INTEGRATING SOCIAL ROBOTICS AND ARTIFICIAL INTELLIGENCE IN PSYCHOLOGICAL WORK – EXPECTATIONS AND FUTURE DIRECTIONS

Mayiana Mitevska*, Paulina Tsvetkova

"Paisii Hilendarski" University, Plovdiv, 4027, Bulgaria

Abstract

The present work explores the perceptions and potential applications of social robotics and artificial intelligence (AI) within the field of psychological work. The study collected data via a survey exploring expectations and future directions, with participants comprising undergraduate students in Psychology and Pedagogy from one of Bulgaria's leading universities. The findings suggest that AI is expected to play an increasingly influential role in psychological services, with social robots likely to assist in areas such as diagnostics and therapy. Nevertheless, maintaining the human element and emotional connection remains a significant challenge. The results indicate that AI will become integrated into the field of psychology, with social robots becoming common tools in psychological practice. Universities will have to adjust their curricula to equip future professionals with the competencies needed to collaborate with AI and robotic technologies. Ultimately, the study emphasizes the importance of adopting a balanced approach that leverages the benefits of AI and automation while safeguarding emotional intelligence and human interaction in professional settings.

Keywords: *social robotics, artificial intelligence, psychological work, expectations, directions*

1. INTRODUCTION

In recent decades, the development of artificial intelligence (AI) and social robotics has gained increasing importance across various domains of human life, including psychological practice. The transition from traditional to digitally assisted psychological interventions opens new horizons for diagnostics, therapy and mental health support. Technological advancements enable the creation of intelligent systems and social robots with the potential to support the work of psychologists and therapists—especially in contexts of staff shortages, remote areas, or when long-term care is needed. The development of AI and social robots is becoming increasingly present in the humanities and social sciences. In psychology, intelligent systems are being created to recognize emotions, screen for depression or anxiety, and even assist therapeutic processes through mobile applications and voice assistants (Torous et al., 2020). This creates a need for systematic research on their potential and limitations in the context of real-world practice. The COVID-19 pandemic brought to the forefront the issue of a shortage of mental health professionals, particularly in remote areas and among vulnerable populations. AI and social robots offer alternative and complementary solutions for providing care and therapeutic support where human resources are limited. This makes the topic both socially relevant and practically significant (Broadbent et al., 2018). With the expanding role of AI and robotics in psychological work, numerous issues arise regarding ethics, privacy, and the boundaries of human contact. The lack of established standards and regulations raises the question: How can we use these technologies responsibly without compromising the principles of psychological ethics? (Sharkey, 2016). This dilemma renders the study not only scientifically necessary but also morally urgent. Future psychologists will work in a world where technology is an inseparable part of the professional environment. Understanding the possibilities and risks associated with AI and social robotics is essential for developing competent and adaptive professionals in today's rapidly evolving world. The study aims to examine the perceptions of undergraduate students regarding the use of AI and social robotics in psychological work. The current paper fosters critical thinking and encourages an informed approach to future innovations in psychology through the integration of AI and social robotics.

2. RELATED WORKS

Social robots and AI can be used as tools for psychological support and coaching. One study explored the use of a social robot coach to deliver positive psychology interventions to students living in dormitories. A total of 35 students participated in the study, with the robot conducting daily sessions on positive psychology, as well as providing additional services such as weather forecasts and reminders. The results showed statistically significant improvements in psychological well-being, mood and participants' willingness to undertake behavioral changes to improve their well-being. Furthermore, a significant correlation was found between the effectiveness of the intervention and the students' personality traits (Jeong, S. et al., 2020).

Another innovative development is the social robot "Ryan," which administers internet-based cognitive-behavioral therapy (iCBT) to elderly individuals with depressive symptoms (Dino, F., et al., 2021). In the study, the robot Ryan conducted seven iCBT sessions using an AI-based dialogue system. The results indicated improvements in participants' mood and engagement, supporting the notion that social robots can be effective in therapeutic contexts.

In addition, social robots are already being used to conduct mindfulness practices, including relaxation sessions, meditation, and stress management. In one study, a teletherapy framework was developed that enables a human coach to conduct mindfulness training via the robot Pepper (https://www.softbank.jp/en/robot/), with the coach's upper body and head movements replicated in real-time. The human coach uses a virtual reality headset (HMD) to see from the robot's perspective and communicates with participants through two-way audio. Over five weeks, researchers compared participants' interactions with the robot coach and a live human coach. The results showed that sessions with the human coach consistently received high ratings (over 4 out of 5), while ratings for the robot coach improved over time, especially regarding movement and conversation. Both training methods elicited positive responses from participants, but the human coach was rated significantly higher in terms of perceived liveliness, likability, and intelligence (Bodala, I. P., Nikhil C., & Hatice G., 2021).

