



## Fitness motivations in United States Airmen

Patrick Howard<sup>1</sup>  
Joe Deutsch<sup>2</sup>

### Abstract

The increased consumer use of wearable fitness trackers which began in the early 2010s, has provided researchers with the opportunity to better understand human motivations for fitness. While physical fitness remains vital to health and is recognized as a predictor of long-term healthcare cost, it is crucial to better understand how to influence lasting changes in behavior and how those changes are associated with different motivation. The United States Air Force requires members to adhere to certain fitness standards as a means to measure mission readiness as well as in consideration of healthcare costs throughout an Airmen's career and into their retirement. Wearable fitness trackers offer an opportunity for the Air Force to increase physical fitness among Airmen by tailoring motivation tactics to fit their individual needs. This article will review the differing types of human motivation that drive fitness by examining them in relation to self-determination theory and exploring how wearable fitness trackers can be utilized in conjunction with this to improve fitness among Airmen.

**Keywords:** Extrinsic motivation; intrinsic motivation; wearable fitness trackers; United States Air Force; physical fitness assessment; self-determination theory.

### Introduction

The need to live a healthy lifestyle is important in the United States Air Force (USAF) for a variety of reasons. