







#### IV. DISCUSSION

With the known causes and cures of autism still nonexistent, working to lower costs without attenuating interventions should remain a purpose of action. Autism advocates should continue their efforts to improve social policy and educate families about their rights in terms of treatment options. Progress in children with autism is perceived to be affected by accuracy, consistency, reciprocity, and immediacy of the intervention [26]. In addition, more treatment time means more progress, and utilizing tools such as social robots may prove to be qualified to improve the capacity and efficacy of interventions all around. We look forward to beginning pilot clinical studies to demonstrate the feasibility and effectiveness of our robot-assisted approach to diagnosis, therapy, and charting.

#### REFERENCES

- [1] J. Baio, "Prevalence of autism spectrum disorder among children aged 8 years—autism and developmental disabilities monitoring network, 11 sites, united states, 2010.," *CDC Report*, vol. 63, p. 1, 2014.
- [2] M. L. Ganz, "The lifetime distribution of the incremental societal costs of autism," *Archives of Pediatrics & Adolescent Medicine*, vol. 161, no. 4, pp. 343–349, 2007.
- [3] APA, *Diagnostic and Statistical Manual of Mental Disorders V*. 2013.
- [4] B. P. Humphreys, "Infants and toddlers with autism spectrum disorders: Early identification and early intervention," *Journal of Early Intervention*, vol. 32, no. 75, pp. 75–98, 2010.
- [5] D. L. Sharpe and D. L. Baker, "Financial issues associated with having a child with autism," *Journal of Family and Economic Issues*, vol. 28, no. 2, pp. 247–264, 2007.
- [6] T. Zane, C. Davis, and M. Rosswurm, "The cost of fad treatments in autism.," *Journal of Early & Intensive Behavior Intervention*, vol. 5, no. 2, 2008.
- [7] G. S. Chasson, G. E. Harris, and W. J. Neely, "Cost comparison of early intensive behavioral intervention and special education for children with autism," *Journal of Child and Family Studies*, vol. 16, no. 3, pp. 401–413, 2007.
- [8] S. Baron-Cohen, "Theory of mind in normal development and autism," 2001.
- [9] S. L. Odom, B. A. Boyd, L. J. Hall, and K. Hume, "Evaluation of comprehensive treatment models for individuals with autism spectrum disorders," *Journal of autism and developmental disorders*, vol. 40, no. 4, pp. 425–436, 2010.
- [10] M. Dawson and M. A. Gernsbacher, "Effectiveness of intensive autism programmes," *The Lancet*, vol. 375, no. 9716, pp. 722–723, 2010.
- [11] S. J. Rogers and L. A. Vismara, "Evidence-based comprehensive treatments for early autism," *Journal of Clinical Child & Adolescent Psychology*, vol. 37, no. 1, pp. 8–38, 2008.
- [12] P. Mundy and M. Sigman, "Joint attention, social competence and developmental psychopathology," *Developmental psychopathology*, vol. 1, pp. 293–332, 2006.
- [13] K. Dautenhahn and I. Werry, "Towards interactive robots in autism therapy: Background, motivation and challenges," *Pragmatics & Cognition*, vol. 12, no. 1, pp. 1–35, 2004.
- [14] D. Feil-Seifer and M. J. Matarić, "Toward socially assistive robotics for augmenting interventions for children with autism spectrum disorders," in *Experimental robotics*, pp. 201–210, Springer, 2009.
- [15] T. Kanda, R. Sato, N. Saiwaki, and H. Ishiguro, "A two-month field trial in an elementary school for long-term human–robot interaction," *Robotics, IEEE Transactions on*, vol. 23, no. 5, pp. 962–971, 2007.
- [16] C. Breazeal and B. Scassellati, "A context-dependent attention system for a social robot," *rn*, vol. 255, p. 3, 1999.
- [17] B. Robins, P. Dickerson, P. Stribling, and K. Dautenhahn, "Robot-mediated joint attention in children with autism.," *Interaction studies*, vol. 5, no. 2, 2004.
- [18] H. Kozima, C. Nakagawa, and Y. Yasuda, "Interactive robots for communication-care: a case-study in autism therapy," in *IEEE Int Workshop Rob and Human Interactive Com*, pp. 341 – 6, 2005.
- [19] A. Billard, B. Robins, J. Nadel, and K. Dautenhahn, "Building robota, a mini-humanoid robot for the rehabilitation of children with autism," *Assistive Technology*, vol. 19, no. 1, pp. 37–49, 2007.
- [20] J. Wainer, K. Dautenhahn, B. Robins, and F. Amirabdollahian, "Collaborating with kaspar: Using an autonomous humanoid robot to foster cooperative dyadic play among children with autism," in *Humanoid Robots (Humanoids), 2010 10th IEEE-RAS International Conference on*, pp. 631–638, IEEE, 2010.
- [21] C. M. Corsello, "Early intervention in autism," *Infants & Young Children*, vol. 18, no. 2, pp. 74–85, 2005.
- [22] B. Scassellati, H. Admoni, and M. Mataric, "Robots for use in autism research," *Annual Review of Biomedical Engineering*, vol. 14, pp. 275–294, 2012.
- [23] L. Dickstein-Fischer, E. Alexander, X. Yan, H. Su, K. Harrington, and G. Fischer, "An affordable compact humanoid robot for autism spectrum disorder interventions in children," in *IEEE Engineering in Medicine and Biology Conference (EMBC)*, pp. 5319–5322, 2011.
- [24] "Evaluations, eligibility determinations, individualized education programs, and educational placements," *Individuals with Disabilities Education Act, Sec. 614*.
- [25] D. L. Hassert, A. N. Kelly, J. K. Pritchard, and J. D. Cautilli, "The licensing of behavior analysts: Protecting the profession and the public.," *Journal of Early & Intensive Behavior Intervention*, vol. 5, no. 2, 2008.
- [26] M. D. Symes, B. Remington, T. Brown, and R. P. Hastings, "Early intensive behavioral intervention for children with autism: Therapists perspectives on achieving procedural fidelity," *Research in Developmental Disabilities*, vol. 27, no. 1, pp. 30–42, 2006.