

# Goal Attainment Scaling: The Technological Journey From Idea to Application

AM

Ann Chapleau, DHS, OTRL

The rapidly growing field of technology has played a crucial role in transforming how health care is delivered, monitored, and reported (Topol, 2012). As the use of mobile devices for clinical practice continues to grow, so do the number of software applications (apps). In fact, in 2015 there were more than 165,000 health-related apps on the market (Terry, 2015). Moreover, a recent survey revealed that although only 16% of health care providers use apps in their clinical practice, 46% plan to do so within the next 5 years to improve the quality of their care (Conn, 2015). This creates opportunities for practitioners to use digital innovations to develop new outcome measurement tools and improve existing ones.

Occupational therapy literature has cited an increasing focus on the need for outcome measurement (Coster, 2013). This is consistent with federal initiatives such as Pay for Performance (American Medical Association, 2016), which provide financial incentives to ensure greater accountability by health care organizations. However, some occupational therapy practitioners are still not consistently incorporating measurement into clinical practice because of lack of knowledge in how to select and use outcome measures, lack of time and administrative support, and a belief that outcome measures lack clinical relevance (Colquhoun, Letts, Law, MacDermid, & Edwards, 2010; Cook, McCluskey, & Bowman, 2007). To address this disconnect between health care mandates and actual clinical practice, outcome measurement processes need to be relevant, user friendly, and efficient.

This article outlines my own process of adopting technology to reduce the logistical challenges I have experienced in using goal attainment scaling (GAS) as an outcome measure. I will describe using GAS in both clinical and academic settings, and a new mobile app that I developed through an interprofessional collaboration with computer science colleagues.

## Goal Attainment Scaling Overview

GAS is not a measure of functional performance, but rather a measure of change over time in level of goal attainment for both individual and program goals in any setting. GAS was developed by Kiresuk and Sherman (1968) to evaluate the efficacy of the then newly formed community mental health centers. It has been increasingly used since then, in pediatric settings (Mailloux et al., 2007; Ruble, McGrew, & Toland, 2012), adult rehabilitation (Bouwens, van Heugten, & Verhey, 2009; Hurn, Kneebone, & Cromptley, 2006), education (Roach & Elliott, 2005), and at least one homeless shelter setting (Chapleau, Seroczynski, Meyers, Lamb, & Buchino, 2012).

The process of GAS begins with an interview with the client or caregivers and may include specific functional assessments that can assist in determining goal areas. Once the therapist has a comprehensive understanding of the client's needs and preferences, the goal scales can be constructed. Rather than creating goals that are either met or unmet, with the client either succeeding or failing, the therapist and client envision a full range of possible outcomes for each goal, using a 5-point scale of +2 to -2, or "much better than expected" to "much less than expected," with 0 as the expected outcome (see Table 1). The level of goal attainment for each goal can be

Table 1. Clinical Goal Scale		
Continuum of Goal Attainment Levels		Record one specific goal behavior that matches each level
Much less than expected outcome	(-2)	Requires maximum assistance to dress upper body (baseline)
Less than expected outcome	(-1)	Requires moderate assistance to dress upper body
Expected outcome	(0)	Requires minimum assistance to dress upper body
More than expected outcome	(+1)	Requires set-up to dress upper body
Much more than expected outcome	(+2)	Independent in dressing upper body

re-evaluated later, both during and post-intervention, to determine any change in the degree of goal attainment.

## GAS for Student Learning

When I began teaching full time, I became interested in assessing student learning. While developing a student clinical experience for a residential hospice setting, I taught students how to use GAS to develop project goals to structure their semester-long experience. Through reflective journaling, students reported that GAS was helpful in keeping them focused on their project goals, when the multiple and changing needs of a community-based setting could be overwhelming and distracting (Chapleau, 2008).

