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APA Division 5 - Quantitative and Qualitative Methods

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## Extending Interpretive Phenomenological Analysis (IPA): Bringing Culture into Lived Experience Research

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### Elucidating qualitative research methodology to incorporate cultural scripts, social norms, and moral discourses

Rooted in the philosophical tradition of phenomenology and hermeneutics, Interpretive Phenomenological Analysis (IPA) emphasizes how individuals make sense of critical events in their lives. However, much of the scholarship applying IPA has been conducted in Western contexts, where the focus often rests on an egocentric view of lived reality. While its idiographic focus allows for an immersive, in-depth understanding of each participant's experience, as researchers from the Global South, we felt that it often underemphasizes the wider social habitus that human subjects are embedded in.

Our work as qualitative researchers and instructors in India has prompted us to ask: how might IPA, as formulated by Smith, Flowers and Laerkin (2009), be adapted to elucidate and interpret lived experience as deeply entwined with cultural scripts, social norms, and moral discourses? Through our study on women cosmetic surgery users in urban India, in the article, we will highlight how tenets and steps of IPA can be expanded to incorporate a cultural lens to understand their lived and affective experience of body alteration in the quest for beauty. This article is a summary of a working manuscript that details the discursive lens to the different stages of IPA research.

### The Study Context

Cosmetic surgery is often framed as a matter of personal empowerment and autonomy, constructed as a neoliberal project of bodily self-care (Leve et al., 2012). For many women in India, beauty is not only an aesthetic pursuit but also tied to family honor, marriage prospects, and class mobility (Patil et al., 2011). What was once a medical intervention for injury and repair now functions as a cultural tool for reshaping identity, desirability, and social belonging.

Fieldwork was conducted at a cosmetic surgery clinic in South Delhi, India. Over six months, we observed the clinic environment and carried out three rounds of semi-structured interviews with ten women undergoing procedures such as skin lightening, Botox, Liposuction, and Rhinoplasty. Aligning with the spirit of double hermeneutics, beauty as a personal construct for each participant was explored. Questions like “What does *fairness* mean to you?” “When you say you feel *confident* now, what does that feel like in your body?” was explored. Unsurprisingly, these words were used in varied and context-specific ways, shaped by participants’ age, life stage, relationships, aspirations, and socio-economic realities.

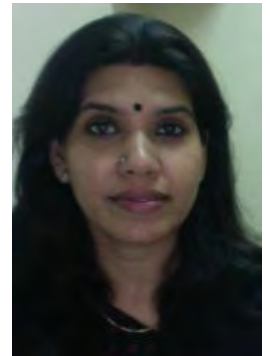
### Extending IPA through Culture

Drawing from our field notes, transcripts, and reflexive journals, we traced how participants invoked cultural scripts of family roles, marital norms, desire, beauty, etc. when speaking about their bodies and cosmetic choices. For example, participants frequently used terms like “*saawli si ladki*” (dusky girl), “*bold woman*”, “*graceful ageing*” and “*being presentable*”, expressions laden with cultural codes around desirability, deviance, and virtue. The cultural aspect was most evident at the linguistic level: idioms like *saawli* (dusky complexion), metaphors of “flawlessness,” or even the use of abusive words to express frustration revealed how cultural scripts shaped the emotional and moral stakes of beauty.

For example, one participant described being rejected in marriage proposals because of her skin tone, despite her education and career success. Her words linked complexion not only to attractiveness but also to perceptions of sexual morality (“bold”). Here, IPA’s layered commentary—descriptive, linguistic, conceptual—allowed us to show how personal distress was intertwined with India’s long-standing cultural preference for fairness, a discourse reinforced by media, kinship systems and global beauty economics.



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Table 1

Descriptive, Linguistic, and Conceptual Comments

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Excerpt                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <i>Again, it's about the complexion. I never gave much importance to my complexion earlier because it never bothered me. People stare at me because of my dark complexion and my big lips. I never wanted to defy these two things. These are my assets, identification marks, something, something. However, when I began searching for marriage proposals, people perceived my appearance as that of a "bold woman". (gesturing her hands as if to say the phrase bold woman in double quotes.).</i> |
| Descriptive comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Initially viewed dark skin and full lips as unique features; did not experience them as problems.                                                                                                                                                                                                                                                                                                                                                                                                      |
| Felt objectified by others but did not internalize their comments initially.                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Social perception begins to affect her self-image, especially in the marriage context.                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Linguistic comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Uses affirming phrases ("my assets," "identification marks"); repetition of "something" suggests ambivalence.                                                                                                                                                                                                                                                                                                                                                                                          |
| "Bold Woman" - placed in quotes and physically gestured – distances herself from the label.                                                                                                                                                                                                                                                                                                                                                                                                            |
| "Bold" in Indian discourse carries connotations of moral transgression, especially around sexuality; reflects intersection of complexion and character policing.                                                                                                                                                                                                                                                                                                                                       |
| Conceptual comments                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Conflict arises when individual meaning clashes with societal judgment.                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Marriage prospects connected to a woman's appearance.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Physical appearance connected with personality traits.                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Negotiating self-perception with cultural ideals.                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

IPA allowed us to explore how women navigated the felt dimensions of beauty, its pleasures, and pressures, while simultaneously appropriating, resisting, or complying with dominant ideals. This approach aligns with hermeneutic phenomenology as well as discursive traditions that foreground the role of language and culture in shaping subjectivity (Motta & Larkin, 2023).

Methodological Tensions in IPA

Conducting IPA in this context also meant grappling with several methodological dilemmas:

- **Reflexivity vs. bracketing** – As women researchers, our own practices of beauty colored how we related to participants. Rather than attempting to bracket these away entirely, we treated them as “reflexive echoes” that shaped interpretation (Goldspink & Engward, 2018). It helped us expand and critically examine our shared language of beauty and individual improvisations of the same.
- **Idiography vs. commonality** – The idiographic focus of IPA sometimes clashed with participants’ shared cultural experiences. By intentionally foregrounding culture at every step of the research, the study’s focus facilitated analysis of macro ideals and practices of beauty and desire for women, along with individual embodied experience.

- **Description vs. interpretation** – IPA is often criticized for straying too far from participants' words. Our strategy was to anchor each interpretive claim in textual detail while situating them in cultural frameworks (Tuffour, 2017), thereby keeping them closer to the spoken realities of the individual.

Over time, we came to see these tensions not as obstacles but as part of the labor of doing IPA. For us, IPA as a research process is less about resolving contradictions and more about dwelling in them.

### Key Takeaways for Researchers

From this study, the following lessons emerged for using IPA, especially in non-Western or cross-cultural contexts:

1. **Culture is not background** – Lived experience is always culturally embedded and to overlook this is to miss how meaning is socially produced.
2. **Language is a cultural resource** – Paying attention to idioms, metaphors and symbols provides deep insight into participants' lifeworlds.
3. **Reflexivity is ongoing** – Researchers' own embodied positions inevitably shape analysis. Acknowledging and expanding researchers' reflexive insights can enrich rather than dilute interpretation.
4. **IPA is adaptable** – While rooted in psychology, IPA can engage with sociological and cultural frames, making it a versatile method for global qualitative research.

### Conclusion

By extending IPA to incorporate cultural analysis, our study demonstrates how qualitative methods can illuminate the entanglement of self, society, and embodiment. In adapting IPA to non-Western settings, we not only expand its methodological toolkit but also open new ways of understanding how people live, narrate, and transform their lives.

### References

- Leve, M., Rubin, L., & Pusic, A. (2012). Cosmetic surgery and neoliberalisms: Managing risk and responsibility. *Feminism & Psychology*, 22(1), 122-141. <https://doi.org/10.1177/0959353511424361>
- Motta, V., & Larkin, M. (2023). Absence of other and disruption of self: An interpretative phenomenological analysis of the meaning of loneliness in the context of life in a religious community. *Phenomenology and the Cognitive Sciences*, 22(1), 55-80. <https://doi.org/10.1007/s11097-022-09832-8>
- Patil, S. B., Kale, S. M., Khare, N., Jaiswal, S., & Ingole, S. (2011). Aesthetic surgery: Expanding horizons: Concepts, desires, and fears of rural women in Central India. *Aesthetic Plastic Surgery*, 35(5), 717-723. <https://doi.org/10.1007/s00266-011-9675-2>
- Smith, J. A., Flowers, P., & Larkin, M. (2009). *Interpretive phenomenological analysis: Theory, method, and research*. London: Sage.

