McCLENNAN GROUP

GoodLife™

White Paper

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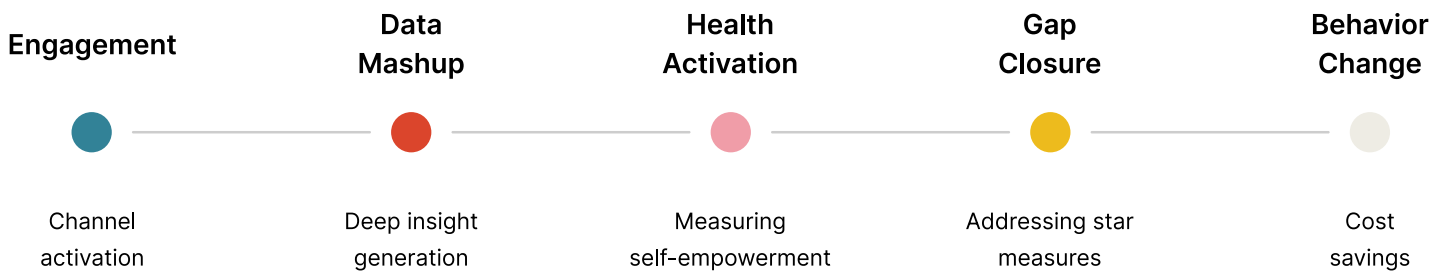
Executive Summary

This white paper series comprises five segments, one segment per part listed below. We created them to demonstrate the comprehensive capabilities of GoodLife™ through a pilot in the health industry with one of the U.S. top 5 payors. The pilot's focus was to validate the hypothesis that our level of personalization helps drive significant savings. If proved true, this would allow the healthcare and life science clients to gain an acquisition and retention strategy for their Medicare Advantage plans.

1. Do You Know Your Patients' Motivation and Values? In this segment we describe a time-tested and device-agnostic card sorting game aimed at collecting end users' behavior, values and motivation. (**Pages 4-7**)
2. How We Use Machine Learning to Stratify Patient Populations? We discuss algorithms and technical skills employed to deliver deep user segmentation. (**Pages 8 - 10**)
3. Say Hello to Personalized Communications in Healthcare. We describe our use of personalized communications that support an experience-of-one for every end-user delivered in an app-less interface through SMS and email. The solution includes a Health Content Library with sequential communications designed to optimize engagement based on your business' product offering. (**Pages 11 -13**)
4. Engagement Secrets: Nudge Theory Meets Edutainment. We delve into behavioral economics techniques derived from social sciences—including decision making, psychology, cognitive studies, and group behavior—used to optimize business metrics. The tool uses fresh formats to inform and 'edutain' end-users for deeper engagement (**Pages 14 - 19**)
5. How We Proved Savings of $1,598 Per Member Per Year. We summarize our data analytics capabilities configured to measure pre-established project and business KPIs (**Pages 20 - 25**)

GoodLife™ is a precision communication solution made possible through a card sorting game designed to collect end users' behavior, motivation & values data. It was developed, and it is currently incubated by McClennan Group, an innovation agency that creates digital products and marketing programs for corporate clients such as IBM, AARP, Humana, Gilead, a major investment company (*stealth*), Blue Cross Blue Shield Carefirst, Partners in Primary Care, and others. We established a KPI continuum that became the foundation for metric measurement throughout all phases of the pilot.



Terminology

Engagement: open and click-through rates, mobile number collection, and other metrics related to our ability to connect with patients

Data mashup: number of unique insights generated from the juxtaposition of datasets (for this pilot, we combined our card sorting data with patient's clinical data and social determinants of health data for their zip codes)

Health activation: focused on measuring, through patient self-reported data, their ability to navigate their own health state

Gap closure: more prevention focused appointments and avoidance of costly actions such as ER visits and specialty visits

> *The percentage of gaps closed was as high as 26.89% (for breast cancer screening). It closed an average of 9.40% additional gaps compared to baseline, and delivered savings of $1,598 per engaged member per year.*
>
> "Data Analytics."

The Value of GoodLife™ can be summarized as follows:

For clients

- Demonstrated ability to steer patients towards services and to support them in the prevention and management of chronic conditions
- Bilateral communication capabilities that capture patients' pain points, challenges, and barriers to better health
- Multiple language capability with strong cultural sensitivity
- Real-time analytics that brings various data sets together and that facilitates decision-making at both individual and aggregate levels
- Overall, true program differentiation for acquisition and retention advantages.

For end-users

- A truly personalized health care program with a built-in "health concierge" offering white-glove attention, communication, and service
- A highly engaging card sorting game designed for health activation, engagement optimization, and trust-building
- Health-promoting, entertaining and personalized communications that meet patients where they are.

This initiative resulted in closing gaps for the following measures

- Breast Cancer Screening
- Colorectal Cancer Screening
- Medication Reconciliation Post-Discharge
- Controlling High Blood Pressure
- Eye Exam
- Poor HbA1c Control
- Medical Attention for Nephropathy
- Statin Use in Persons with Diabetes
- Statin Therapy for Patient with Cardiovascular Disease
- Adult BMI Assessment

The following content can also be found on LinkedIn.

- GoodLife™ Part 1 | Do You Know Your Patients' Motivation and Values?
- GoodLife™ Part 2 | How We Use Machine Learning to Stratify Patient Populations
- GoodLife™ Part 3 | Say Hello to Personalized Communications in Healthcare
- GoodLife™ Part 4 | Engagement Secrets: Nudge Theory Meets Edutainment
- GoodLife™ Part 5 | How We Proved Savings of $1,598 Per Member Per Year

Do You Know Your Patients' Motivation and Values?

Do You Know Your Patients' Motivation and Values?

Section Summary

We created a first of its kind card sorting game designed to collect hard to get non-clinical data in a fun and engaging way. It enjoys as high as an 86.5% completion rate, and it is the main ingredient for personalized experiences.

Healthcare companies have long recognized the importance of engaging patients to improve their business metrics, including acquisition, engagement, and retention. However, few are aggressively pursuing the next generation of engagement opportunities mostly because solutions in the space have failed in their promise to support personalization at scale.

Payor giants, in particular, are locked in a multi-trillion dollar battle to retain patient mindshare and engagement. Healthcare innovators, too, have shown doubts about the feasibility of personalization.

We believe such skepticism stems from a heavy focus on novel user experiences without a strong data foundation. The key to solving the personalization challenge lies in collecting hard-to-get datasets.

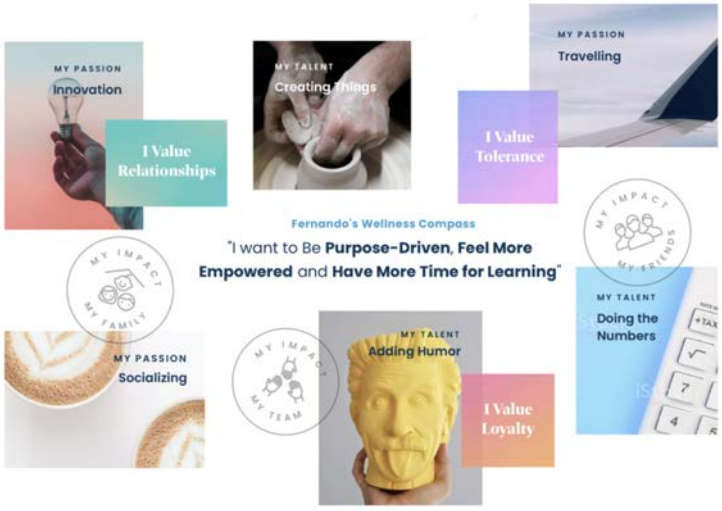
We implemented a device-agnostic card sorting game to collect patients' behavior, values, and motivation with that challenge in mind. It was initially conceived in collaboration with colleagues at AARP's Life Reimagined Institute to help Americans navigate life transitions. We conceived the end-to-end digital experience of the card sorting game while applying behavioral economics and gamification principles to maximize user delight and activity completion rates. More importantly, the card sorting was never used in a health-promoting context. We revisited its original application and theorized that the juxtaposition of card sorting data with social determinants of health and clinical data could deliver a personalized patient journey. Indeed, our innovation provided delightful patient experiences, improved clinical outcomes, and reduced medical costs, as demonstrated by this white paper.

Lastly, the card sorting tool addresses long-standing health and social inequities by ensuring the needs and wants of vulnerable populations are represented and addressed.

Card sorting game: the foundation to a personalized care approach

Patients are invited to pick as many cards as possible before narrowing them down to their top three cards in our card sorting game.