One of the most promising approaches is the use of social robots to simulate clinical environments and "virtual patients," through which future psychologists can practice psychological interviews and interventions. An example of such an application is the robot developed by Furhat Robotics (https://www.furhatrobotics.com/). A study by a team at Linköping University (Sweden) presents a prototype of a simulated environment for psychotherapy training, where Furhat plays the role of a virtual patient. The aim is to create a safe and realistic setting in which therapists can practice techniques such as ISTDP (Intensive Short-Term Dynamic Psychotherapy) (Johansson, R., Thellman, S., Skantze, G., 2017). This research provides preliminary indications that clinical psychologists show strong interest in using the Furhat robot as a training tool. Moreover, measurements from the GODSPEED scale—perceived animacy and likability—appear to have predictive value, explaining over half of the variance in psychologists' interest. These results suggest that a psychotherapy training environment using a social robot is feasible. It can be argued that two of Furhat's strengths are its highly realistic facial expressions and perceived "friendliness." Therefore, the study results indicate that the Furhat robot is indeed a suitable choice for this type of training environment.

Another application of the Furhat social robot is a psychotherapy training environment with virtual patients (Johansson, R., Skantze, G., Jönsson, A., 2017). The system delivers a training program consisting of various modules, starting with the development of basic psychotherapy skills and progressing to tasks where these skills must be applied in an integrated manner. This type of training heavily relies on observing and responding to both verbal and non-verbal patient behavior during sessions. For this reason, the Furhat robot is considered an ideal platform for such purposes. The article describes the system's underlying concept and its technical implementation.

Social robots have been successfully used as facilitators in therapeutic sessions, especially with children with specific needs such as autism. In this publication (Palestra, G., et al., 2021), the authors present an extensive review of the use of the NAO robot in therapeutic interventions for children with autism. Various programs are described, including ROB'AUTISME and NAOTIsmIA, which use NAO to stimulate communication skills, imitation, and social interaction. The main conclusions of the report

indicate that NAO supports communication and social interaction among children with autism by serving as a non-judgmental, predictable, and engaging mediator. Furthermore, within programs such as ROB'AUTISME and NAOTIsmIA, NAO is used to develop skills such as imitation, eye contact, emotion recognition, and motor coordination. Children perceive the robot as a friend or team member, which facilitates the therapeutic process and increases motivation to participate. Therapists and educators report that NAO helps build trust and creates a structured and safe environment for practicing social skills. The report highlights NAO's potential to be integrated into multidisciplinary interventions that combine technology with behavioral therapies.

In another study, the authors examine the use of Kaspar with individuals with special needs, gathering feedback from 54 professionals (therapists, educators, and psychologists) working with children with autism (Huijnen, C. et al., 2016). The main findings show that Kaspar is perceived as a valuable tool for supporting communication, social interaction, play, and emotional well-being. The robot is considered particularly suitable for individualized interventions, especially for children who struggle in traditional social situations. The study also presents the top 10 goals that Kaspar can support in therapeutic and educational contexts.

Interpersonal communication behaviors, such as self-disclosure and social sharing, can support emotional well-being by providing and receiving support, improving mood, creating an environment for expressing emotions, and regulating feelings (Zaki & Williams, 2013). In a long-term experiment, 39 participants from the general population in the United Kingdom engaged in conversations with the social robot Pepper (https://www.softbank.jp/en/robot/) twice a week for five weeks (a total of 10 sessions), sharing everyday experiences with the robot. The researchers found that as the sessions progressed, participants disclosed more to the robot (in terms of both the duration of disclosure in seconds and the number of words used) and increasingly perceived the robot as socially competent and comforting. Repeated interactions also led to improved mood (both after each session and over time) and a reduction in feelings of loneliness (Laban, Kappas, et al., 2022, 2023).

3. MATERIALS AND METHODS

3.1. Materials

The current study investigates perceptions and attitudes regarding the integration of social robotics and AI into psychological practice, with particular emphasis on their influence on the changing professional role of psychologists, due to technological advancements. The study utilized a custom-designed survey featuring 10 statements. These statements addressed different aspects of AI and robotics integration within psychology—including politics, society, industry, education, and practitioners—with two items dedicated to each category. The study focused on evaluating the mid-term effects of AI and robotic technologies, setting 2030 as the target year.