# Is High Statistics Anxiety as Pervasive in University Student Populations as We Think?

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## A meta-analysis of 181 samples across 43 countries examines the levels of statistics anxiety experienced by students

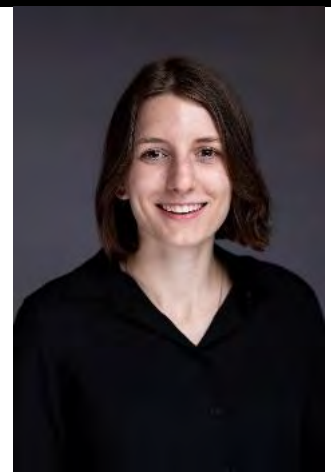
Statistics is a foundational requirement for students across numerous disciplines, equipping them with essential skills to conduct research, analyze data, and critically interpret information in an increasingly data-driven society. Students in the social sciences, particularly in psychology, are often assumed to experience anxiety towards statistics, with a significant body of literature identifying negative traits associated with statistics anxiety. For example, lower academic achievement (Paechter et al., 2017), procrastination (Onwuegbuzie, 2004), and academic dishonesty (Eshet et al., 2021) have all been linked to statistics anxiety. Consequently, many researchers have examined strategies and interventions to reduce statistics anxiety (e.g., Yang et al., 2021; Riach et al., 2025; Valle et al., 2021; Smith & Capuzzi, 2019).

Although it is clear that statistics anxiety can be an issue for students, few studies have appropriately quantified its prevalence. Existing studies tend to use unique operationalizations of statistics anxiety and rely on small samples from varying disciplines, which has resulted in a wide range of prevalence estimates, from ~54% (Alizamar et al., 2019) up to 92.3% (Tutkun, 2019) of students. The most commonly referenced rate is that up to 80% of students experience statistics anxiety, generally cited as Onwuegbuzie and Wilson (2003), which itself references an in-press article by the same primary author as the original source. However, this in-press article, titled *Prevalence of Statistics Anxiety Among Graduate Students*, appears to have never been published. Nothing is known about how statistics anxiety was measured or the sample(s) from which this rate was drawn, only that they are graduate students (a frequently omitted characteristic in citing papers). Despite this estimate being unreliable, of 67 peer reviewed articles assessing statistics anxiety published since 2003 identified within the present study, 30 explicitly cited it. It is therefore clear that more research is needed to quantify the degree of statistics anxiety experienced by students.

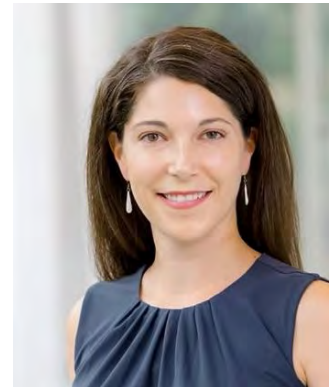
We aim to estimate the amount of statistics anxiety experienced by students using a meta-analytic approach in this study. Specifically, average responses on the most common measure of statistics anxiety, the Statistics Anxiety Rating Scale (STARS, Cruise et al., 1985), are examined. We hope the results can guide statistics educators to re-evaluate their treatment and discussion of statistics anxiety in their classroom, and to inform future research on statistics anxiety.

## Methods

The STARS contains 51 items asking participants about their anxiety and attitudes towards statistics, with responses measured on a 5-point Likert scale.



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Three subscales (26 items) intend to measure students' statistics anxiety: a) test and class anxiety, b) interpretation anxiety, and c) fear of asking for help. A response of 1 typically indicates no anxiety and a response of 5 indicates substantial or high anxiety. The overall mean response on each subscale, and associated heterogeneity should provide insight into the extent to which students experience statistics anxiety, on average, and how stable this estimate is.

The search process for studies to be included in the final analysis was comprehensive, including peer reviewed and non-peer reviewed sources (open access datasets, preprints, dissertations). To be eligible for inclusion, studies had to provide a sample size, mean, and standard deviation for at least one subscale of the STARS, and be available in English. Data sources were identified first by searching for the term "Statistics Anxiety Rating Scale" in ERIC, SCOPUS, APA PsycArticles, ProQuest Dissertations & Theses, and Open Science Framework. This search term was then used again to identify more articles in the *Statistics Education Research Journal*, and the *Journal for Statistics and Data Science Education*. Finally, reference lists of recent articles and systematic reviews (e.g., Nesbit & Bourne, 2018) were searched. The total number of data sources identified as eligible for inclusion was 83, with most (86.7%) being peer reviewed articles. Data from approximately 29,000 unique participants for each subscale are represented in these data sources.

