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Behavioral Adherence to Anti-aging Protocols: Comparing "Big Steps" versus "Baby Steps" in Lifestyle Interventions

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ABSTRACT

This study investigates health behavior adherence in adults over a five-week period, by comparing how effective gradual, smaller steps ("baby steps") are versus more immediate steps ("big steps") in lifestyle interventions. Eight participants logged their daily behaviors such as diet, exercise, and sleep, using a scoring system (+1 for positive behaviors, -1 for negative behaviors). The findings showed that consistent logging had a positive correlation with improvements, specifically the "big steps" participants, as they had more overall progress (e.g., better adherence to nutrient-rich foods and exercise). Some of the main challenges included cutting back on sugar and proper fiber intake, and some positives were good hydration and organized activities like exercise. This study highlights the importance of personalized and reliable tracking systems that ultimately lead to positive behavioral changes through proper consistency. These findings suggest that the combination of setting goals with appropriate feedback can improve health interventions for adults, but long-term sustainability in this field requires more research.

Introduction

Behavioral and health-related adherence of people appears to be a challenge in a specific field of study, behavioral science. This review incorporates findings from a five-week study that focuses on tracking the health and behavior of adults and using their habits to determine patterns and trends within their daily practices. Adults are utilized due to the general idea that some adults tend to have less motivation, and in some cases, a degree of physical limitations. The study scores people based on positive behaviors (+1) and negative behaviors (-1), with days that are not logged being excluded from the full analysis. Through the examination of these trends in adults and their health behaviors, factors can be exposed such as consistency in behavior, how

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stable one's routine is, possible influences, and how motivated one is to improve their lifestyle. The results that contribute to these many trends can cater towards determining proper health plans for adults, which ultimately support their quality of life.

Studies have shown that adherence to health behaviors in adults is influenced by many social, environmental, and cognitive factors. A review by Gast and Mathes (2019) found that the lack of adherence is a "multifactorial problem" that negatively affects the safety, efficiency, and the cost of therapies. Their review found that "higher education, employment, higher financial status and marriage/partnership mostly showed a positive effect on adherence," while "depression has a negative impact on adherence." The review also noted that "co-payments (any or higher) have a negative impact on adherence," and "adherence is lowest in very young and very old people." These notes and findings highlighted in the review demonstrate the idea that it is important to direct health interventions towards specific needs of specific populations, to cater towards the limitations of these specific populations.

Sauerberger and Funder (2017) mentioned that "behavioral consistency does not imply lack of situational adaptation." Through the progression of their study, they were able to bring across that "behaviors rated as relatively automatic showed more consistency," while "behaviors rated as relatively controlled showed more change." This variation supports the idea that health habits that are done simply through daily routines–like hydrating or taking morning walks–are more likely to be sustained than habits that require more intense decision-making, or an increased amount of effort. To elaborate, the use of slower progression rather than requiring immediate changes is more effective when discussing attempts to increase the amount of adherence in said populations.

Li et al. (2023) nationally analyzed health behavior trends in adults, and they reported that "the prevalence of never smoking increased from 49.4% to 57.7%," and "sufficient physical activity rose by 13.4%" between 1999 and 2020. However, they were also able to find that the "adherence to maintaining a healthy weight declined from 33.1% to 24.6%," and this was also found more in older adults. The results that were found through this study suggests that while some health behaviors are able to improve, other behaviors–ones that require an increased amount of sustained effort–end up remaining difficult for many adults to properly maintain. This helps to highlight the importance of focusing on habits that people are struggling with more intensely, providing extra support for those specific habits. Properly monitoring and tracking changes over time can also help determine which habits require frequent reminders.

Research on the method to structure goals in health behavior adherence shows a relationship between the use of smaller sub-goals (little steps) and larger, overall goals (big steps). Huang et al. (2017) highlight that sub-goals are effective in earlier stages of behavior changes because

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they can enhance how people perceive “goal attainability,” which makes the journey seem manageable and more motivating early on. However, as more progress is made by individuals, motivation starts to shift from the belief that the goal is achievable toward thinking more about how meaningful their actions are when discussing the larger goal. This suggests that the use of breaking down habits into smaller steps can help boost the beginning of adherence, as focusing on the broad purpose for the behaviors is important when thinking about long-term commitments.

