; after deleting non-significant items and modifying those with excessive discriminability that lacked validity screening effects, Scale 1 retained 66 items and Scale 2 retained 98 items.

Second Revision: Using high-low grouping, independent samples t-tests and Cronbach' s α assessments evaluated each item. Six items in Scale 1 failed to achieve significance ($p < 0.05$) or exhibited total correlations below $r > 0.4$, leaving 59 items without severely impacting Cronbach' s α . Scale 2 retained 75 items after equivalent deletions and adjustments.

Third Revision: Large-scale item streamlining was conducted, with confirmatory factor analysis and item evaluation performed using Sample 3 data. All items satisfied criteria of significant between-group differences ($p < 0.05$) or total correlations exceeding $r > 0.4$. Subsequent content modifications merged similar items, retaining only the most representative items. Following these adjustments, the final versions retained 21 and 29 items, respectively.

Fourth Revision: No items failed item analysis criteria. Further refinements were made based on three rounds of revision, incorporating the latest PUA research developments to update item content in both scales.

3.2 Exploratory Factor Analysis

Following initial item analysis, exploratory factor analysis was conducted on the initial sample. Items with factor loadings exceeding 0.5 across multiple dimensions, cross-loading items, items forming independent dimensions, and items with loadings below 0.5 on all factors were progressively eliminated through multiple rotations. Subsequent exploratory factor analysis on the refined sample yielded a KMO measure of sampling adequacy of 0.870 for Scale 1 and 0.940 for Scale 2, confirming suitability for factor analysis. Using principal component analysis with Kaiser normalized varimax rotation, factors with eigenvalues greater than 1 were extracted. Considering eigenvalues, scree plots, factor loadings, communalities, and theoretical structure, we established the following dimensions: Scale 1 comprises four factors—self-concept-positive, self-concept-stable, social behavior, and dependency on others; Scale 2 comprises six factors—relationship power-status consolidation, relationship power-control, efficacy undermining-value negation, efficacy undermining-responsibility attribution, sacrifice encouragement-approach, and sacrifice encouragement-avoidance. The dimensional structure of Scale 2 was derived from detailed qualitative analyses of PUA processes (Xuan Bao, 2023).

3.3 Reliability Testing

Using Sample 4 ($n = 1,188$), reliability and validity were assessed. Scale 1 demonstrated an overall Cronbach' s α coefficient of 0.909, with all dimension reliabilities exceeding 0.779. Scale 2 achieved an overall Cronbach' s α of 0.970, with dimension reliabilities all surpassing 0.897. Dimension-specific reliabilities are presented in Tables 1 and 2.

Table 1 Reliability Coefficients for the Susceptibility to PUA Personality Traits Scale ($n = 1,188$)

Table 2 Reliability Coefficients for the PUA Relationship Characteristics Manifestation Scale (n=1,188)

3.4.1 Structural Validity

Figure 2 [**Figure 2: see original paper**] presents the confirmatory factor analysis model for Scale 1 (n=1,188). The KMO adequacy index reached 0.932. Model construction using the lavaan package in R version 4.3.3 yielded the following fit indices: RMSEA=0.060, below the conventional acceptance threshold of 0.08; CFI, IFI, NFI, and TLI were 0.937, 0.937, 0.924, and 0.928, respectively, all exceeding the conventional standard of 0.9; and the standardized root mean square residual (SRMR) was 0.042, significantly below the 0.05 acceptance threshold. These results collectively demonstrate excellent structural validity for Scale 1. The chi-square to degrees of freedom ratio (χ^2/df) reached 5.221, though this index is not interpretable due to the large sample size.

As shown in **Figure 1** [**Figure 1: see original paper**], UMAP dimensionality reduction results reveal significantly greater distances between dimensions than within dimensions, further supporting Scale 1's structural validity.

For Scale 2, the model structure is depicted in **Figure 3** [**Figure 3: see original paper**]. Confirmatory factor analysis revealed a KMO adequacy index of 0.982. Using the lavaan package in R version 4.3.3 and incorporating total personal trait scores as a covariate to account for how individual characteristics significantly influence relationship development within social interactions, we obtained the following fit indices: RMSEA=0.053, significantly below 0.08; CFI, IFI, NFI, and TLI were 0.950, 0.950, 0.935, and 0.943, respectively, all exceeding the 0.9 standard; and SRMR=0.034, well below the 0.05 threshold. The χ^2/df ratio was 4.294, though again not highly interpretable due to large sample size. These data effectively demonstrate excellent structural validity for Scale 2, with UMAP results similarly confirming its superior structural properties (**Figure 4** [**Figure 4: see original paper**]).