Although data came from 83 data sources, more independent samples were available for analysis. Several articles published only descriptive statistics grouped by sex, age, or course, producing more samples than data sources. If data from multiple time points were available, only the first time point was analyzed to ensure that no participants or samples had a disproportionate influence on the results. Overall, data from 181 independent samples were analysed across the subscales. A single study (SMARVUS; Terry et al., 2023) provided data from 80 usable sub-studies from around the world.

In total, 181 samples from 43 countries spanning every continent reported information for at least one anxiety subscale. Although the sample was generally diverse, 44.8% of samples were collected in England or the USA. Participants were primarily young adults (average of sample means for age:  $M = 25.14$  years), female (average of sample percentages:  $M = 75.9\%$ ), undergraduate students (82.4% of samples), and enrolled in psychology programs (67.8% of samples reporting a specified major, 45.6% of all samples).

## Results

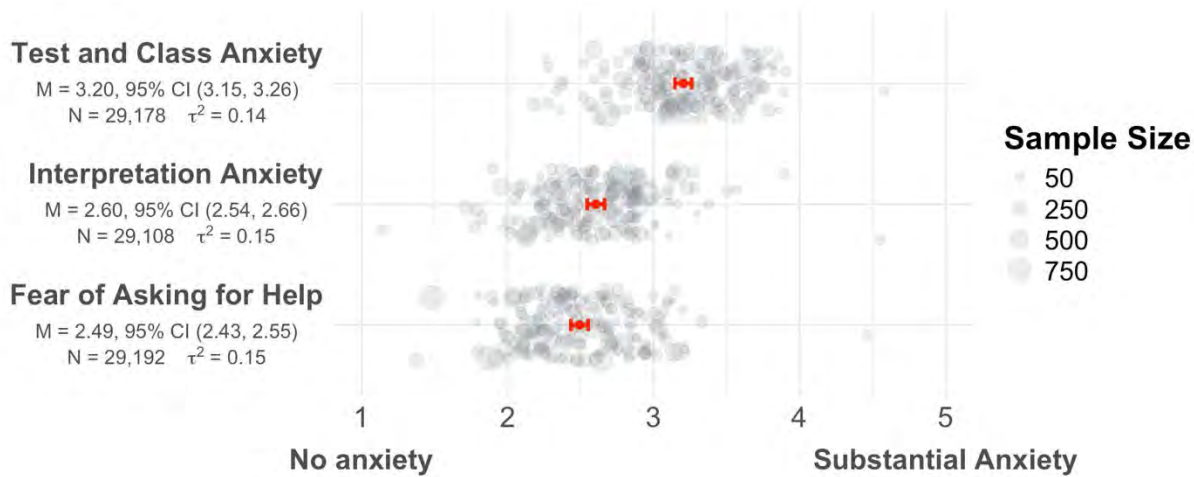
All analyses were conducted in R 4.3.3 (R Core Team, 2024). We applied random-effects models using the metafor package (Viechtbauer, 2010) to estimate the aggregate means for each STARS subscale. The overall estimate of each subscale mean, associated 95% confidence interval, and heterogeneity estimates are presented in Figure 1. Mean estimates and confidence intervals are between 2 and 3 for the Interpretation Anxiety and Fear of Asking for Help subscales, indicating mild to moderate anxiety in these domains. The estimate for Test and Class Anxiety is slightly above 3, indicating moderate anxiety. As indicated by the reported tau-squared estimates and the wide distribution of sample means, heterogeneity was moderate within subscales.

## Discussion

These results contrast with the pervasive narrative that statistics anxiety is overwhelmingly present and debilitating for students. In fact, this meta-analysis suggests that most students experience mild to moderate statistics anxiety as measured by the STARS. Consequently, most students are not experiencing statistics anxiety harmful for course success. In fact, the Yerkes-Dodson law suggests that mild to moderate anxiety levels facilitate course performance – a finding supported by Keeley et al. (2008). Overall, these results indicate that while some students may be highly anxious towards statistics, it appears misguided to approach teaching statistics courses with the assumption that most students are highly anxious. A more effective approach could be to let students share their experience and provide targeted support to those who need it.

**Figure 1**

*Distribution of Sample Means by Subscale with Associated Summary Statistics*



**Note.** Each point represents the subscale mean reported within a single independent sample. The estimated aggregate mean and 95% confidence interval are indicated in red.