As they progress through the experience, a work-in-progress Purpose Statement is presented with an incomplete section, prompting them to continue. This process is repeated five times until they've assembled a full "Purpose Statement" sentence consisting of their Talents, Passions, Impacts, Values, and Goals (hereafter referred to as TPIVG). At the same time, a compelling collage is produced, capturing what makes each individual tick. Patients can share both the collage and the "Purpose Statement".

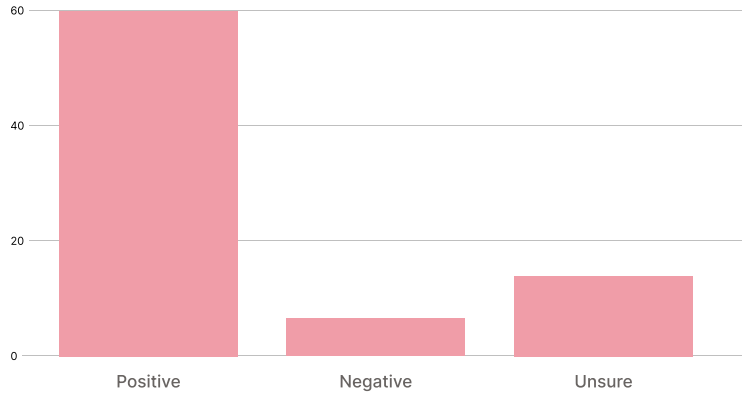


In our hypothesis, the benefit of using a card sorting activity in a health context points to theories of intrinsic motivation, which is central to one's engagement and maintenance of health. Studies have shown that tapping into patients' intrinsic motivation (acting for the inherent enjoyment of the activity involved) is the most autonomous form of motivation. And, when the desired

behavior isn't inherently enjoyable, one may still be autonomously motivated through integrated regulation (i.e., acting in line with one's own goals and values). Honoring each patient's individuality and reminding them of what makes them unique ensures greater adherence and engagement throughout any initiative.

Guided by our Human-Centered Design steps, we conducted primary research with Medicare Advantage patients to measure the perception of value around our tool (before engaging them in our program). Overall, results showed that most participants indicated that the activity was positive.

When asked directly about some of the critical experience aspects of the interface, respondents were generally happy with it. Responses skewed positively for all aspects of this question. Respondents especially found that the activity was easy to use and took the right amount of time.



How much do you agree with the following about the activity?

	Easy to use	Helped me identify what makes me unique	Provided me with a readout that felt personalized	Took the right amount of time
Agree	45	34	34	41
Somewhat Agree	11	18	17	13
Neither Agree Nor Disagree	8	9	11	11
Somewhat Disagree	3	4	2	1
Disagree	0	2	3	1

In terms of qualitative feedback, participants generally indicated that the activity helped them think about themselves honestly and gain insight into their wants and needs:

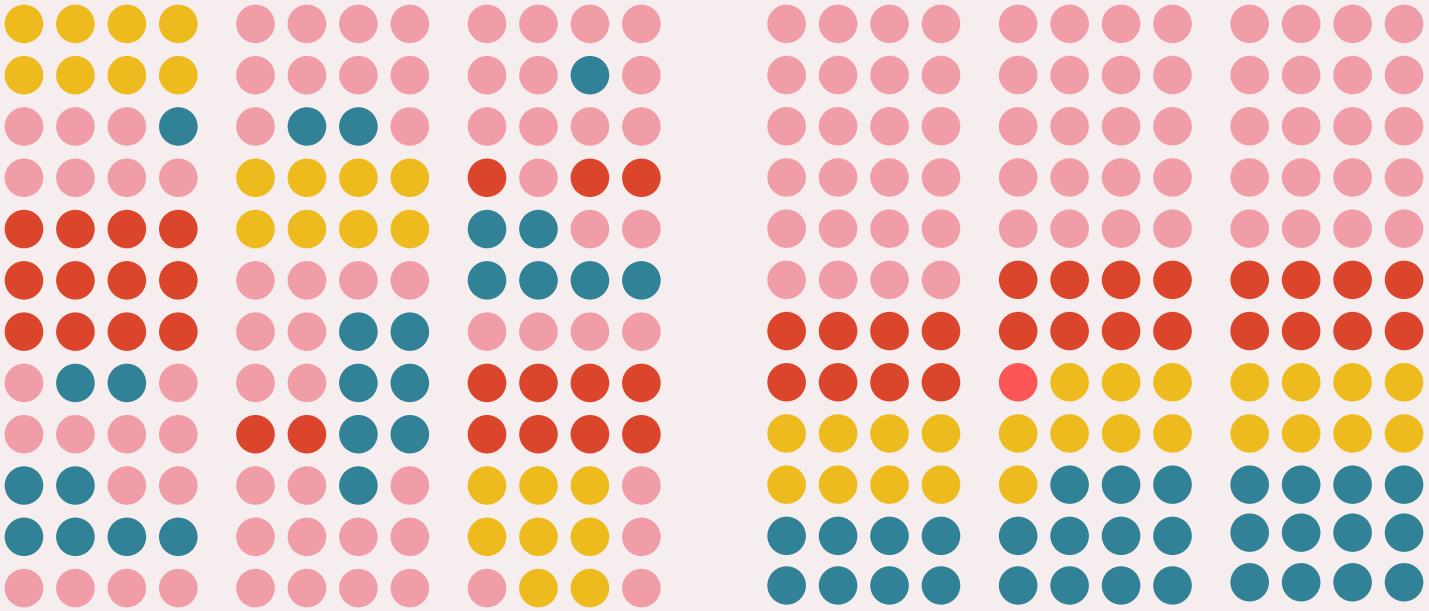
- "A method to allow me to put into words my priorities."
- "Makes you focus on what you believe in or care about"
- "Makes you stop and think about what is important in your life and helps you to see what goals you can achieve."
- "This might help me in figuring out what I should do next with my life."
- "The activity allowed me to understand more about my own personal needs and desires."

“It was empowering to see it in print.”
- “It sharpened my focus on my life”

After research validation, we customized the card sorting tool for our client—look and feel, data collected, etc. One month into the campaign, the card sorting enjoyed an as high as 86.5% completion rate among the selected population of Medicare Advantage patients.

For this metric, we only counted the ones who started the experience.

How We Use Machine Learning to Stratify Patient Populations



How We Use Machine Learning to Stratify Patient Populations

Section Summary

This segment describes how we use machine learning (silhouette analysis, K-means) to stratify members, and generate cohort insights. We also describe our communication framework for optimal communication relevance.

The Problem at The Heart of Personalization

In the post-COVID-19 period, traumatic stress, social isolation, unemployment, and even food insecurity completely re-shaped experiences around the whole planet, resulting in brands losing touch with their customers/end-users. In the health sector specifically, research has shown that 80% of what makes up someone's health is determined by what happens outside of the doctor's office. Not surprisingly, the pandemic aggravated existing behavioral health conditions. Many individuals became more vulnerable to new diseases. This growing burden has caused significant strains on American lives and, consequently, has increased the challenge for population health leaders. Common failures of their programs entail a lack of relevance in messaging; and an inability to address a broad range of psychosocial (i.e., depression), structural (i.e., transport), clinic-based (i.e., no access, waiting times, etc.), and other barriers (i.e., stigma and others, alone or in combination).

The Missing Link in Patient Intelligence

- In this section, we will dive into our use of data science to combine 101.9 MM data points to create dynamic segments infused with insights. The payor assigned 80k lives to this pilot, and datasets included:
- Motivation and Values: collected once through our card sorting game data
- Compliance report at the member level (provided weekly)
- Clinical health data (PHI, PII) (provided weekly)
- Payor-provided SDOH datag components and

The datasets above are blended to generate insights such as psychological drivers, preferences, attitude formation, and decision making. We deploy machine learning algorithms capable of handling a dataset that is far more complex and multidimensional than the human mind can evaluate. ML algorithms include:

- We used **clustering algorithms** to identify groups of similar or related data points. Our model uses K–means, a centroid-based clustering algorithm that identifies groups of program participants with common characteristics. By leveraging GLM card sorting data in machine learning models to understand each patient's goals, values, passions, impacts, and talents, we can scalably identify impactful messaging components and customize communication to be as effective as possible.
- **Silhouette Analysis** measures the distances between data clusters at various numbers (K) of clusters. Leveraging silhouette analysis is a very effective methodology for dividing program participants into segments as it creates the least amount of feature overlap between individuals in different clusters. To find the optimal number of clusters (the "K" in K-means), we chose the value with the highest distance (expressed in the silhouette coefficient). For this data set, the highest feasible silhouette coefficient is at K=3. Segmenting the lives into 3 clusters was a more accurate way to segment the clusters than segmenting the lives into 2, 4, or 5 clusters because the clusters' distances were greatest at K=3.
- We learned—and can substantiate—the optimal way to dynamically group members into cohorts by using clustering algorithms and silhouette analysis. As a result, we could understand similar characteristics and features between cohorts and dissect the differences that set them apart. Here is one of the cohorts that came out of this body of work.
- The Social-oriented cluster comprises social butterflies. They prioritize their friendships and other relationships, and the desire to be loved and bring joy to others.