3.2. Methods

The survey was conducted online in April and May 2025 via Google Forms. The respondents were 53 undergraduate students pursuing their Bachelor's degrees in Psychology and Pedagogy at a major university in Bulgaria. They rated the likelihood of each statement on a 5-point Likert scale, from 1 (not likely at all) to 5 (highly likely). To ensure content validity, the survey was developed through an extensive literature review and expert input. Participation was anonymous, collecting only basic demographic data such as field of study, gender, age and self-assessed knowledge of AI. While the sample size and composition may limit the generalizability of the findings, the results provide meaningful insights about the use of social robotics and AI in psychological practice.

4. RESULTS

Given that this paper centers on AI and social robotics, the respondents' familiarity with AI was evaluated. Although all participants are Psychology and Pedagogy students, almost half of them (48.2%) reported having an intermediate understanding of AI. 37.5% of the respondents identified as beginners,

while 14.3% considered themselves advanced in these technologies. The distribution of these results is illustrated in the pie chart below.

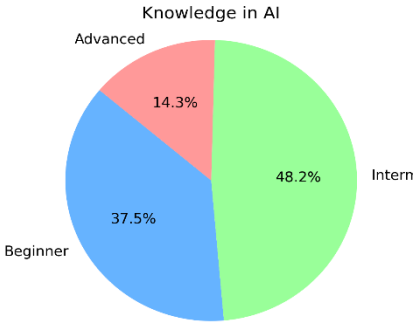

Fig. 1. Knowledge in AI

Source: Authors' contribution

In terms of demographics, the majority of students (91.1%) are between 18 and 24 years old. Additionally, 3.6% of the participants are in the 25-34 age group and the same percentage of people fall in the 35-44 age group. 1.8% are in the 45-54 age group. Regarding gender, the sample includes 21% males and 79% females. These results are illustrated in Figures 2 and 3.

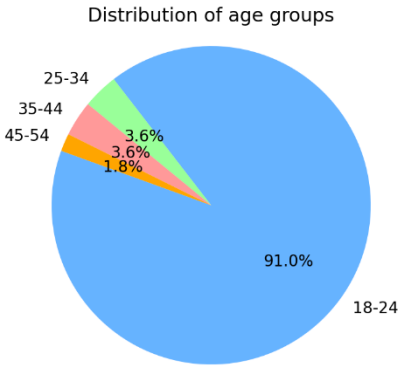

Fig. 2. Age of students

Source: Authors' Contribution

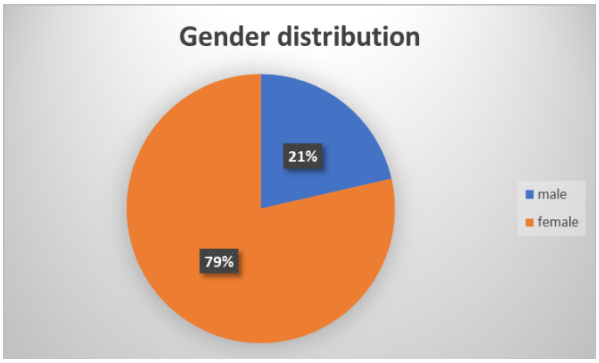

Fig. 3. Gender distribution of students

Source: Authors' Contribution

To examine our research objective, we analyzed the distribution of responses on the 5-point Likert scale. The table 1 below shows the distribution of responses across all ten statements in the survey. The analysis was performed using Python programming language along with its statistical libraries, such as pandas and numpy. As shown by the data, the majority of respondents are neither optimistic nor pessimistic about incorporating social robotics and AI into psychological practice. The most common response was 3 – moderately likely. Some statements show increased optimism, particularly statement 3: 28.3% of the participants rated 4 (very likely) and 13.2% rated 5 (highly likely). Statement 8 also seems optimistic for the respondents: 30.2% rated 4, 17.0% rated 5 . Statement 3 is "By 2030, AI-based virtual therapists offering 24/7 support will be widely used to assist people with anxiety, depression and other mental health conditions" and statement 8 is "By 2030, AI-assisted tools for psychodiagnostic assessment (including tests and questionnaires) will be integrated into the practice of at least 50% of psychologists and clinical centers in the country". The respondents find the suggested scenarios more realistic and probable to happen by 2030. On the other hand, statement 9 shows significantly higher pessimism - 18.9% rated 1, 35.8% rated 2, which is 54% in total, regarding the negative end of the spectrum. The statement is "By 2030, mental health training involving the use of AI tools and/or robotic technologies will be mandatory for professionals in education, social services and healthcare". The respondents express greater doubts or concerns regarding this scenario, possibly perceiving it as less probable in a national context.