Another interpretation of these results is that we are facing a measurement problem. Statistics anxiety is frequently assessed at the beginning of statistics courses, when students may have little prior exposure and thus lack the experience needed to accurately judge their anxiety. Additionally, we are unconvinced that the Fear of Asking for Help and Test and Class Anxiety subscales are tapping into the statistics anxiety that is actually experienced by students. Neither of these constructs are specific to the statistics classroom or align with the experiences shared with us by students. Instead, in our experience, anxiety in the statistics classroom is more closely tied to students' self-assessed low statistical competence, fear of failure, and an unclear understanding of what statistics courses entail.

Despite a breadth of research on statistics anxiety existing, these results highlight several foundational questions that remain unresolved, including how to define it, when and how to measure it, and what proportion of students are meaningfully hindered by it.

## References

- Alizamar, A., Afdal, A., Ildil, I., Ardi, Z., Ilyas, A., Zikra, Z., Daharnis, D., Firman, F., Nirwana, H., Mudjiran, M., Azhar, Z., Sukmawati, I., Sukma, D., Nurfarhanah, N., Hariko, R., Syahniar, S., Fikri, M., Trizeta, L., Saputra, Y., ... Febriani, R. D. (2019). Are there statistical anxiety differences between male and female students? *Journal of Physics: Conference Series*, 1157, 042127. <https://doi.org/10.1088/1742-6596/1157/4/042127>
- Cruise, R. J., Cash, R. W., & Bolton, D. L. (1985). Development and validation of an instrument to measure statistical anxiety. In *American Statistical Association Proceedings of the Section on Statistical Education* 4(3), 92-97).
- Eshet, Y., Steinberger, P., & Grinautsky, K. (2021). Relationship between Statistics Anxiety and Academic Dishonesty: A Comparison between Learning Environments in Social Sciences. *Sustainability*, 13(3), 1564. <https://doi.org/10.3390/su13031564>

- Keeley, J., Zayac, R., & Correia, C. (2008). Curvilinear Relationships Between Statistics Anxiety and Performance Among Undergraduate Students" Evidence For Optimal Anxiety. *Statistics Education Research Journal*, 7(1), 4-15. <https://doi.org/10.52041/serj.v7i1.477>
- Nesbit, R. J., & Bourne, V. J. (2018). Statistics Anxiety Rating Scale (STARS) Use in Psychology Students: A Review and Analysis with an Undergraduate Sample. *Psychology Teaching Review*, 24(2), 101-110.
- Onwuegbuzie, A. J., & Wilson, V. A. (2003). Statistics Anxiety: Nature, etiology, antecedents, effects, and treatments--a comprehensive review of the literature. *Teaching in Higher Education*, 8(2), 195-209. <https://doi.org/10.1080/1356251032000052447>
- Onwuegbuzie, A. J. (2004). Academic procrastination and statistics anxiety. *Assessment & Evaluation in Higher Education*, 29(1), 3-19. <https://doi.org/10.1080/0260293042000160384>
- Paechter, M., Macher, D., Martskvishvili, K., Wimmer, S., & Papousek, I. (2017). Mathematics Anxiety and Statistics Anxiety. Shared but Also Unshared Components and Antagonistic Contributions to Performance in Statistics. *Frontiers in Psychology*, 8, 1196. <https://doi.org/10.3389/fpsyg.2017.01196>
- R Core Team (2024). R: A Language and Environment for Statistical Computing. *R Foundation for Statistical Computing*, Vienna, Austria. <https://www.R-project.org/>.
- Riach, A. C., Shaker, A. J., Marshall, E., Binkowski, K. P., & Kay, W. P. (2025). A comparison of strategies used by lecturers to improve students' perceived feelings toward statistics--A study that is Stat-tastic! *Teaching Statistics*, test.12408. <https://doi.org/10.1111/test.12408>
- Smith, T. F., & Capuzzi, G. (2019). Using a Mindset Intervention to Reduce Anxiety in the Statistics Classroom. *Psychology Learning & Teaching*, 18(3), 326-336. <https://doi.org/10.1177/1475725719836641>
- Terry, J., Ross, R. M., Nagy, T., Salgado, M., Garrido-Vásquez, P., Sarfo, J. O., Cooper, S., Buttner, A. C., Lima, T. J. S., Öztürk, İ., Akay, N., Santos, F. H., Artemenko, C., Copping, L. T., Elsherif, M. M., Milovanović, I., Cribbie, R. A., Drushlyak, M. G., Swainston, K., ... Field, A. P. (2023). Data from an International Multi-Centre Study of Statistics and Mathematics Anxieties and Related Variables in University Students (the SMARVUS Dataset). *Journal of Open Psychology Data*, 11(1), 8. <https://doi.org/10.5334/jopd.80>
- Tutkun, T. (2019). Statistics Anxiety of Graduate Students. *International Journal of Progressive Education*, 15(5), 32-41. <https://doi.org/10.29329/ijpe.2019.212.3>
- Valle, N., Antonenko, P., Valle, D., Sommer, M., Huggins-Manley, A. C., Dawson, K., Kim, D., & Baiser, B. (2021). Predict or describe? How learning analytics dashboard design influences motivation and statistics anxiety in an online statistics course. *Educational Technology Research and Development*, 69(3), 1405-1431. <https://doi.org/10.1007/s11423-021-09998-z>
- Viechtbauer, W. (2010). Conducting Meta-Analyses in R with the metafor Package. *Journal of Statistical Software*, 36(3). <https://doi.org/10.18637/jss.v036.i03>
- Yang, S., Hazlehurst, J., & Taniguchi, D. A. A. (2021). Cats Teach Stats. *The American Biology Teacher*, 83(8), 542-544. <https://doi.org/10.1525/abt.2021.83.8.542>

# PsAlchology: Exploring the Frontier of Artificial Psychology

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**Introduces a field of inquiry at the intersection of artificial intelligence and psychological science**

## Introduction

What does it mean to feel, to sense, to reason? For millennia, we've considered the depth and nuance of these experiences to be uniquely human. We now stand at a new frontier—one where that assumption is being profoundly and creatively challenged. This frontier is Artificial Psychology (AP; Picard, 1997; Russell & Norvig, 2021), a theoretical and practical transformative advancement at the intersection of artificial intelligence and psychological science (Farahani et al., 2023).

It dares to move beyond traditional analysis to envision intelligent systems capable of considering complex mind data. To do this, the field unfolds across two beautiful, complementary dimensions: Approximate Psychology and Intricate Psychology (Farahani et al., 2023; 2024; Farahani, Watson, & Bazden, 2025; Kosko, 1997).

First, Approximate Psychology looks at our human side and acknowledges the inherent fluidity of our thought and emotion. Think about it—our feelings aren't simple on/off switches. Our perceptions and feelings fluctuate with context and uncertainty. Our best decisions often arise from a gut feeling—an intuition—rather than a strict calculation. This "fuzziness," our remarkable tolerance for ambiguity and paradox, is something conventional computational models have always struggled with. By combining fuzzy set theory (Zadeh, 1965), probabilistic reasoning (Pearl, 2009), and adaptive machine learning, approximate psychology allows an AI to represent mental states with graceful uncertainty (Farahani et al., 2025; Kovač et al., 2024). This approach softens mechanical rigidity, evolving our understanding of psychology from fixed equations toward dynamic, living patterns.

Second, Intricate Psychology takes on the role of the architect, constructing the deep architecture of the mind. It computationally replicates the internal choreography of perception, memory, language, reasoning, and emotion that defines how we think (Farahani, Watson, & Bazden, 2025; Friston et al., 2017).

This is precisely why Artificial Psychology is so necessary. As a highly multidisciplinary field, it tries to solve the problems that occur when psychologists need robust analytic frameworks. Both classical statistics and machine learning



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represent complementary approaches to the extraction of knowledge from data (Kovač et al., 2024; Shalev Shwartz & Ben David, 2014).

Yet both paradigms share a fundamental epistemic limitation: they operate only on observable data. Unobserved variables, latent structures, and hidden dynamics remain outside their reach (Pearl & Mackenzie, 2018). Consequently, both systems model a projection of reality, not reality itself. This is where promoting and improving artificial intelligence helps us find a holistic model of mental models (Farahani, Kovač, Fardi, & Watson, 2025; Friston, 2022).

**“Overlaps, evolution, and blurring are the norm.”** By fusing theoretical fuzzy inference, deep learning algorithms, and probabilistic models, we can finally offer authentic, flexible models capable of sophisticated prediction—and more importantly—of engaging real world psychological complexity (Farahani et al., 2023; Kovač et al., 2025; Russell & Norvig, 2021).