Other clusters included the Action-oriented individuals who prioritize an active values and independence; and the Spirituality-oriented cluster of individuals who prioritize a sense of belonging in their community and who tend to adopt their peers' behavior.

Social Enthusiasts are the social butterflies. They prioritize their friendships and other relationships. They desire to be loved and bring joy to others.

Goals

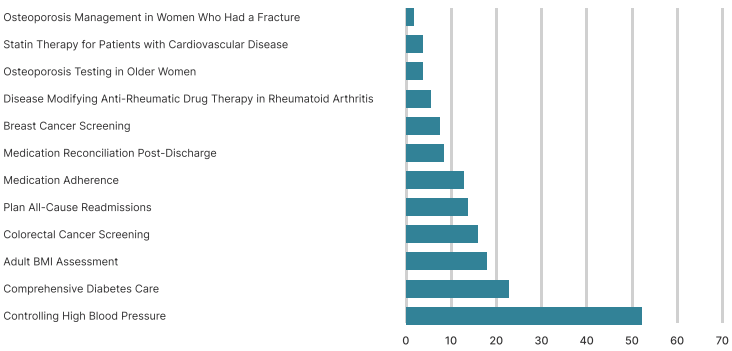
- Be loved - **19.2%**
- Have more time with the family - **14.1%**
- Be appreciated - **10.6%**

Potential Tones

- Charismatic
- Unexpected & Witty
- Helpful

Personality

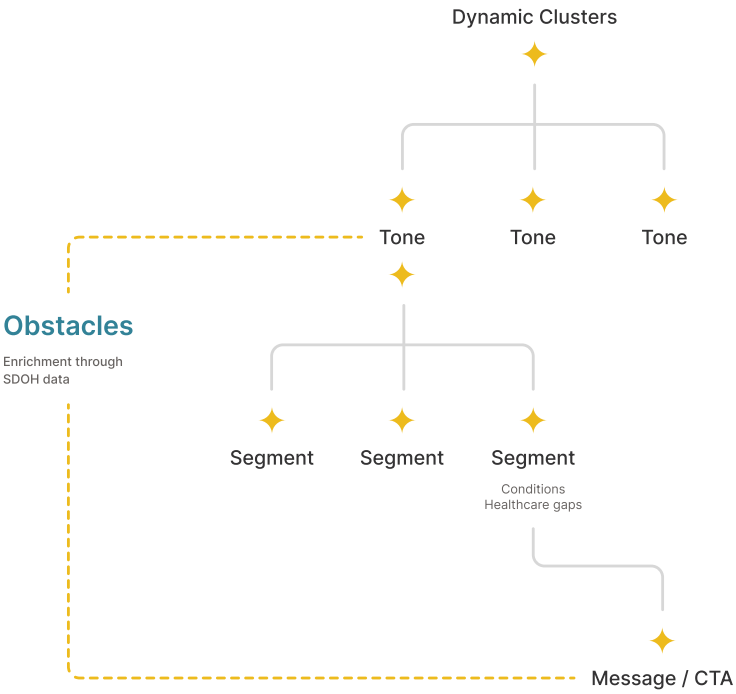
Introvert	●●●●●	Extrovert
Passive	●●○○○	Active
Analytical	●●●○○	
Creative	●●●○○	
Loyal	●●●●●	



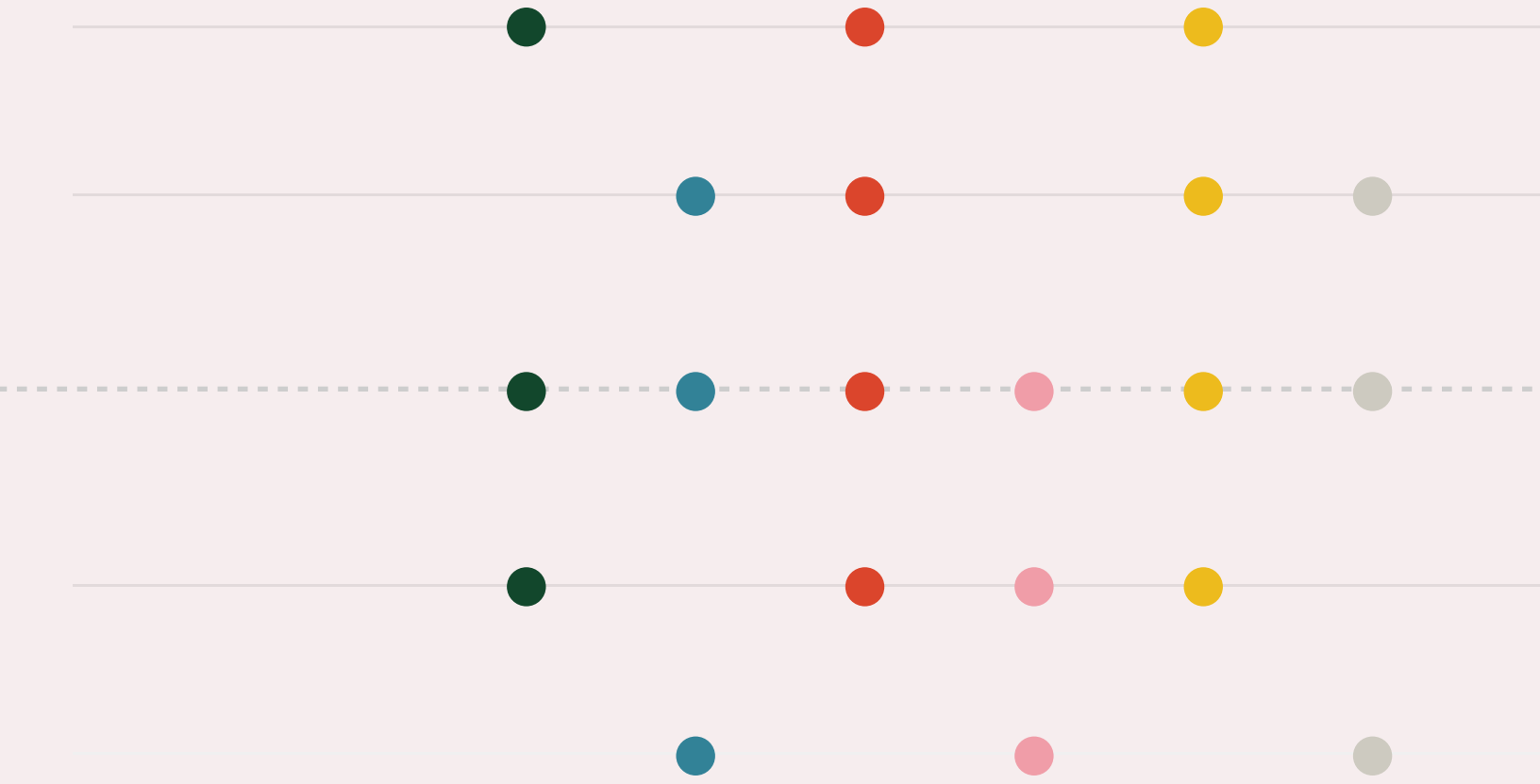
We used dynamic segments to drive communication briefs in various ways. The Machine Learning diagram below depicts our framework and strategy for communications. Firstly, dynamic clusters correlate directly to tone. And each cluster is further segmented by conditions and healthcare gaps which drive overall content, subject lines, and CTAs. Additionally, tones are constantly enhanced by how users respond to the communications. For example, if during our communications with a particular member we perceive an SDOH barrier, messages will shift to conform to their reality.

Machine Learning

As a result, we produced 150 communication streams with bilateral capabilities, i.e., the ability to collect information from users along the way.



Say Hello to Personalized Communications in Healthcare



Say Hello to Personalized Communications in Healthcare

Section Summary

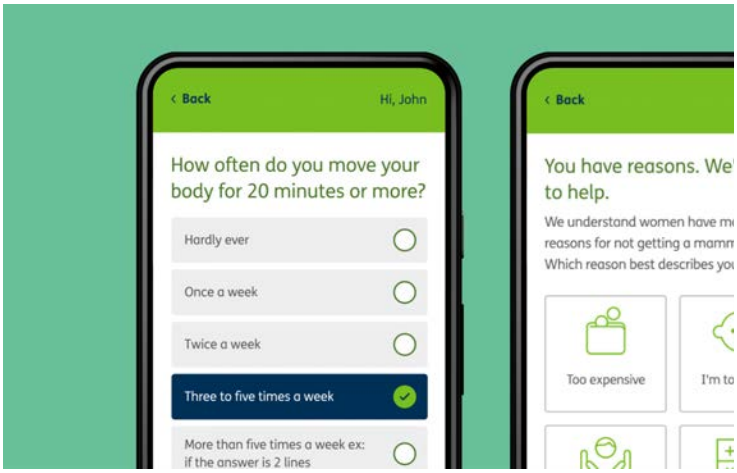
Deep personalization entails lots of content variation for various dynamic cohorts. We created a Health Content Library with NYU Langone Health professionals and enabled bilateral communications for deep listening. We go over the stack we used for delivering complex, ongoing communication streams.