Changing behaviors goes way farther than simply framing goals, like Michie et al. (2018) discuss in their review about behavior change techniques (BCTs). They mention that the identification of specific effective techniques is affected by the context, specifics of the behavior, and methodological limitations in the current approaches in research. Their findings suggest that neither focusing on only sub-goals nor exclusively focusing on big goals fully showcases the specifics of health behavior adherence. Instead, a way to effectively intervene requires an integration of both approaches, which caters towards a larger audience, as different strategies might work for different people at different stages. This understanding highlights the importance of flexibility when determining proper health behavior interventions.

Heino et al. (2021) emphasize that health behavior change is “complex and often nonlinear,” which suggests that it doesn’t follow a simple or predictable path for individuals. Many different factors affect behavior simultaneously, which makes it hard to predict using traditional methods that assume that things are separate and just simply add up. They suggest using “intensive longitudinal designs,” which means collecting data frequently over time to have a better understanding of how behavior changes. This approach supports tailoring these interventions to individuals as they evolve, specifically, how their motivations and circumstances evolve. This understanding brings across the idea that starting with smaller steps that are more manageable to build motivation, as Huang et al. mentioned, before moving towards larger goals, is a better solution than utilizing a fixed plan.

The primary goal of this study is to answer the following questions that may arise when discussing health habits in participants (adults):

- How consistently can participants maintain healthy habits over a five-week period?
- Do the participants seem to repeat positive/negative behaviors, or is there variation in their daily decisions?
- Do participants who log more often have better adherence than people who log inconsistently?
- Which positive habits are often maintained, and which are hard to maintain?
- Are there possible gender differences in how participants adhere to their health plan?

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- Do participants follow up their negative behaviors, or compensate, by performing more positive ones afterwards?
- Which habits are the easiest to target/change when considering programs to improve health for these participants?
- How could family members or caregivers use this study to provide more support to these adults?

Through the exploration of these inquiries, the study aims to expose insights into how adults tend to maintain healthy habits over time, or how they struggle with them. Understanding these various patterns helps to reveal which habits are sustainable, and which habits require more support to improve. As mentioned, these findings can help families, caregivers, and health professionals put together impactful strategies to better the quality of life and the well-being of aging populations.

Methodology

Participants

This study involved 8 individuals, who voluntarily agreed to take part in a multi-week lifestyle and dietary behavior experiment. To ensure consistency and comparability, participants followed a uniform data collection process, which included daily logging of food intake and adherence to either the "baby step" or "big" plan.

Diet Features

The objective was to examine the relationship between daily behaviors—diet, physical activity, and recovery habits—and overall lifestyle quality. Each participant followed one of two specialized plans: the Baby Steps Plan, which introduced small, gradual changes based on their baseline (or control week) data, and the Big Plan, which incorporated more significant, immediate shifts in behavior relative to that same baseline. These plans were developed using each participant’s control week data to identify specific habits in need of improvement. The Baby Steps Plan focused on making minimal adjustments, such as adding one healthy meal per day or walking an extra 10 minutes. In contrast, the Big Plan implemented larger jumps, such as replacing all processed meals with whole foods, meeting strict physical activity targets, or enforcing strict sleep routines. Both plans included shared behavioral goals—such as improved nutrition, consistent movement, and rest—but differed in the intensity and pace of implementation.

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Procedure

Participants adhered to the following steps over several weeks:

Plan Selection: Each participant either selected or was assigned to the Baby or Big Plan depending on their current lifestyle preferences and baseline lifestyle.

Daily Behavior Logging: Participants logged their actions and consumption each day using a structured format. The following behavioral categories were included:

Dietary Inputs: Processed meat, red meat, poultry, fish, fruits & vegetables, whole grains, refined grains, legumes

Fats & Additives: Saturated fat, trans fat, sugar, artificial sweeteners

Hydration: Water, alcohol, green tea

Substance Use: Alcohol units, cigarette count

Metabolic Habits: Calorie restriction, fasting

Physical Activity: Low/medium/high-intensity cardio, strength training, bone-density exercises, stretching, sauna

Recovery & Nutrition: Sleep duration, multivitamin intake, omega-3, collagen peptides, vitamin E, fiber, olive oil

Results

Each participant was assigned a net health score based on whether their behavior was positive, negative, or if the behavior on a given day was not logged at all. This data is presented in the table below:

Behavior Type	Condition	Score	Description
Positive Behavior	Behavior was done	1	Action was logged and performed
Positive Behavior	Behavior was not done	0	No activity recorded for that positive behavior
Negative Behavior	Behavior was done	-1	Action was logged and performed
Negative	Behavior was not	0	No negative behavior recorded

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Behavior	done		
Missing Data	No log for the day	Ignored	Day is excluded from average