This evolution is not merely methodological but epistemological (Farahani et al., 2025; Friston et al., 2017). It redefines what it means to know a mind—shifting from static measurement to dynamic, ongoing understanding. We already see applications such as adaptive learning systems that respond to a student’s mood and socially assistive robots that modulate affective tone (Cowie & Cornelius, 2022; Farahani et al., 2023; Picard, 1997).

Human psychology is not impersonal; it reflects diverse cultural contexts and arises from deeply personal data. Artificial psychology, therefore, must remain both scientifically rigorous and ethically vigilant (Farahani et al., 2023; Floridi & Cowls, 2021). Its progress depends on sustained dialogue among engineers, clinicians, philosophers, and artists—a dialogue ensuring simulation of thought while honoring personhood.

Recognizing this shift, our university has established a Master of Science (M.S.) in Artificial Psychology to train experts fluent in both psychological science and computational intellect (Farahani et al., 2023). Despite its later renaming to “Psychology and Artificial Intelligence,” the foundational vision continues to shape its theoretical core.

### Conclusion

Ultimately, artificial psychology holds a mirror to humanity—it invites us into renewed inquiry about what it means to think, feel, and empathize (Farahani et al., 2023; Friston et al., 2017; Picard, 1997). The creation of artificial minds may indeed be one of humanity’s most revealing self experiments.

### References

- Cowie, R., & Cornelius, R. R. (2022). Affective computing: Past, present and future. *Emotion Review*, 14(1), 3-15. <https://doi.org/10.1177/1754073921994425>
- Floridi, L., & Cowls, J. (2021). *A unified framework of five principles for AI in society*. *Harvard Data Science Review*, 3(1). <https://doi.org/10.1162/99608f92.fcd550d1>



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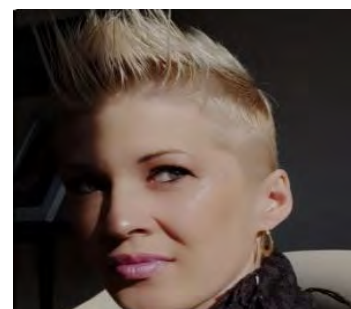


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- Friston, K. (2022). *Computational psychiatry and the free-energy principle*. *Biological Psychiatry*, 91(5), e33–e35. <https://doi.org/10.1016/j.biopsych.2021.12.001>
- Friston, K., Zeidman, P., & Litvak, V. (2017). A free-energy principle for modeling mind and brain. *Neuroscience and Biobehavioral Reviews*, 77, 221–245. <https://doi.org/10.1016/j.neubiorev.2017.03.026>
- Kosko, B. (1997). *Fuzzy engineering*. Prentice Hall.
- Pearl, J. (2009). *Causality: Models, reasoning and inference* (2nd ed.). Cambridge, UK: Cambridge University Press.
- Pearl, J., & Mackenzie, D. (2018). *The book of why: The new science of cause and effect*. New York, NY: Basic Books.
- Picard, R. W. (1997). *Affective computing*. Cambridge, MA: MIT Press.
- Russell, S. J., & Norvig, P. (2021). *Artificial intelligence: A modern approach* (4<sup>th</sup> ed.). London, UK: Pearson.
- Shalev-Shwartz, S., & Ben-David, S. (2014). *Understanding machine learning: From theory to algorithms*. Cambridge, UK: Cambridge University Press.
- Zadeh, L. A. (1965). Fuzzy sets. *Information and Control*, 8(3), 338–353. [https://doi.org/10.1016/S0019-9958\(65\)90241-X](https://doi.org/10.1016/S0019-9958(65)90241-X)