Statement	1 - not likely at all	2 - unlikely	3-moderately likely	4-very likely	5 - highly likely
Statement 1	3.8%	28.3%	41.5%	22.6%	3.8%
Statement 2	5.7%	35.8%	32.1%	18.9%	7.5%
Statement 3	15.1%	22.6%	20.8%	28.3%	13.2%
Statement 4	5.7%	17.0%	37.7%	22.6%	17.0%
Statement 5	17.0%	22.6%	37.7%	20.8%	1.9%
Statement 6	13.2%	32.1%	37.7%	15.1%	1.9%
Statement7	9.4%	32.1%	37.7%	17.0%	3.8%
Statement 8	3.8%	9.4%	39.6%	30.2%	17.0%
Statement 9	18.9%	35.8%	28.3%	13.2%	3.8%
Statement 10	5.7%	28.3%	30.2%	26.4%	9.4%

Table 1. Probability distribution by statement

Source: Authors' contribution

We also evaluated the degree of agreement among respondents to identify the extent to which their views aligned. The results were once again analyzed using Python libraries and are presented in Figure 4.

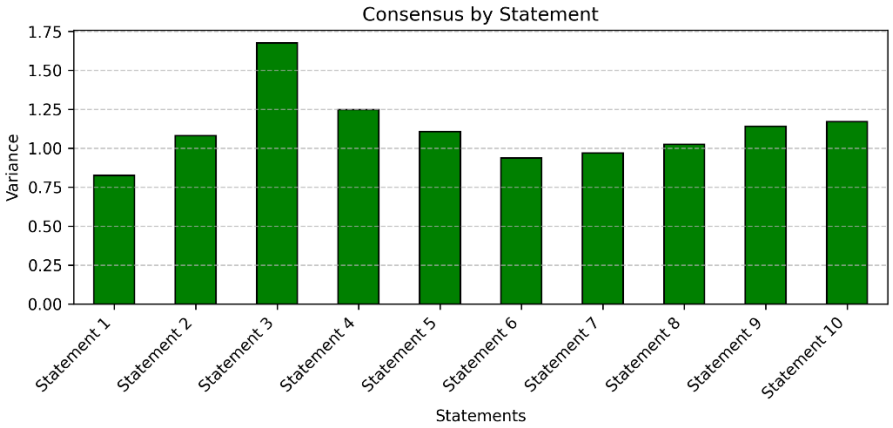

Fig. 4. Level of consensus across statements

Source: Authors' contribution

Statement 1 shows the lowest variance (around 0.76), indicating the highest level of agreement among all statements. Specifically, 41.5% of the students believe it is moderately likely that, by 2030, the European Union will implement a unified regulatory framework for the ethical application of AI in psychological assessment, therapy and mental health interventions. In contrast, statement 3 exhibits the highest variance (almost 1.75), reflecting the greatest level of disagreement among participants. This statement suggests that, by 2030, AI-powered virtual therapists providing 24/7 support will be widely available to assist individuals with anxiety, depression and other mental health issues. Responses to this statement are widely dispersed, with 15.1 %, considering it not likely at all, 22.6% considering it unlikely, 20.8% seeing it as moderately likely, and 28.3% viewing it as very likely and 13.2 % thinking it is highly likely. The responses highlight differing opinions regarding the prevalence of 24/7 virtual therapists. The remaining statements (2, 5, 6, 7, 8, 9, and 10) exhibit variances ranging from 0.9 to 1.2, indicating a moderate level of consensus among students.

5. DISCUSSION

The present study aimed to examine students' expectations and attitudes about the integration of social robotics and AI into psychological practice by 2030. Additionally, it evaluated the level of agreement among their perspectives. The survey results indicated that many respondents held a moderate position, with a slight tendency toward skepticism. While roughly one-third of participants expressed neutral views, a greater portion leaned toward pessimistic expectations rather than optimism. In terms of consensus, the variance analysis revealed that respondents generally demonstrated a moderate level of agreement across the ten statements. Overall, the participants' opinions were more consistent than divided. These findings underscore the nuanced nature of attitudes toward AI and robotics in psychology, indicating that although students acknowledge the increasing influence of technology, they tend to approach its future use with careful consideration rather than unquestioning acceptance. Further research could explore the underlying factors shaping these viewpoints and monitor how they change over time as technological progress continues to transform the field.

6. CONCLUSIONS

In summary, our study shows that the integration of AI and robotic technologies into psychological practice is met with cautious optimism. Although the future holds many uncertainties, one thing is clear:

technology is not here to replace human empathy but to enhance it in new and unforeseen ways. The true challenge for the coming decade lies not only in developing more advanced technologies but in cultivating professional practices that merge technological capabilities with genuine human understanding. The psychological field is on the brink of its next stage of development — a stage where human insight and artificial intelligence will collaborate to foster greater understanding and provide more effective support for individuals.

ACKNOWLEDGMENTS

This research was supported by DIGITAL SUSTAINABLE ECOSYSTEMS - TECHNOLOGICAL SOLUTIONS AND SOCIAL MODELS FOR ECOSYSTEM SUSTAINABILITY (DUECOS) BG-RRP-2.004-0001-C01, funded by National Recovery and Resilience Plan of the Republic of Bulgaria, component „Innovative Bulgaria“, investment 1 „Programme to Accelerate Economic Recovery and Transformation through Research and Innovation “ and pillar 2 „Establishing of a Network of Research Higher Education Institutions in Bulgaria “.

REFERENCES

1. Bodala, I. P., Nikhil Churamani, & Hatice Güneş. (2021). Teleoperated Robot Coaching for Mindfulness Training: A Longitudinal Study. Apollo (University of Cambridge). https://doi.org/10.1109/ro-man50785.2021.9515371
2. Broadbent, E., Garrett, J., Jepsen, N., Li Ogilvie, V., Ahn, H. S., Robinson, H., & MacDonald, B. (2018). Robots in elder care: Do they improve mental health? Journal of Gerontology, 73(5), 681–688. https://doi.org/10.1093/geronb/gbx033.
3. Dino, F., Zandie, R., Abdollahi, H., & Mahoor, M. H. (2021). Delivering Cognitive Behavioral Therapy Using a Conversational Social Robot. arXiv preprint arXiv:1909.06670 Cookson, AH 1985, *Particle trap for compressed gas insulated transmission systems*, US Patent 4554399.
4. Huijnen, C. A. G. J., Lexis, M. A. S., & de Witte, L. P. (2016). Matching Robot KASPAR to Autism Spectrum Disorder (ASD) Therapy and Educational Goals. International Journal of Social Robotics, 8(4), 445–455
5. Johansson, R., Skantze, G., Jönsson, A. (2017). A Psychotherapy Training Environment with Virtual Patients Implemented Using the Furhat Robot Platform. In: Beskow, J., Peters, C., Castellano, G., O'Sullivan, C., Leite, I., Kopp, S. (eds) Intelligent Virtual Agents. IVA 2017. Lecture Notes in Computer Science, vol 10498. Springer, Cham. https://doi.org/10.1007/978-3-319-67401-8_20
6. Johansson, R, Thellman, S., Skantze, G. (2017). Psychotherapists' interest in using the Furhat social robot for clinical training, PROCEEDINGS OF THE 13TH SWECOG CONFERENCE 2017, UPPSALA
7. Jeong, S., Alghowinem, S., Aymerich-Franch, L., Arias, K., Lapedriza, A., Picard, R., Park, H. W., & Breazeal, C. (2020). A Robotic Positive Psychology Coach to Improve College Students' Wellbeing. RO-MAN 2020).
8. Laban, G., Kappas, A., Morrison, V., & Cross, E. S. (2022b). User Experience of Human-Robot Long-Term Interactions. Proceedings of the 10th International Conference on Human-Agent Interaction, 287–289. https://doi.org/ 10.1145/3527188.3563927
9. Laban, G., Kappas, A., Morrison, V., & Cross, E. S. (2023). Opening Up to Social Robots: How Emotions Drive Self-Disclosure Behavior. 2023 32nd IEEE International Conference on Robot and Human Interactive Communication (ROMAN), 1697–1704. https://doi.org/10.1109/ROMAN57019.2023.10309551

10. Palestra, G., De Carolis, B., Sakka, S., Le Buhé, T., Al Najjar, F., Duris, O., Matu, S., & Bernex, P.-H. (2021). NAO, a humanoid robot as a therapeutic mediator for young people with autism. SoftBank Robotics & ERM
11. Sharkey, A. (2016). Robots and care: Replacing human presence? Ethics and Information Technology, 18(4), 283–295. https://doi.org/10.1007/s10676-016-9404-5
12. Torous, J., Onnela, J.-P., & Keshavan, M. (2020). New technologies in psychiatry: Measuring the mind via smartphones. World Psychiatry, 19(3), 307–308. https://doi.org/10.1002/wps.20744.
13. Zaki, J., & Williams, C. W. (2013). Interpersonal emotion regulation. Emotion, 13(5), 803–810. https://doi.org/10.1037/A0033839