The categorizations to whether a behavior was positive negative, or if there was missing data is described through the following; positive behavior was causing for a beneficial and positive lifestyle; negative behavior was where one's actions cause for a decline of their overall life; missing data meant that the participant did not log any data for that day. This data is presented below:

Behavior	Category
Fruits & Vegetables Servings Today?	Positive
Fish Servings Today?	Positive
Poultry Servings Today?	Positive
Whole Grains Servings Today?	Positive
Legumes Servings Today?	Positive
Water Intake (oz) Today?	Positive
Low Intensity Cardio (Minutes Today)?	Positive
Medium Intensity Cardio (Minutes Today)?	Positive
High Intensity Cardio (Minutes Today)?	Positive
Strength Training (Minutes Today)?	Positive
Bone Density Exercises (# Times Today)?	Positive
Sauna Frequency (# Times This Week)?	Positive
Sauna Duration (Minutes Per Session)?	Positive
Sleep Hours Last Night?	Positive
Did You Take a Multivitamin Today?	Positive
Vitamin E (mg) Today?	Positive
Collagen Peptides (g) Today?	Positive
Dietary Fiber (g) Today?	Positive
Fish Oil/Omega 3 (mg) Today?	Positive
Green Tea (oz) Today?	Positive

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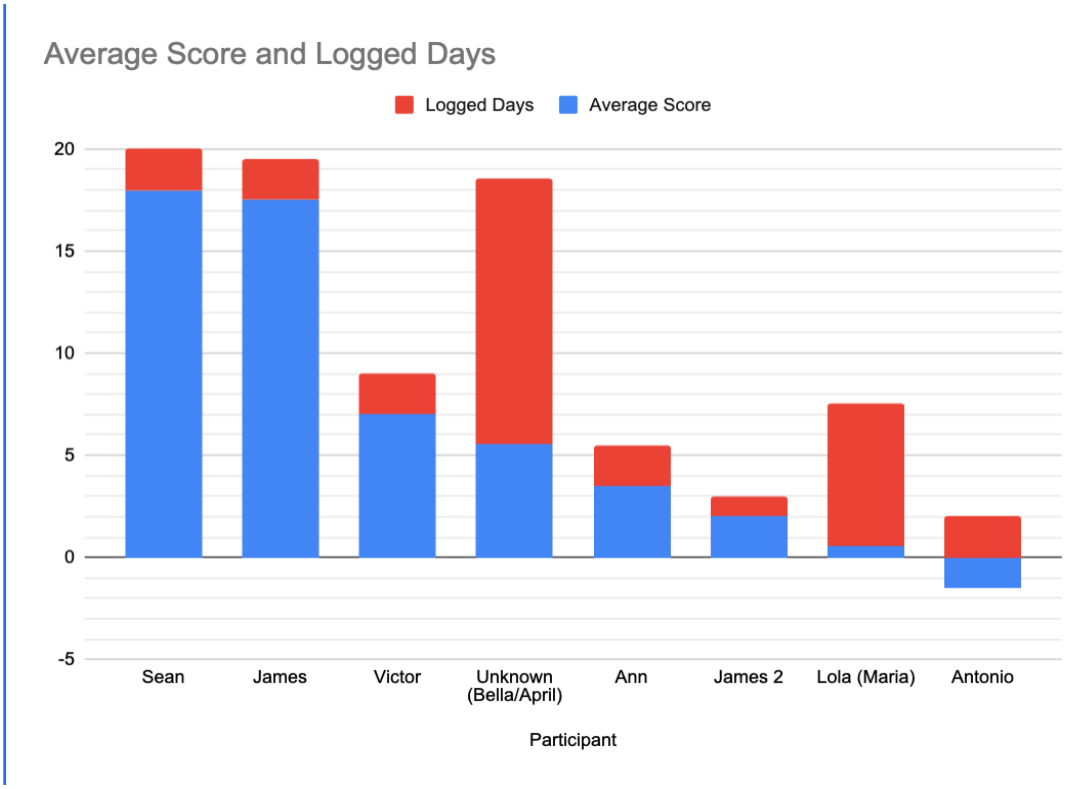
Olive Oil (g) Today?	Positive
Processed Meat Servings Today?	Negative
Red Meat Servings Today?	Negative
Refined Grains Servings Today?	Negative
Saturated Fat (g) Today?	Negative
Trans Fat (g) Today?	Negative
Sugar Intake (g) Today?	Negative
Alcohol Consumed Today	Negative
Alcohol Drinks Today	Negative
Cigarettes Consumed Today	Negative
Cigarettes Today	Negative