### Supplementary Reading

- Farahani, H., Blagojević, M., Azadfallah, P., Watson, P., Esrafilian, F., & Saljoughi, S. (2023). *An introduction to artificial psychology*. Cham, Switzerland: Springer. <https://doi.org/10.1007/978-3-031-31172-7>
- Farahani, H., Watson, P., & Bazden, T. (2025). *Introduction to intricate artificial psychology with Python*. Amsterdam, Netherlands: Elsevier Academic Press.
- Farahani, H., Kovač, N., Fardi, H., & Watson, P. C. (2025). Modelling pain perception using fuzzy cognitive maps. *Journal of Pain Research*, 18, 5153–5174. <https://doi.org/10.2147/JPR.S525200>
- Farahani, H. ...Allahyari, A. (2024). Explainable multilayer perceptron classification model for detecting the internalized shame-based on childhood trauma, social-emotional competence, cognitive flexibility, distress tolerance, alexithymia, and age. In: E. Vanderheiden & C.-H. Mayer, (Eds.), *Shame and ageing in a transforming world*. Cham, Switzerland: Springer. [https://doi.org/10.1007/978-3-031-54585-6\\_2](https://doi.org/10.1007/978-3-031-54585-6_2)
- Kovač, N., Ratković, K., Watson, P., & Farahani, H. (2024). A practical applications guide to machine learning regression models in psychology with Python. *Methods in Psychology*, 11. <https://doi.org/10.1016/j.metip.2024.100156>



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Kovač, N., Ratković, K., Farahani, H., & Watson, P. (2025). Machine learning regression models for internal shame. *Acta Psychologica*, 260, 105721. <https://doi.org/10.1016/j.actpsy.2025.105721>

## Publication Corner



Vois, D., Damian-Ilea, L., & Negru-Subtirica, O. (2025). Is there too much school engagement? A longitudinal study on the bidirectional relations between school engagement and perfectionistic self-presentation in adolescents. *Educational Psychology*, 45(10), 1134-1154. <https://doi.org/10.1080/01443410.2025.2551150>

Over the past decade there has been an increase in studies of adolescents' school engagement. However, fewer studies have focused on the relation between school engagement and adolescents' perfectionistic characteristics. The present four-wave longitudinal study investigates the bidirectional relations between school engagement and perfectionistic self-presentation (as a personality characteristic) in a sample of 744 adolescents ( $M_{\text{age}} = 15.2$  years,  $SD = 1.9$ ; 11-19 years). Cross-lagged analyses showed that behavioural engagement predicted relative decreases in adolescents' use of perfectionistic self-promotion and nondisclosure of imperfection strategies. In contrast, cognitive engagement predicted relative increases in adolescents' use of perfectionistic self-promotion, nondisplay of imperfection, and nondisclosure of imperfection strategies.

McNally, S., Keenan, L., Lynam, A. M., O'Keeffe, C., & Sweeney, M. R. (2025). 'I don't mind if you ask me': Methodological insights from conducting inclusive interviews with autistic students about their school experiences. *International Journal of Qualitative Methods*, 24. <https://doi.org/10.1177/16094069251397808>

In this study, we reflect on our experiences of planning for and implementing a large qualitative study of the lived experiences of autistic children and adolescents, a historically marginalised population. While there is a growing recognition of the need to amplify the voices of under-served populations, inclusive and participatory research is still rare, and even rarer with autistic children. Working within a neurodiversity paradigm, and drawing upon our qualitative study exploring the school experiences of autistic students aged 5 to 19 years ( $N = 51$ ) in Ireland, we offer a real-world example of a flexible, person-centred research protocol involving photovoice and adapted interviews. We describe how we individualised our protocol for the autistic students who participated in this study, supporting a wide range of ages and communication profiles. Reflecting on the successes and challenges of this approach from an ethical and methodological standpoint, we highlight the importance of sensitivity, flexibility, and the value of small actions. Finally, we argue that embracing inclusivity for fully participatory research with younger children is necessary and achievable, and is needed in the wider culture of academic research.

Elosua, P., & Wechsler, S. M. (2025). Attitudes toward testing in Latin America: Current situation and challenges. *International Journal of Testing*, 25(3-4), 237-254. <https://doi.org/10.1080/15305058.2025.2552757>

Psychological testing is an important component of professional practice, but its use in Latin America remains insufficiently documented. To address this, we surveyed 2,319 psychologists from nine countries using a modified European Federation of Psychologists' Associations (EFPA) questionnaire. The study examined perceptions of test misuse and training, professional attitudes toward testing, and the need for regulatory frameworks. Measurement invariance was assessed, and age and gender effects were analyzed with linear mixed-effects models. Results indicate generally positive attitudes toward testing, together with persistent shortcomings in psychometric training and regulation. Age was associated with differences in attitudes and perceived need for regulation, whereas gender showed no significant effects. The findings underscore the importance of strengthening training and regulatory systems and fostering collaboration among national and international institutions to advance standardized testing practices across Latin America.

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