3.4.2 Criterion-Related Validity

Using Sample 4, Pearson correlation analysis was conducted between dimensions of the Susceptibility to PUA Personality Traits Scale and the PUA Relationship Characteristics Manifestation Scale. As shown in **Table 3**, multiple dimensions exhibited significant positive correlations ($P < 0.001$). The total correlation between the two scales reached $r = 0.523$ ($P < 0.001$), indicating a highly significant relationship.

Table 3 Correlations Between Subscales of the Susceptibility to PUA Personality Traits Scale and the PUA Relationship Characteristics Manifestation Scale (n=1,188)

3.5 Development of Diagnostic Cutoff Scores for PUA Relationships

Based on Sample 4 ($n=1,188$), Scale 1 scores approximated a normal distribution ($M=65.96$, $SD=14.51$), while Scale 2 scores showed a bimodal distribution ($M=82.54$, $SD=28.21$). For Scale 2 cutoff development, participants were asked, “In this relationship, do you suspect that you have experienced PUA?” as a binary dependent variable, with Scale 2 scores as the independent variable in a logistic regression model. The ROC curve (**Figure 5 [Figure 5: see original paper]**) yielded an area under the curve of 81.1% ($SE=0.013$, 95% $CI=[0.785, 0.837]$), with model significance $p<0.001$, indicating strong predictive capability. The Youden index reached its maximum value of 0.516 at a diagnostic score of 76.5. The “Yes” response group had a mean score of 95.71 ($SE=23.15$). Additionally, three participants confirmed as PUA victims through in-depth interviews had a mean Scale 2 score of 115.33.

Based on these results, the following cutoff categories were established for Scale 2: scores below 76.5 indicate no PUA risk; 76.5–95 indicate low-risk suspected PUA relationships; 95–110 indicate moderate-risk suspected PUA relationships; 110–125 indicate high-risk suspected PUA relationships; and scores of 125 or above, when answered truthfully, strongly suggest the presence of PUA or other unhealthy relationship patterns. It is emphasized that these scales and cutoffs serve only as personal warning and reference tools and cannot replace professional assessment. Accurate diagnosis requires comprehensive consideration of both partners’ actual circumstances and genuine feelings within the relationship.

Discussion

This study developed two scales from individual trait and intimate relationship perspectives to assess risk of PUA victimization and identify PUA behavioral characteristics. The Susceptibility to PUA Personality Traits Scale serves an early warning function, helping individuals identify personal risk factors for PUA victimization, while the PUA Relationship Characteristics Manifestation Scale diagnoses whether an intimate relationship exhibits PUA behavioral risks. Both scales demonstrate strong psychometric properties and high practical value.

Scale 1 examines how self-concept, social competence, and emotional attachment relate to PUA vulnerability. Self-concept includes positive and stable sub-dimensions, reflecting overall self-evaluation and cognitive stability. Emotional dependency encompasses anxious attachment and self-differentiation, representing dependence and differentiation levels in intimate relationships. Confirmatory factor analysis confirmed strong structural validity. Criterion-related validity further revealed that negative self-concept (particularly instability) and high emotional attachment constitute risk factors for PUA victimization, consistent with previous findings identifying low self-esteem and insecure attachment as high-risk factors. Notably, while the social relationships dimension achieved acceptable Cronbach’s α above 0.75, it did not reach excellent levels, possi-

bly due to high heterogeneity and insufficient item numbers rather than poor item quality (Tavakol & Dennick, 2011). Importantly, this scale does not establish diagnostic cutoffs for personal characteristics, as traits only increase PUA risk rather than directly causing victimization. Whether victimization occurs depends on multiple factors including life circumstances, interpersonal relationships, and opportunities. Previous research (Caspi & Moffitt, 1993) proposed a paradoxical theory of personality coherence, suggesting individual traits manifest consistently only in specific environments, highlighting the need to consider person-environment interactions when understanding PUA victimization risk. Therefore, Scale 1 primarily serves a warning and reference function rather than diagnosing victim status; personal traits themselves are not pathological and require no diagnosis. This scale helps identify individual vulnerability factors, informing prevention and intervention strategies.