The following table provides an overview on the baseline data for each participant and the habits regarding logging their positive and/or negative behaviors:



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The scores above all follow the same order, the blue bar represents the average score of the participant, and from the top of the blue bar, the red bar above it begins at zero and accounts for the total logged days of the participant. The numerical data for each participant is listed here:

Baseline Data

Participant	Average Score	Logged Days
Sean	18	2
James	17.5	2
Victor	7	2
Unknown (Bella/April)	5.54	13
Ann	3.5	2
James 2	2	1
Lola (Maria)	0.57	7
Antonio	-1.5	2

Each participant's average score, represented in the graph and table above, is the baseline data that was used in comparison to the weeks 2-5 data at which time their true habits and lifestyle trends emerged. The results of weeks 2-5 indicate that there is no direct correlation to the amount of days logged and one's average score, but it seems that these baselines scores set very achievable improvement goals for each participant.

Conclusions on Baseline Data

Participant	Summary	Conclusion
James	Very high score, full tracking	Great habits, very consistent
Sean	Very high score, full tracking	Great habits, very consistent
Unknown (Bella/April)	High score, full tracking	Solid habits, very consistent
Ann	Medium score, full	Doing okay, habits should improve

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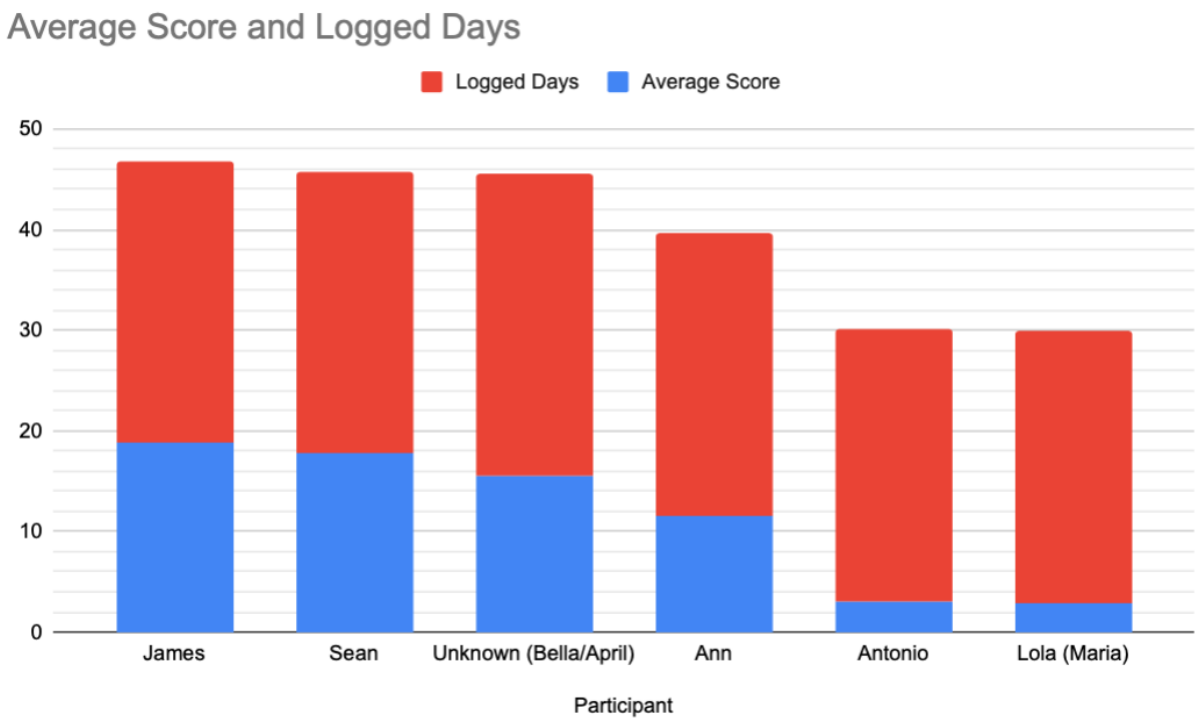
	tracking	
Antonio	Low score, full tracking	Needs to build healthier habits
Lola (Maria)	Very low score, full tracking	Logging consistently, poor habits

This group concluded that every participant aside from James and Sean have much room to improve in one or both of the areas of logging habits and/or committing themselves to go habits.