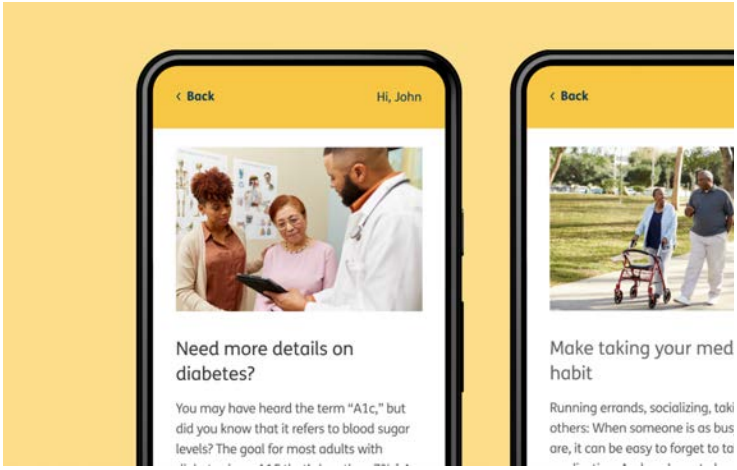
With a rich set of highly personalized data, GoodLife™ has been creating a Health Content Library, the home of a series of sequential communications designed to educate people around basic principles of health management. Antoinette M. Schoenthaler, EdD, Associate Professor, Associate Director of Center for Healthful Behavior Change, Institute for Excellence in Health Equity, spearheads content production from a medical point of view. The goal of our Health Content Library is to empower individuals to adopt positive behaviors. We conceived them as streams of ongoing dialogue delivered by either text or email; users tell us their preferred channel of communications after opting into the program.

Health Content Library

Track Name	Email Subject	Sub Tracks
Onboarding & setting goals	Your Health Engagement Profile is waiting	4
Needs/Challenges, segmented	What's your biggest well-being challenge lately?	6
Taking Control of Your Condition/Health	Ready to take control of your health?	6
Prioritizing self-management behaviors/habits for better control	✓ Which 6 habits may impact your well-being?	6
Overcoming challenges (barriers) to behavior/habit change	New healthy habits are on the horizon	7
Supporting Change - Behaviors/Habits	Have you been trying out new healthy habits?	7
Importance of communication/getting user feedback	How are we doing so far?	4
Staying on top of your medication	Need help staying on top of your medication?	2
Supporting Someone with Chronic Disease	How can we best support you?	1
Keeping track of your medicines	Taking multiple meds, vitamins or supplements?	1
Older adults and multivitamins	Do you need a multivitamin?	1
Supporting change/Medication adherence	How's it going taking your medications?	1
Healthy Aging	Healthy aging tips? Right this way	3
Baseline Measures	Well-being is a work in progress	2
Annual Wellness Visit	We have new educational tips to help meet your health goals	1
Cholesterol: The Good, Bad, and Ugly	Happening today: Controlling your health	3
Control HTN	How can you do more of what you love?	6
Living Healthy with Diabetes - Eye Health (Diabetes Control)	Life of the party? Let's keep you going with these educational tips	6
Eye Health	We have educational tips to help you stay social	3
Staying on top of your diabetes	Health concerns getting in the way of socializing?	9
Fall Prevention	Helpful hints to keep you going strong + steady? We've got those	6
The importance of blood pressure for COPD and RA	Going to socialize? Read these tips first	6
Incontinence	! These strategies may boost your quality of life	3
Staying Active at Every Weight	Ready to be a mover and shaker?	4
Revisit Measures	Your answers have an impact	7
Total Sub Tracks:		108

Samples of Bi-Lateral Communication

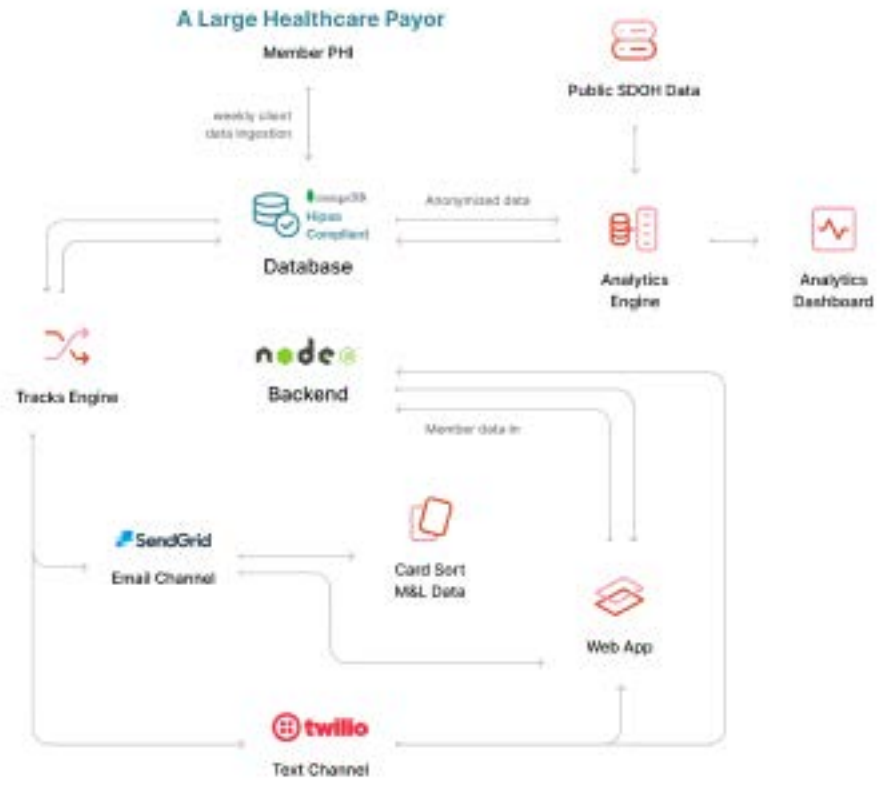




As the user experiences progress, we keep our stream of communication conversational by allowing users to provide us with self-reported data, including their personal goals, barriers, distractions, reasons patients miss appointments, etc. During these frictionless conversations, the most revealing data about end-users surfaces.

End-users are happy to share them as trust has been established over time; also, they understand there's a payoff for every data point shared. Here are some examples:

Technology Infrastructure



Here's a snapshot of GLM's communication backbone. It also includes

- SDOH data curated from a variety of public databases
- An analytics engine designed to power our real-time analytics dashboard (covered in greater detail on pages 24-25)
- Member PHI, provided by the large payor every week and including claims data allowing us to measure gap closures
- A HIPAA-compliant database designed to hold member PHI as well as the communication streams and card sorting data
- SendGrid and Twilio implementations designed to maximize the deliverability of content
- A web application that provides users with a responsive experience, no app download needed.

Engagement Secrets: Nudge Theory Meets Edutainment

Engagement Secrets: Nudge Theory Meets Edutainment

Section Summary

Left unchecked, subconscious bias will undermine patients' choices. We use behavioral economics, and edutainment, to improve their decision-making.

After experimenting with a couple of behavioral economics frameworks, we adopted the BASIC toolkit developed by the Organisation for Economic Co-operation and Development (OECD), an international organization that works to build better policies for better lives.

The BASIC toolkit consists of lessons derived from the behavioral and social sciences—including psychology, cognitive sciences, and group behavior—to provide adopters with a step-by-step process for analyzing a problem, building strategies, and developing behaviorally informed interventions.

More specifically, the BASIC Toolkit includes the well-popularized ABCD wheel comprised of the following concepts:

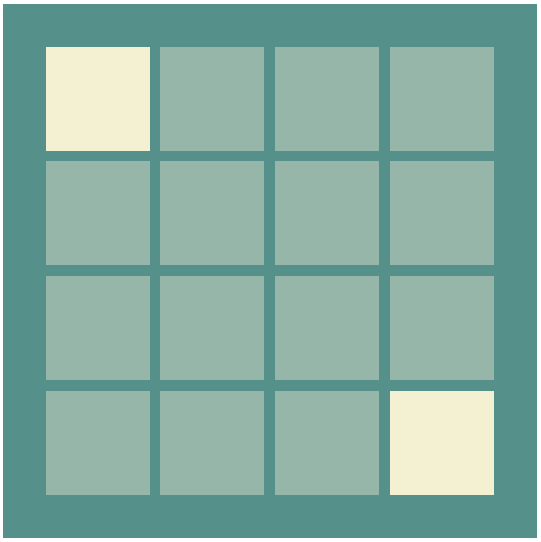
- Attention: People have limited attention and recall but tend to respond to environmental cues.
- Belief formation: People tend to underestimate the speed and be overconfident when performing tasks
- Choice: People tend to align with the behavior of others and what others think is appropriate.
- Determination: people have difficulty staying motivated if left to their own devices without any plans and feedback.

Behavioral economics interventions typically include health promotion messages called “nudges.” They are grounded in the idea that, while individuals often behave irrationally, irrational behavior is predictable and therefore presents an opportunity for intervention.

Combining the power of analytics to personalize content and target the most prominent and costliest care gaps using behavioral economics enables us to increase our impact on member behavior in the areas that matter most to their health and well-being.

A variety of evidence-based strategies to impact behavior exists. Our systematic approach to developing and implementing these strategies allows us to monitor, test, and tweak tactics based on their success. Following are some examples of behavioral economic strategies employed in GoodLife™ (GLM) content:

Hick's Law



The time it takes to make decisions increases with the number and complexity of choices.

Origin: Hick's Law is named after a British and an American psychologist duo, William Edmund Hick and Ray Hyman. The pair examined the relationship between the number of stimuli and an individual's reaction time to any given stimulus. Expectedly, the more stimuli to choose from, the longer it takes the user to make a decision on which one to interact with. Too many choices require time to interpret and decide, giving individuals work they don't want.

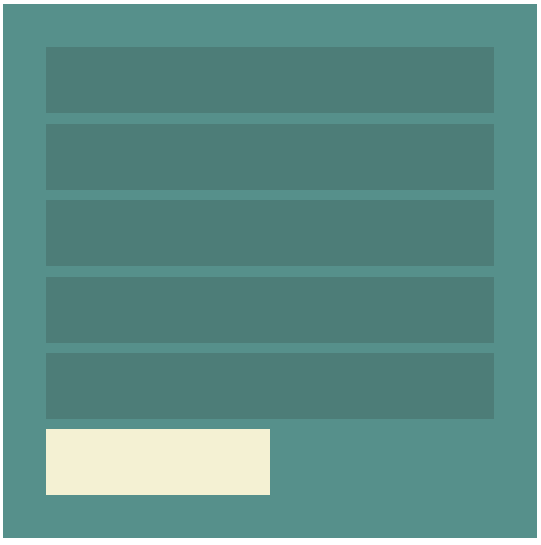
Program application: more often than not, program participants suffered from multiple chronic conditions, and their medical records indicated that, various

gaps needed to be closed across an array of measures. Part of our strategy entailed prioritizing those gaps by their capacity to impact an individual's health while considering willingness and ability to perform gap closure—as opposed to, say, exposing all open gaps to individuals on a 'menu.' By taking a one-gap-at-a-time serial approach, we maximized attention windows, embraced simplicity and focus as attributes of our user experience, and ensured higher gap closure rates.

Principles followed:

- We minimized the number of choices when possible.
- We broke complex tasks into smaller steps to decrease cognitive overload.
- We avoided overwhelming users by exposing gaps in care we had access to
- For users we deemed "on a streak," we made it possible for them to consume content at a faster pace, albeit still serially.

Zeigarnik Effect

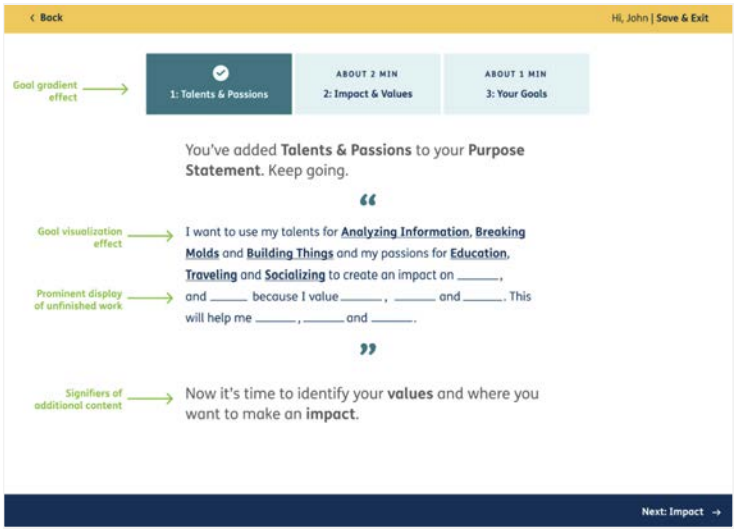


People remember uncompleted or interrupted tasks better than completed tasks.

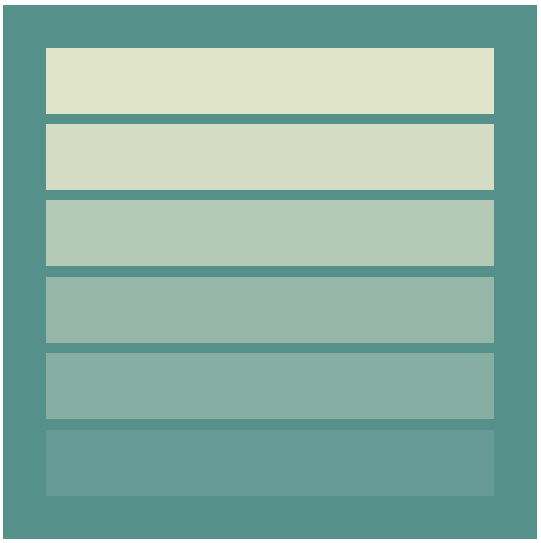
Origins: Bluma Wulfovna Zeigarnik (1900 – 1988) was a Lithuanian psychologist and psychiatrist and a member of the Berlin School of experimental psychology. In the 1920s, she studied memory and found that incomplete tasks are easier to remember than completed ones. Program application: When we conceived our card sorting user experience, we ran focus groups using physical cards before building the digital experience to gather learnings across various measures. Results showed that—at least in a physical setting—most users loved the activity, but we were immediately concerned about the time needed to complete it. Would users in the digital space have as much patience to plow through an action that took on average 4 minutes (and sometimes as much as 8 min) to complete? Without hesitation, our first iteration of the digital card sorting game applied the principles of the Zeigarnik effect by dividing the experience into three steps while deliberately establishing a task-specific tension and highlighting the unfinished work prominently. At the same time, a progress bar urges users to complete their activity for the satisfaction of seeing the progression bar fill up and get over the “completed canvas” cliff-hanger.

Principles followed:

- On our card sorting experience, we provided clear signifiers of additional content, propelling individuals towards the experience apex—the reveal of their talents, passions, values, impact, and goals
- We introduced artificial progress screens—an incomplete sentence with missing words—to keep them motivated and curious about completing the experience.
- We prominently indicated progress to frame the entire experience as something achievable for them.



Loss framed incentive



When encouraging individuals to take action, the potential to lose a financial reward is more effective than gaining one.

At McClennan Group we have been fans of U Penn's Nudge Unit and have been following the work of Founding Director Dr. Mitesh Patel since he launched the program in 2016. His team grew to more than 20 professionals from humble beginnings within three years. From 2016 to 2021, the Penn Medicine Nudge Unit worked on more than 100 projects, including more than 25 randomized trials resulting in over 75 publications in leading medical journals such as NEJM, JAMA, Nature, and PNAS. In 2018, the team launched an inaugural Nudges in Health Care Symposium to bring together health systems interested in using nudges or developing nudge units to improve health care. In particular, our team was drawn by the Nudge Unit's study, which tested the effectiveness of three methods of financial incentives to increase physical activity among overweight and obese adults. By providing incentives of equal amounts, the team tried to determine which program was most effective at motivating participants to increase physical activity.

Results showed that offering a $1.40 reward each time the goal is achieved (the gain incentive group), or when daily lotteries were offered, were no more effective than not offering a reward at all (the control group). In those groups, participants achieved the daily goal of approximately 30 to 35 percent. However, participants who risked losing the reward they'd already been given (the loss incentive group) achieved the goal 45 percent of the time, amounting to an almost 50 percent increase over the control group. These findings suggest that framing a financial incentive is vital in determining its success.

We intend to incorporate these findings into a program designed to help individuals close care gaps. Our partner payor already has a program that mimics the study's "gain incentive group", i.e., individuals are already being rewarded for positive steps. Since the potential of losing a reward is a more powerful motivator, our proposal is for a redesign of the incentive strategy for the control group while keeping the placebo group running on the status quo incentive program.