I later became interested in measuring change in student learning during Level I fieldwork. Typical, competency-based fieldwork evaluations are useful in determining what skills each student can demonstrate at midterm and at the end of the clinical experience, but they do not measure change over time in student skill acquisition. Moreover, these evaluations do not encourage or reflect student engagement in identifying personally meaningful professional development goals. We began implementing GAS as an outcome measure in our occupational therapy Level I fieldwork sites in 2013, developing training materials for students and clinical faculty (see Table 2 for an example of a scaled student goal). Quantitative and qualitative findings supported using GAS for assessing student learning as well as providing academic program evaluation data, with GAS scores for professional development goals significantly improved over time (Chapleau & Harrison, 2015). In 2014, we successfully implemented a 1-year interprofessional study using GAS as an outcome measure for fieldwork with occupational therapy, nursing, music therapy, and speech pathology and audiology students (Chapleau, Harrison, Hillenbrand, Roth, & Searing, 2015). Students reported that they

Table 2. Academic Goal Scale		
Continuum of Goal Attainment Levels		Record one specific goal behavior that matches each level
Much less than expected outcome	(-2)	No research conducted into the scholarly literature related to autism (baseline)
Less than expected outcome	(-1)	Will read two articles by end of semester
Expected outcome	(0)	Will read five articles by end of semester
More than expected outcome	(+1)	Will read five articles by midterm
Much more than expected outcome	(+2)	Will read five articles by midterm and will use findings to present a case study to peers by week 7



appreciated a new way of envisioning goals and being asked to personally reflect on goals that were individualized to their needs. They also reported, however, that it was often difficult to find the time to complete the additional paperwork required for GAS.

While GAS was found to be a useful outcome measure in all of these studies, there were limitations that needed to be addressed. First, adequate training in the GAS process is critical, to ensure goals are measurable, objective, and properly scaled. Second, the additional time needed to complete and review the forms by students and clinical supervisors was a challenge. Third, the logistics of distributing and collecting the GAS paper forms for manual data collection, entry, and analysis was challenging.

To resolve these concerns, I partnered with a computer science professor to develop a mobile and web-based app for GAS. Over the course of a year and a half, with funding from the Sammons Center for Innovation and Research in Occupation Based Technology and an internal faculty technology grant, we have created, refined, and implemented the app in all of our Level I fieldwork sites and several classroom-based courses.

We designed the app with a hierarchical structure with three types of users: goal setter (e.g., therapist), supervisor, and administrator, each with specific functions and access to data. The app can be used for clinical, student, and professional development goals as well as departmental or organization program goals. The app allows the therapist, or goal setter, to upload goal statements for each scaled goal through a mobile device or computer. Through the app, the goal setter can easily view goal scales to update progress. Supervisors and administrators are also able to view updated goal scales.

The app's analytics feature allows the goal setter, supervisor, or administrator to view customizable charts and tables illustrating the mean, or average level of goal attainment for all clients on a given caseload, or within a given department, or of the entire organization. No longer will supervisors review data that is 2 or 3 months old, when it is often too late to affect meaningful change. *T*-scores, which reflect change over time in level of goal attainment, can also be generated for research purposes.

Users can learn how to properly scale goals, which is critical to the validity of this outcome measure, through a training video and "how to" app demonstration videos. With support from our occupational therapy faculty, we have created a curricular thread, teaching GAS in both semesters before Level I fieldwork placement. During Level I clinic orientation, we provide onsite training for each clinic to reinforce prior classroom learning, and embed links to the training videos in the course management system. As students learn to use the app, we rely on their feedback to further improve functionality for our anticipated commercial release in 2017.

## Conclusion

My work has opened up a new way of thinking about technology, and in reaching out to other researchers and practitioners who use GAS, I continue to learn more about this method. Perhaps most importantly, I have broadened my understanding of interprofessional collaboration. By working together and learning from each other, we can continue to develop technological products that can improve health care quality and accountability.

## References

American Medical Association. (2016). Pay for performance. Retrieved from <http://bit.ly/2djlQOb>  
Bouwens, S. F. M., van Heugten, C. M., & Verhey, F. R. J. (2009). The practical use

of goal attainment scaling for people with acquired brain injury who receive cognitive rehabilitation. *Clinical Rehabilitation*, 23, 310–320.

Chapleau, A. (2008, April). *Promoting occupational engagement for homeless hospice clients through service learning*. Poster presented at the American Occupational Therapy Association Conference & Expo, Long Beach, California.