The graph depicts the logged day and average score of each participant of the Big Steps Data group. James logged his habits for 28 days, which led to his average score to be 18.75. Sean logged 28 days leading to his score of 17.75. The blue poll represents the average score for each participant, with the red poll building upon the blue poll to indicate the logged days' activity which was used to calculate the participant's scores respectively, as was the baseline data presented prior to this chart.

The numerical data for each participant for weeks 2-5 of the big steps data is listed here:

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Weeks 2-5 Data

Participant	Average Score	Logged Days
James	18.75	28
Sean	17.75	28
Unknown (Bella/April)	15.5	30
Ann	11.61	28
Antonio	3.04	27
Lola (Maria)	2.89	27

Here, the average scores for James, Sean, Bella/April, Ann, Antonio, and Lola are presented. In contrast to the baseline graph above, this graph presents the scores for each participant for weeks 2-5 of this experiment. When comparing the average score and days logged for each participant, it is revealed that consistently logging does not always equal a positive growth in building strong, consistent, good habits, as seen with Sean. Albeit it was only 0.25 of a score reduction, Sean's overall score dropped when he had to log his habits for multiple weeks, unlike the were two days of logged his baseline data was interpreted through. It is also clear that one can show significant growth in such a period of time, as Antonio did. With his average score jumping rising from a -1.5 to a 3.04, his commitment to building and maintaining good habits, while dropping and distancing himself from bad ones, has helped his overall quality of life to improve. And in a mere 27 he is feeling happier, healthier, and has recorded his life being better.

Whether a participant was consistently logging their data or not, trends start to emerge and correlations between health and life to habits can be inferred. This group recorded the trends in data for each participant for each week past the baseline week, and found genuine general and specific trends in lifestyle for each participant as shown below:

Individual Performance

Person	Net Health (W1 to W5)	Trend	Improvement	Notes
Ann	3.86 to 5.86	Steady increase	Yes	Weekly positive growth, no drops.
Antonio	1 to 0.71	Slight decline, then	No	Weak positives and high negatives.

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		low stability		
James	7 to 8.71	Quick increase, then stability	Yes	Consistent and increased well.
Lola (Maria)	1 to 1.14	Flat with a small bump at the end	Slightly	Slight change over the weeks, positively.
Sean	7.5 to 8	High and was consistent	Yes, stayed high	Maintained very good net health.
Unknown (Bella/April)	-0.5 to 2.14	Big turnaround, positively.	Big improvement	From negative health to solid improvement.

Specific Trends

Participant	Positive Improvements	Needs Improvement	Summary
Ann	More water, green tea, olive oil, fiber, vitamin E; less sugar (week 5)	High sugar in weeks 2–4	Good improvement over time
Antonio	More water, less alcohol	No fiber or olive oil, sugar increased weekly	Some progress, but key habits missing
James	Consistent olive oil, water, fiber, omega-3, strength (most weeks)	Strength dropped in week 3	Doing great overall
Sean	Very consistent, good olive oil, water, fiber	Small dips in strength	Very good consistency
Unknown (Bella/April)	Improved olive oil, fiber, strength, logging well	Sugar stayed moderate, some inconsistency	Making progress, can improve

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Lola (Maria)	More water, vitamin C	Very low fiber and olive oil, poor habits overall	Tracking well, major improvements needed

This group identified that each participant had an area which much improvement was needed, whether that was for the entire experiment or only for certain weeks, no one was perfect and everyone's health needs to continue to become better even after the conclusions of this experiment, but the positive habits these participants were able to build, and the negative habits they were able to break, it directly shown and the impact on their overall wellbeing is shown statistically and through first hand accounts.

For Ann, she struggled with consuming products that increased sugar levels in every week except the final week, week 5. It was shown that overtime she grew to replace the sugar drinks with more water and green tea, and that she replaced artificial oils with olive oil. She also provided her body with more vitamin E and fiber than prior to this experiment.

Antonio's improvement focused on trading out alcohol with water, but in doing so he sacrificed his fiber intake, compromised on oils and did not use healthy alternatives such as olive oil, and his sugar levels increase each week. Antonio made great progress on getting rid of his excess drinking, but he did not balance his transition to a healthy lifestyle, so as the liquid intake of his life became healthy, the nutrients his body needed were not provided.

James is overall a great participant who was very balanced and progressed very positively throughout weeks 2-5. He consistently used olive oil, drank water instead of an excess of alcohol, provided his body with the right amount of fiber and omega-3 nutrients, and improved on his strength. His only shortcoming was that his strength dropped in week 3, which could have been from anything from fatigue to a slight injury, to a lack of motivation. But overall James was a consistent and hard working participant who did what was asked and he definitely sees the results now.