Notably, social relationship scores only showed low correlations with status consolidation in relationship power and value negation in efficacy undermining, suggesting PUA perpetrators primarily target individuals with poor self-concept and heavy emotional attachment rather than basing selection on social competence. Social relationships appear to have minimal impact on PUA relationship development. Another noteworthy point is that attachment style was not established as a separate dimension but incorporated into emotional dependency, likely because anxious attachment and self-differentiation reflect the same intimate relationship attachment tendency in measurement.

Scale 2 examines whether PUA relationship status can be identified through relationship power, efficacy undermining, and sacrifice encouragement. Based on theoretical research and factor analysis, we established these three major dimensions. The “relationship power” dimension is subdivided into “status consolidation” and “control behaviors,” reflecting perpetrators’ power advantages and controlling actions. Research by Farrell and Petersen (2010) on how power and control function in intimate relationships provided theoretical foundation for this dimension. The efficacy undermining dimension includes value negation and responsibility attribution, demonstrating how perpetrators destroy partners’ self-efficacy through devaluation and blame. Sprecher et al. (2006) noted that emotional investment imbalances in intimate relationships often require the lower-power party to contribute more, a dynamic that PUA perpetrators exploit to strengthen control. Future research should further explore the power dynamics and sociocultural roots underlying PUA behaviors. The sacrifice encouragement dimension comprises approach and avoidance sacrifice subdimensions, reflecting perpetrators’ tactics for inducing and reinforcing partners’ self-sacrifice. Impett et al. (2005) discussed the costs and benefits of sacrifice in intimate relationships, highlighting the importance of this dimension in assessing PUA relationships. Confirmatory factor analysis demonstrated strong structural validity, while UMAP results suggested that approach and avoidance sacrifice strategies could potentially be merged, consistent with their belonging to the same major dimension.

Both scales exhibit strong psychometric quality, confirming theoretical construct validity and operationalization. According to Hu and Bentler's (1999) proposed cutoff criteria for structural equation model fit indices, our confirmatory factor analysis results achieved good fit levels, providing robust support for the scales' structural validity. Notably, because the initial and final versions differed substantially in item number and content, the initial exploratory factor analysis served only as a reference for dimension division and subsequent item revision, not as a rigid criterion for final factor structure. Final dimension development emphasized existing research, so the initial factor-item relationships were not used to validate the final factor-item structure.

However, several limitations must be acknowledged. First, the study primarily employed self-report questionnaires, which may be subject to participant bias and social desirability effects. Future research could incorporate peer ratings and behavioral observation to enhance objectivity and accuracy. Second, all samples were drawn from Chinese cultural contexts—while this represents a distinctive strength, it also means the scales' cross-cultural applicability requires further investigation. Given that PUA behaviors may manifest differently and show varying susceptibility across cultures, validation and cross-cultural comparison in diverse cultural contexts represent important future directions.

Additionally, this study employed a cross-sectional design, primarily examining correlations rather than establishing causality. The relationship between personal traits and PUA victimization risk may be bidirectional rather than unidirectional. Longitudinal or experimental designs in future research could reveal deeper, dynamic causal relationships. Regarding diagnostic cutoffs, although this study established preliminary thresholds based on ROC curves and the Youden index, their stability and applicability require cross-validation across different samples and practical application testing.

Despite these limitations, the two scales developed in this study demonstrate strong psychometric properties and provide valuable measurement tools for PUA research. Future studies should expand sample representativeness, diversify measurement methods, conduct cross-cultural validation, and further revise the scales based on practical application effects to enhance utility and generalizability.

Conclusion

The Susceptibility to PUA Personality Traits Scale and the PUA Relationship Characteristics Manifestation Scale demonstrate excellent reliability and validity, meeting the requirements of both indigenous cultural contexts and statistical testing. The former contains 20 items across 4 dimensions, providing an assessment tool for researching individual traits and PUA vulnerability in Chinese cultural contexts. The latter comprises 29 items across 6 dimensions for evaluating whether a relationship exhibits PUA characteristics. Using cutoff scores of 76.5, 95, 110, and 125 to delineate varying PUA risk levels, these scales provide

important measurement tools for future PUA research and prevention, identification, and intervention efforts, offering substantial theoretical and practical value.