Chapleau, A., & Harrison, J. (2015). Fieldwork I program evaluation of student learning using goal attainment scaling. *American Journal of Occupational Therapy*, 69(Suppl. 2). 6912185060p1–6912185060p8. <http://dx.doi.org/10.5014/ajot.2015.018325>

Chapleau, A., Harrison, J., Hillenbrand, K., Roth, E., & Searing, K. (April, 2015). *Goal attainment scaling: An interprofessional assessment of student learning*. Poster presented at the Assessment in Action Conference, Kalamazoo, Michigan.

Chapleau, A., Seroczynski, A. D., Meyers, S., Lamb, K., & Buchino, S. (2012). The effectiveness of a consultation model in community mental health. *Occupational Therapy in Mental Health*, 28, 379–395. <http://dx.doi.org/10.1080/0164212X.2012.708609>

Colquhoun, H., Letts, L., Law, M., MacDermid, J., & Edwards, M. (2010). Feasibility of the Canadian Occupational Performance Measure for routine use. *British Journal of Occupational Therapy*, 73, 48–54.

Conn, J. (2015, November). Easy on those apps: Mobile medical apps gain support, but many lack clinical evidence. *Modern Healthcare*. Retrieved from <http://www.modernhealthcare.com/article/20151128/MAGAZINE/311289981>

Cook, C., McCluskey, A., & Bowman, J. (2007). Occupational therapists report increased use of outcome measures after participation in an education programme. *British Journal of Occupational Therapy*, 70, 487–492.

Coster, W. J. (2013). Making the best match: Selecting outcome measures for clinical trials and outcome studies. *American Journal of Occupational Therapy*, 67, 162–170. <http://dx.doi.org/10.5014/ajot.2013.006015>

Hurn, J., Kneebone, I., & Cropley, M. (2006). Goal setting as an outcome measure: A systematic review. *Clinical Rehabilitation*, 20, 756–772.

Kiresuk, T. J., & Sherman, R. E. (1968). Goal attainment scaling: A general method for evaluating comprehensive community mental health programs. *Community Health Journal*, 4, 443–453.

Mailloux, Z., May-Benson, T. A., Summers, C. A., Miller, L. J., Brett-Green, B., Burke, J. P., ... Schoen, S. A. (2007). Goal attainment scaling as a measure of meaningful outcomes for children with sensory integration disorders. *American Journal of Occupational Therapy*, 61, 254–259. <http://dx.doi.org/10.5014/ajot.61.2.254>

Roach, A. T., & Elliott, S. N. (2005). Goal attainment scaling: An efficient and effective approach to monitoring student progress. *Teaching Exceptional Children*, 37(4), 8–17.

Ruble, L., McGrew, J., & Toland, M. (2012). Goal attainment scaling as an outcome measure in randomized controlled trials of psychosocial interventions in autism. *Journal of Autism and Developmental Disorders*, 42, 1974–1983.

Terry, K. (September, 2015). Number of health apps soars, but use does not always follow. *Medscape*. Retrieved from [www.medscape.com/viewarticle/851226](http://www.medscape.com/viewarticle/851226)

Topol, E. (2012). *The creative destruction of medicine: How the digital revolution will create better health care*. New York: Basic Books.

**Ann Chapleau**, DHS, OTRL, is an associate professor at Western Michigan University in Kalamazoo. She can be reached at [ann.chapleau@wmich.edu](mailto:ann.chapleau@wmich.edu).

## About the Administration & Management SIS

The Administration & Management Special Interest Section (AMSIS) includes occupational therapists and occupational therapy assistants who are engaged in administrative or managerial responsibilities as part of their daily occupations, or who wish to gain knowledge and skills in these areas. The AMSIS has a designated Private Practice and Entrepreneurs Subsection to meet the needs of practitioners who are business owners, entrepreneurs, or in private practice.

- Meet the AMSIS committee members at [www.aota.org/AMSIS](http://www.aota.org/AMSIS).
- Join the OT Connections discussion at [http://otconnections.aota.org/sis\\_forums/f/10.aspx](http://otconnections.aota.org/sis_forums/f/10.aspx).

Copyright © 2016 by the American Occupational Therapy Association.  
This material may not be copied or distributed for personal or educational uses  
without written consent. For use, contact [copyright@ota.org](mailto:copyright@ota.org).