Sean's results are almost identical to that of James' as he was very consistent and had a good intake of olive oil and water, and provided his body with the correct nutrients, most notably fiber. He also was dedicated to improving his strength and was consistently logging his daily habits, whether they were positive or negative. The only shortcoming Sean had, which was similar to that of James, was that his strength also took a slight dip periodically throughout his experiment, but this is more likely to be because he is only just now getting accustomed to strength training, and in the early stages of strength training one's strength fluctuates as one's strength is neutralized throughout the body.

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Bella/April was the stereotypical participant who did well, but could have been much more consistent when logging her habits, and she could have tried to benefit from a more rigorous strength training routine to further improve her strength while dropping her sugar in the progress. Overall, she did well, but being a more actively participating participant in this experiment would have led her to see more positive success in her lifestyle and overall well being.

Although Lola improves her water intake and provides her body with more vitamin C, she requires much improvement in the area of consistency, logging her habits, tracking her day to day routine, food, exercise, and lifestyle, and especially watching what she puts into her body. Lola would have seen much better improvement in every aspect of her life if she would have stayed consistent to her "small steps" and getting only a little bit better every day. Consistency was her biggest shortcoming and it is the reason why she did not improve her life as much as the other participants of this study.

General Trends

Trend	Explanation	Summary
Consistency	James and Sean stayed on track weekly	Being consistent helped to build and keep healthy habits
Small Steps	Ann made slow improvements	Small changes like more water and fiber led to more progress over time
Sugar	Many had trouble lowering sugar	Cutting sugar is hard and takes time it improved in later stages, in week 5
Missing Foods	Fiber and olive oil were often low	Some habits need planning, people forget what they aren't focusing on
Tracking	Best progress came from good logging	Tracking helped people stay aware and follow their goal
Takes Time	Week 5 showed the most improvement	Real changes don't show up right away most people took a while to improve

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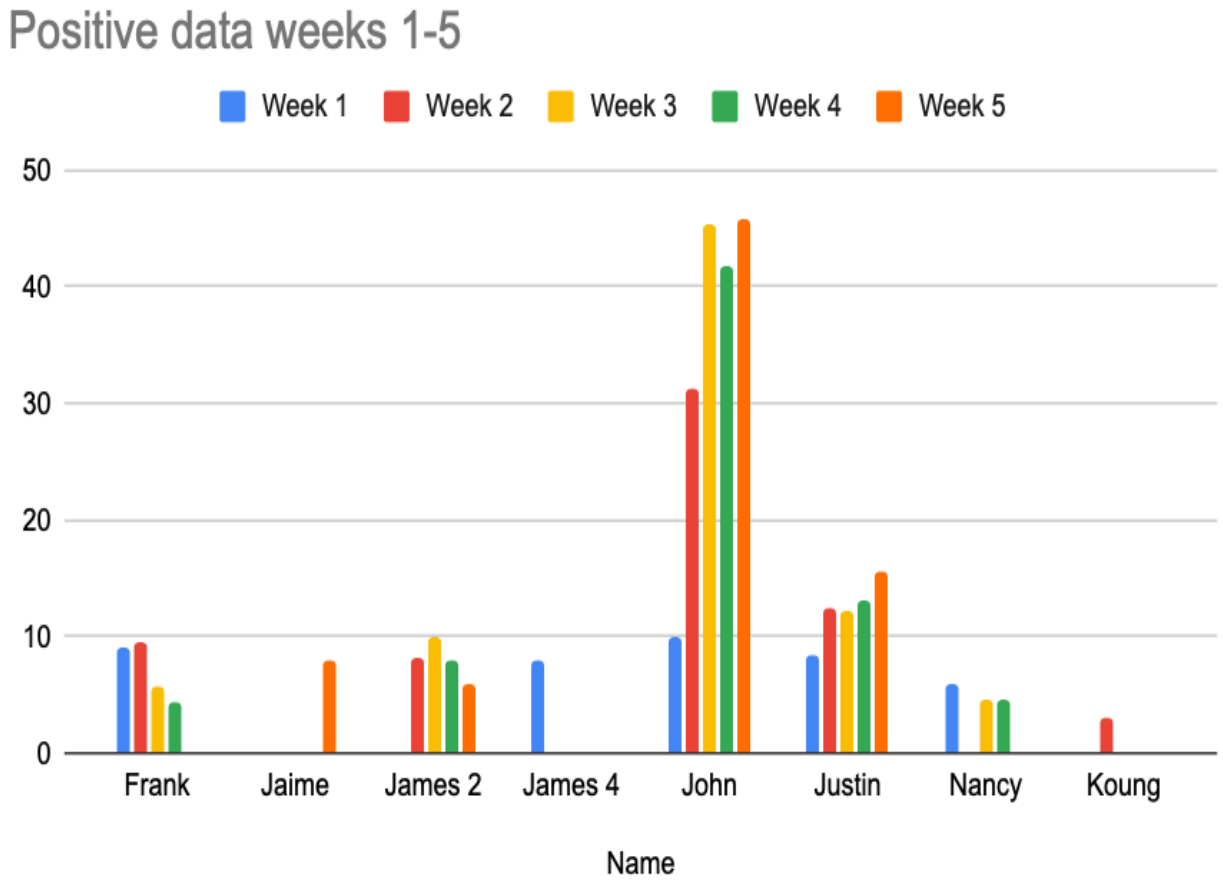
Generally every participant had similar results with each making slow improvements, having trouble with providing their body with one or more nutrient, and building consistently, but it was notable to add that most participants improved the most in week 5 as the consistent building upon small steps and building upon daily good habits leads to the overall wellness of life. To put it into simple terms, any participant who trusted the pillars of this study and stayed consistent, especially when their progress started to plateau, saw the most positive and most amount of growth when the end of the experiment came.