Other tactics we use in the program:

Transparency effect: We believe being honest with people about our "gap closure agenda" doesn't reduce their effectiveness. With bots becoming ubiquitous, there's never been a more crucial time to discuss the role of transparency in how information is being shared and presented.

Bruns, H., Kantorowicz-Reznichenko, E., Klement, K., Luistro Jonsson, M., & Rahali, B. (2018). Can Nudges Be Transparent and Yet Effective? Journal of Economic Psychology, Volume 65, Pages 41-59

Social Proof: We tend to copy others; behavior, especially when facing new situations. Additionally, we are most influenced by people we deem similar to ourselves. Role models also influence our decisions heavily.

Bandura & Menlove (1968). Factors determining vicarious extinction through symbolic modeling. Journal of Personality and Social Psychology.

Salience: Our choices are determined by how information is designed and shown. When creating user experiences, what we reveal, how prominent it is, when it appears—or whether we instead choose to keep it hidden—all affect decisions significantly.

Blake, T., Moshary, S., Sweeney, K., & Tadelis, S. (2021). Price salience and product choice. Marketing Science.

The Power of Edutainment

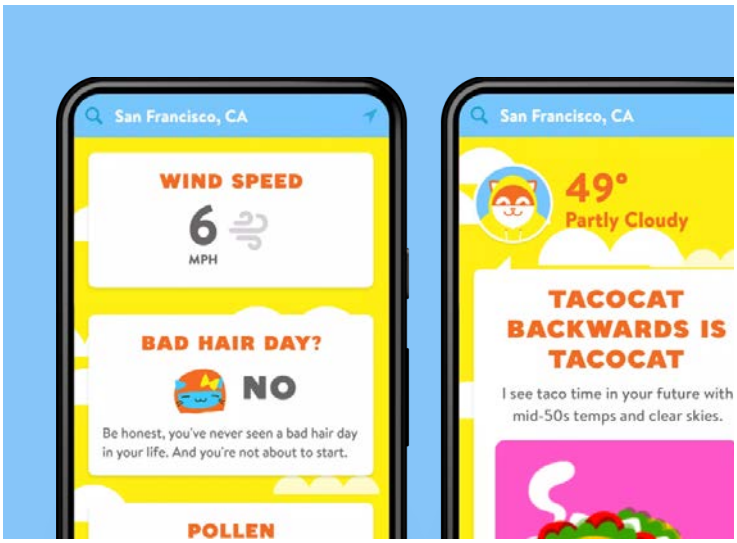
As adopters of behavioral economics, we also had to pay extra attention to patients' willingness and ability to engage with our content. The approach we take at McClennan Group includes the use of 'edutaining' content. Edutainment is defined as the act of learning through a medium that simultaneously educates and entertains. Although the Walt Disney Company is credited with having coined the term, the concept of engaging while educating goes back at least as far as the colonial days of Ben Franklin and his Poor Richard's Almanac.

In the health sector, edutainment has been a recognized approach to delivering complex messages while building awareness on various issues.

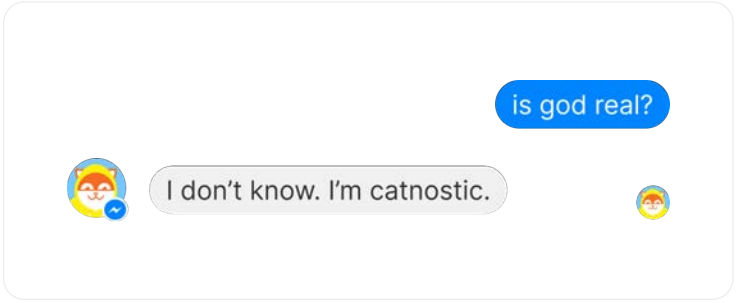
In the case of populations with lower literacy levels, processing health information can be difficult. Presenting health information in an audiovisual format, such as animation, comic strips, diagrams, and others, improves understanding among those individuals. Cutting through the social media clutter

We joke, at our agency, that every project we work on competes against Netflix — not against its content, but for everyone's attention and mindshare — and that is certainly the case in health-related initiatives.

A straightforward and inspiring example we often reference is Poncho, the Weather Cat—a simple weather service with a personality delivered to subscribed users daily. Their inventor, Kuan Huang, asked himself a simple question: "does the weather forecast need to be boring?" They thought personal forecasts should fit into individuals' life seamlessly. Their super simple mobile-first design featured a short, sweet copy that was infectiously funny and chock full of puns; you'll look forward to getting these messages every morning. They do a fantastic job of incorporating funny photos, Internet memes, and hypnotizing animated gifs.



What started as an email and text service eventually grew into an app and, subsequently, into a bot. And in a space where bots proved themselves incapable of handling trivial conversation, Poncho was often able to respond with grace and wit.



Poncho was sold by its parent company, Betaworks, to Dirty Lemon, a beverage startup.

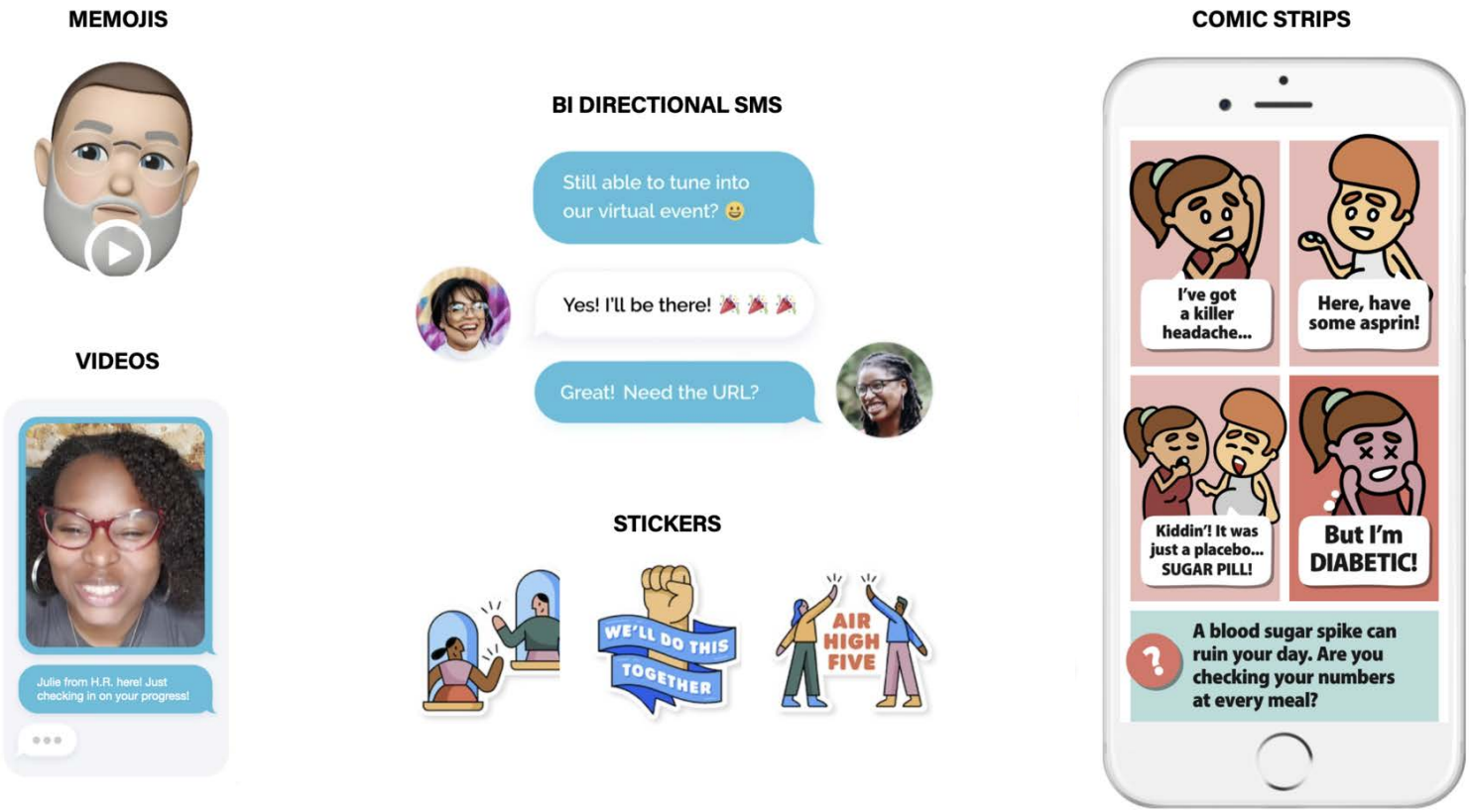
Our vision for fresh formats starts with something Poncho taught us, which is the principle of keeping the tone conversational. Developing content in plain, everyday language means individuals can understand our content the first time they read it; it's approachable and meets them where they are. We also resort to a familiar language, avoiding jargon at all costs.