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Appendix 1: Susceptibility to PUA Personality Traits Scale

Dimension 1: Self-Concept–Positivity 1. *I feel I have many strengths and advantages* 2. *I feel I can succeed in life* 3. *I have things to be proud of* 4. *Overall, even with flaws, I am satisfied with myself* 5. *I believe the opposite sex would definitely like me*

Dimension 2: Self-Concept–Stability 6. My view of myself may be one thing today and another tomorrow 7. I usually find it difficult to make decisions because I don't really know what I want 8. I never dare to express my inner desires 9. I always worry I'm not good enough and will be criticized or blamed by others 10. I always worry about making others unhappy 11. I always worry about embarrassing myself in front of others 12. When what I want to do isn't approved by others, I become very worried

Dimension 3: Social Relationships 13. *I am always at ease in crowded situations* 14. *I have many friends* 15. *I feel relaxed when with many people*

Dimension 4: Emotional Dependency (Anxious Attachment + Self-Differentiation) 16. I somewhat worry about losing my romantic partner 17. I worry my partner won't care about me as much as I care about them 18. I worry about being abandoned 19. If my partner isn't with me as much as I hope, I feel discouraged 20. If I can't get my partner's attention and care, I feel upset or angry 21. When my partner and I are very close, I worry and fear losing them

(* indicates reverse-scored items)

Appendix 2: PUA Relationship Characteristics Manifestation Scale

I. Relationship Power

Dimension 1–Status Consolidation 1. Even in matters closely related to me, the other person considers themselves more 2. The other person does or makes me do things that make them feel good but make me feel bad 3. Their judgments about right/wrong and responsibility aren't influenced by my attitudes, thoughts, or feelings 4. Although they verbally express my importance, I feel unimportant and could be abandoned at any time 5. The other person is hot and cold, good and bad, leaving me uncertain how to respond 6. They complain to me or their friends about suffering in our relationship and my flaws, suggesting many better people exist 7. They frequently point out my friends' shortcomings or what dissatisfies them, making me distance from "bad" people

Dimension 2–Control 8. I need to report my whereabouts to them, but I cannot 介入 their life 9. They coerce or induce me to do things I don't want to do but dare not refuse 10. If I defy their demands, they become furious or

miserable 11. They frequently demand to see my phone or personal belongings (or even take some items) 12. If I leave them, they might not be able to live properly (or even self-harm or commit suicide)

II. Efficacy Undermining

Dimension 1—Value Negation 13. Sometimes I feel I' ve done well, but they still demand I reflect on myself 14. They frequently become inexplicably unhappy, making me feel I' ve done something wrong 15. When we disagree, they always say it' s because I' m incompetent

Dimension 2—Responsibility Attribution 16. They negate the significance of things I enjoy doing 17. They frequently distort or slander the meaning of my thoughts and behaviors 18. They speak badly of me or enumerate my flaws in public settings (in person or on social media) 19. I always feel frustrated in front of them, feeling inferior in many aspects 20. When we argue, they are never at fault 21. No matter what happens, they think it' s my problem 22. In our relationship, they are an innocent victim while I always “do wrong things”

III. Sacrifice Encouragement

Dimension 1—Approach Sacrifice 23. They think I' m not good enough, so I should work harder to make them look better 24. Some small things I “did wrong” become indelible stains in their eyes, requiring double effort to compensate 25. Sometimes I feel I don' t deserve them (or their efforts), so I use my own efforts to make up for it

Dimension 2—Avoidance Sacrifice 26. Sometimes their emotions become unusually intense, and I try to comply and cooperate due to guilt, fear, or anxiety 27. They constantly hint or remind me of their love for me, their specialness, how good they are, etc., making me feel I should be good to them 28. They carefully calculate and compare their contributions with mine 29. In their eyes, how much I do for them is very important

Note: Figure translations are in progress. See original paper for figures.

Source: ChinaXiv –Machine translation. Verify with original.