The chart above is indicative of the small steps experiment that was conducted to analyze "smaller" activities and how they built upon each other to influence and help one's lifestyle improve, which was also the goal of the big steps data this group analyzed above.

This chart shows the positive data, which is the healthy or improved things each participant did to improve their overall wellbeing. Obviously, some participants were not consistent with logging their positive activities, so trends will be harder to interpret, but most participants stayed true to the process and their results speak for themselves.

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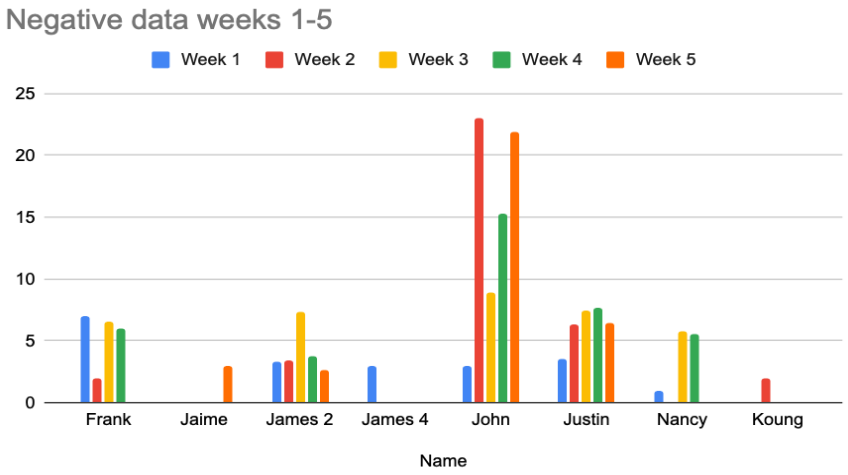
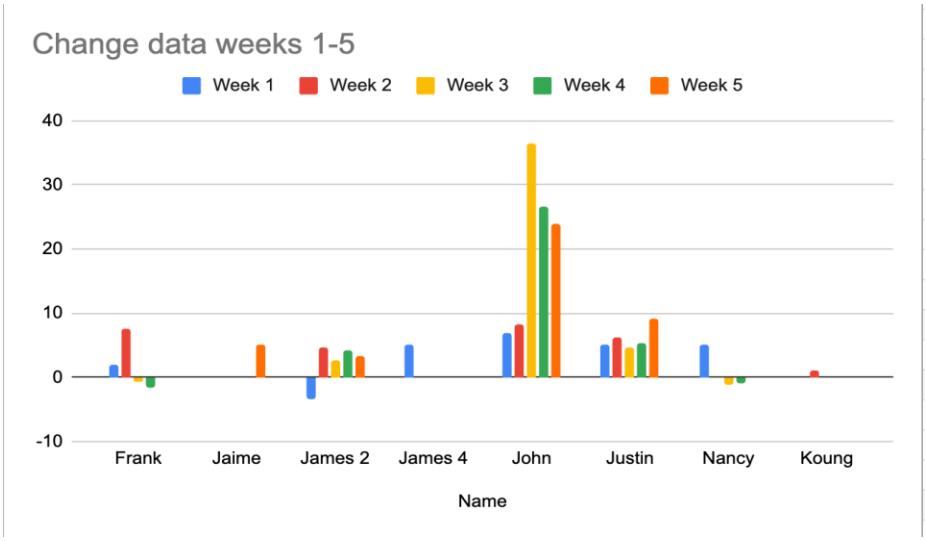


This chart presents the negative, or inhibitory, activities each participant did over the course of the 5 week data collection.