Our range of formats includes and is continuously evolving:

- HIPAA-compliant bidirectional/conversational SMS: most successful with a conversational tone, much like Poncho
- Talking Doctor Videos: use of authority or subject matter experts to build credibility and trust
- Storytelling/Animated Videos- to bring thoughts and ideas to life in unexpected and imaginative ways
- Cartoons/Webtoons: for a sense of playfulness and relatability to form a dialogue
- Emojis, Memojis: use of animation blended with authentic voices to make facts and figures, for example, more digestible
- Stickers: for peer to peer dissemination of simple CTAs

We are constantly adding new formats as they are invented and tested. They are carefully selected based on project goals, the cohort's literacy level, age, call-to-action, and culture/language. We cannot stress enough that cultural relevance goes beyond just language—we also consider cultural beliefs, knowledge, superstitions, values, and other variables.

Format options



How We Proved Savings of $1,598 Per Member Per Year

How We Proved Savings of $1,598 Per Member Per Year

Section Summary

Everyone needs to know ROI—for the right reasons. This section describes how we set up test and control groups for rigorous KPI measurement; and how we constructed an analytics dashboard for displaying engagement, gap closure and cost savings in real-time.

To evaluate the impact of the program, two groups were set up: "test" group (exposed to standard Humana communications & GoodLife™ personalized content) and a lookalike "control" group (exposed only to Humana communications). Comparing these two groups provides insight into how effective the program is. In order to increase confidence in the ability to compare the two groups, additional analysis was performed to confirm the level of similarity between them.

Chi-square

To confirm program participants and non-program participants were similar enough to be compared in a test vs. control study, a chi-square goodness of fit test was leveraged. Chi-square evaluates whether sample data is representative of the full population. We used a chi-square goodness of fit test to examine the proportions of people in the test group that have certain attributes compared to the proportions of people in the control group that have those attributes. Our chi-square analysis indicated that the test group had a higher proportion of the "adult BMI assessment" requirement than the control group, and a lower proportion of the "statin use in persons with diabetes" requirement, but that the proportions of the various healthcare needs were similar overall.

Z-Score/P-value

To assess the significance of the increase in success rate among program participants (the "test group"), a 2 sample test of proportions was used to generate a z-score and a p-value. In a 2 sample test of proportions, the z-score tells us where the difference in the success rate falls (in number of standard deviations) in relation to the expected value (or "control group" value). A z-score close to 0 tells us that the success rate for the program participants is about average. A negative number indicates that the results are below average, whereas a positive number indicates that the success rate is above average. The p-value tells us the probability that value was reached solely due to chance. We reject the notion that the value was reached due to chance (the "null hypothesis") if the p-value is less than 0.05.

In formula beside:

- $\hat{p}$ is Sample Proportion
- p0 is Assumed Population Proportion in the Null Hypothesis
- n is the Sample Size

$$Z = \frac{\hat{p} - p0}{\sqrt{\frac{p0\,(1 - p0)}{n}}}$$

To verify the effectiveness of our program, we designed a test to measure the higher gap closure rates among program participants. Then, to quantify the significance of these findings, we analyzed the results and calculated z-Scores and p-Values for each result. As expected the results clearly show that the program increases gap closures, and that the increase is statistically significant. Finally we used available gap care cost data to quantify the cost savings that were passed on to the payor which can be attributed to the increase in gap closures.

Outcomes

The gap closure rates for the test and control groups were compared for each measure, calculating the delta between each. The delta was then applied to the total group size for each measure to find the incremental gap closures, or the number of gaps closed in the test group due to the increased closure rates.

Our test results show both that there was an increase in gap closures among program participants and the increase in gap closures was statistically significant (at $p<0.05$) for 6 out of the 9 gaps (only gaps with sufficient data were assessed). The increase in gap closures overall was statistically significant as well.

Successful Gap Closure Results

Measure	Test Group % of gaps closed	Control Group % of gaps closed	Z-score	P-value	Significant at p < .05	△ in %
Breast Cancer Screening	69.23%	42.34%	42.34%	0.00	Yes	26.89%
Colorectal Cancer Screening	43.27%	21.13%	21.13%	0.00	Yes	22.14%
Annual Wellness Visit	43.27%	21.13%	21.13%	0.00	Yes	9.53%
Medication Reconciliation Post-Discharge	27.94%	18.44%	18.44%	0.05	Yes	9.51%
Controlling High Blood Pressure	41.38%	34.59%	34.59%	0.00	Yes	6.8%
Comprehensive Diabetes Care	58.94%	53.52%	53.52%	0.01	Yes	5.42%
Statin Use in Persons with Diabetes	84.27%	38.91%	38.91%	0.08	No	45.36%
Statin Therapy for Patient with Cardiovascular Disease	73.02%	0.50	0.50	0.50	No	3.98%
Adult BMI Assessment	30.07%	27.35%	27.35%	0.30	No	2.72%
Total			**11.62**	**0.00**	**Yes**	**9.40%**

An average reduction in gaps of care of 9.4% was observed—as much as 26.89% in the case of breast cancer screening.

We then compiled annualized average cost savings for each measure we tracked. For example, for each member that completes their Breast Cancer Screening, payor enjoys an average cost saving of USD 12,000 per member per year (data sources available):

Measure	Average cost savings per year	Incremental gap closures (%)	Incremental gap closures (△)	Total Savings
Breast Cancer Screening	$12,000	26.89%	63	$755,080
Colorectal Cancer Screening	$12,000	22.14%	54	$650,845
Annual Wellness Visit	$281	9.53%	81	$22,790
Medication Reconciliation Post-Discharge	-	9.51%	6	-
Controlling High Blood Pressure	$2500	6.80%	50	$125,118
Comprehensive Diabetes Care	$396	3.13%	6	$2,342
Statin Use in Persons with Diabetes	$975	10.97%	19	$18,182
Statin Therapy for Patient with Cardiovascular Disease	$2,503	4.52%	10	$25,907
Statin Therapy for Patient with Cardiovascular Disease	-	45.36%	11	-
Statin Therapy for Patient with Cardiovascular Disease	-	3.98%	3	-
Statin Therapy for Patient with Cardiovascular Disease	$3,508	2.72%	8	$28,241
Total		**9.40%**	**342**	**$1.63 MM**

160 MM

At 101,900 engaged lives

16 MM

At 10,190 engaged lives

$1.6 MM

At 1,019 engaged lives

This analysis resulted in an estimated annual savings of $1.62 million for 1,019 engaged lives, or $1,598 per engaged life per year. Definition of engaged life is a user who opted into the program. These estimated savings can be attributed to the effectiveness of the program and can be combined with program costs to determine the return on investment.

Other Outcomes and Findings Related to Pilot Performance

Some of the top performing Emails by subject are: “Complete your Health Engagement Profile readout today” with a unique open rate of 69.7% and unique click rate of 51.5% - as well as, “What’s the next step in your Health Engagement Profile?” with a unique open rate of 73.5% and unique click rate of 94.4%. This Email had lower volume (49 deliveries) but the highest rates.

41.6% of patients successfully completed the activity designed to collect baseline measures where they contributed with information about their ability to manage their own health.

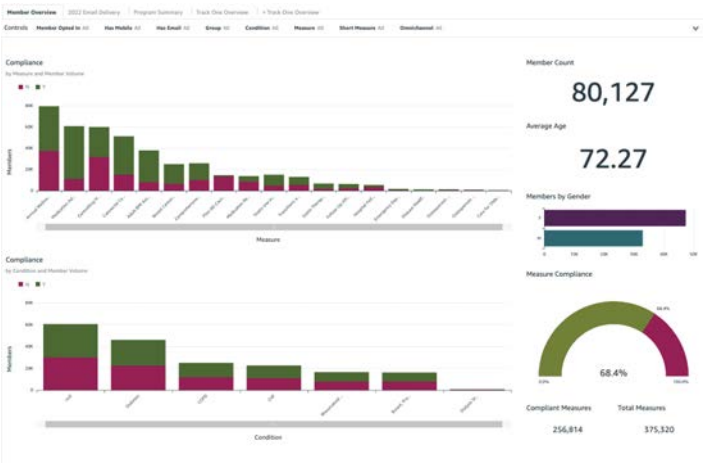
The Spiritual-oriented cluster performed best in the following activities: “Setting personal goals” and “Self-management behaviors & habits for better self-control”

The Action-oriented cluster resonated the most with content around “Healthy Aging”. As a self-sufficient cohort, they were less interested in content such as “Needs & Challenges” and “Keeping track of medications” (although they paid close attention to communications around “change in medication”).