Note: Some participants' data does not have a complete 5 week data set, showing that there may be uncertainty in some participants from a lack of data.

With both the positive and negative data from weeks 1-5, it is clear there is almost a direct correlation to the amount of data logged and the amount of positive or negative growth each participant achieved. For example, John appears to have made many good habits throughout the 5 weeks, but he also logged an average of 14 negative activities per week, so it can be concluded that one can be committed to improve, and actually made the effort to improve, while continuing to commit to the bad habits and activities they were stuck in before.



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It is evident that the Big Steps experiment was a much more effective and overall beneficial procedure for each participant to see positive growth in their lifestyle than the small steps experiment. This is proven through analyzing the amount of times each participant logged their activities, whether it was good or bad. This Change Data chart presents the score of each of the small steps data participants, with the score being the difference between the amount of good activities and bad activities per week.

The change data from John immensely brings up the average score for the small steps data group as without John, using Frank, Jaime, James 2, James 4, Justin, Nancy, and Koung's data all have an overall change score of less than 10. On the other hand, the big steps data participants, aside from Antonio and Lola, all have scores above 10, with Antionio's score being 3.04 and Lola's score being 2.89.

It is also evident that the participants of the small steps data experiment were not as proactive and consistent with logging their progress. So, it can be concluded that it will be much more beneficial for any person to rely on taking bigger "steps", as in taking more significant improvements from one good activity to the next. Taking such small steps is too slow and causes one's progress to plateau instead of progressively overloading one's habits which promises positive growth.

Conclusion

This five-week behavioral adherence study provides valuable insight into how adult participants stick to, maintain, or struggle to stick to healthy habits over time. The study tracked both positive and negative health behaviors across diet and exercise, showing patterns in daily lifestyles and their impact on adherence and self-change.

Scoring System:

Each day's data was evaluated for positive behaviors (e.g., sufficient vegetable intake, physical activity) and negative behaviors (e.g., processed food, sugar, alcohol).

Score Total was calculated as:

$$\text{Positives} - \text{Negatives}$$

A Daily Average was then determined by dividing the score total by the number of behaviors logged.

This produced a Final Score per day, then averaged weekly to track trends over time.

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Key Takeaways

- Consistency is Crucial for Sustained Progress: Regular self-monitoring through daily logging is foundational for building awareness, accountability, and ultimately sustaining health behavioural changes.
- Holding oneself accountable to log both good and bad habits has shown to correspond directly with the amount of growth, whether that be breaking bad habits or building new good ones, a participant sees, which has lead many to crave a more visible positive improvements thus bringing them true motivation that separated the slacking from the hardworking and diligent participants
- Specific Habits Pose Unique Challenges: Certain behaviors, such as reducing sugar intake or increasing fiber and olive oil consumption, require more targeted interventions and focused support.
- Progress Takes Time and Persistence: Real behavioral change is not instantaneous, requiring sustained effort over several weeks and continued consistency, especially during perceived plateaus
- Logging consistency and Adherence are Directly Linked: A direct correlation exists between consistent data logging and the amount of positive behavioral growth, as tracking fosters self-awareness and informed decision making.

Optimization

As data accumulated, it was used to identify patterns and adjust each participant's plan as necessary. This enabled refinement of both the Baby and Big Plans toward optimal effectiveness for different individuals.

Future Directions:

To build upon the results and discoveries made, future research should branch out to several approaches. First, technological interventions, such as online tracking applications, health devices, and reminders to help stick to one’s diet, which can allow for consistent, engaged data tracking individuals. Gender specific studies may help show different adherence patterns and behavioral changes based on sex, allowing for more gender-targeted testing and interventions for participants based on gender. Longitudinal studies may help through providing longer term, more overall accurate data which monitors long-term sustainability, showing how habits can develop over time. Lastly, customized experiments based on specific habits–such as lowering cholesterol, increasing hydration, or improving fitness–can help create better, more change-orientated health programs for individuals.

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By addressing these areas, our understanding of behavioral adherence in adults can be refined for future studies, ultimately leading to more effective and personalized health interventions to improve quality of life.

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