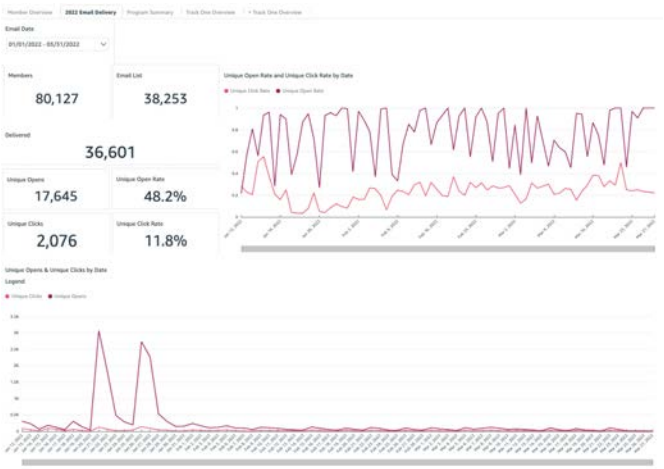
The Social-oriented cluster had great interest in activities such as “Staying on top of your medication” and “Keeping track of your medications”, indicating that they are the most likely to seek assistance with medication management. They also gravitated towards “Needs & challenges”, “Prioritizing habits for better self-control”, and “Supporting behavior change” (although they were less interested in “Overcoming challenges to behavior/habit change”). Lastly, they didn’t show much interest in “Healthy aging” compared to other segments.

Real-time Dashboards

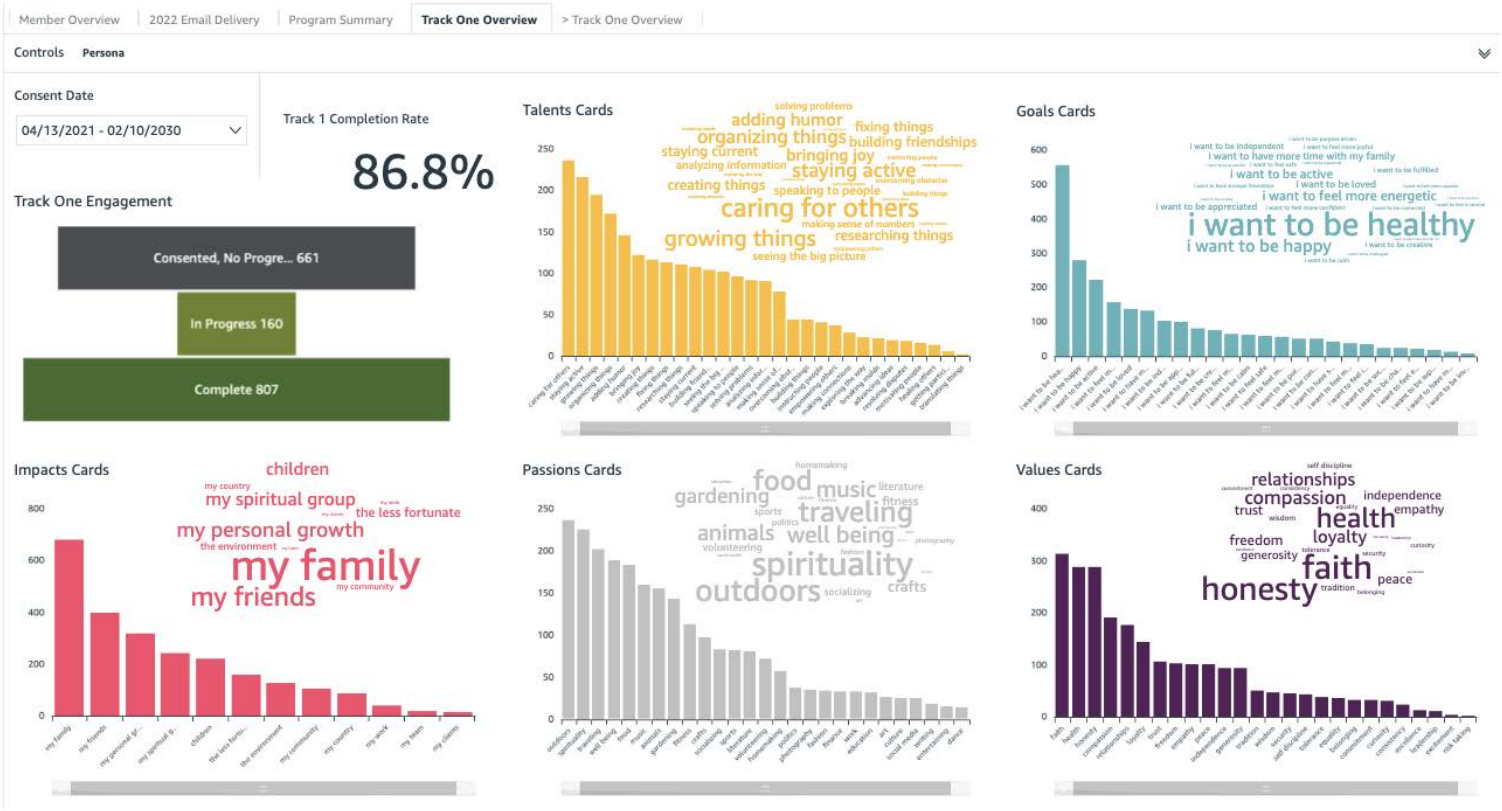
Precision-communication demands increased rigor in measurements of results. The custom-built, real time Analytics Dashboard delivers intelligence around key performance indicators, and allows our partners to adapt and change direction as needed. The Analytics Dashboard can be accessed by a variety of users with various permissions levels, and was designed to be standalone or integrated with the payor’s system.



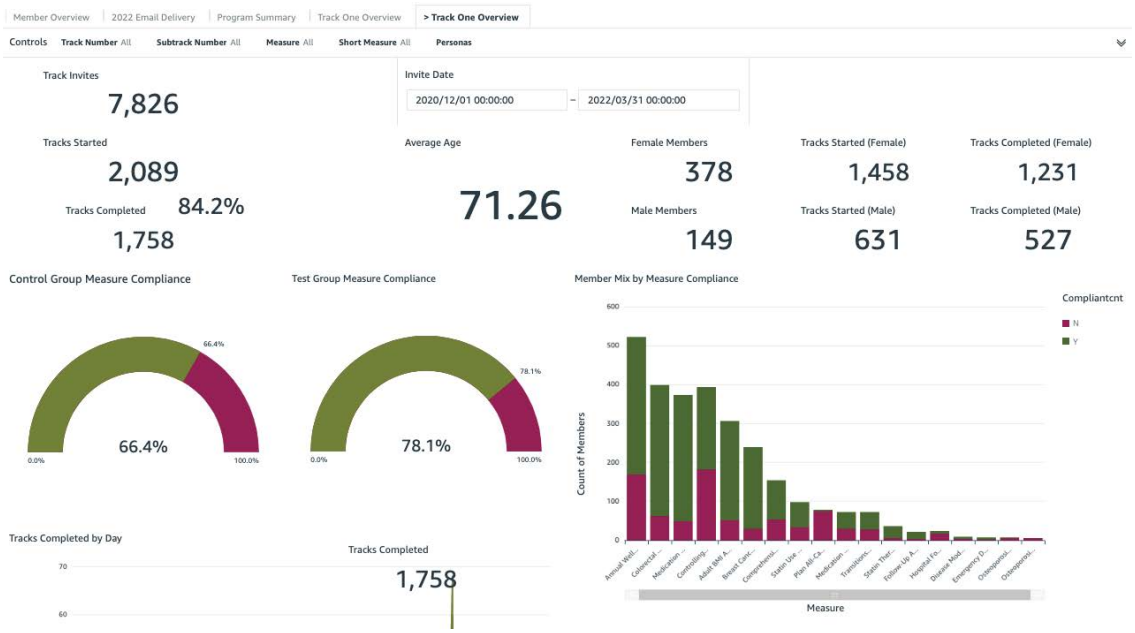
The above dashboard image shows an overview of the population of the data, focusing on compliance for a number of healthcare measures. All of the visuals are controlled by interactive filters which can help to focus in on different groups of people within your population.



The above dashboard image shows statistics centered around email delivery. This allows us to see detailed information regarding how many emails were sent, and how many were received and read, all trended by date.



The above dashboard image highlights patient's motivation and values data by cohort. This is the dataset collected through the card sorting game.



The above dashboard image shows statistics around the different communications and activities, indicating how successful each campaign was in closing gaps. Again each visual is controlled by interactive filters to help focus on specific data.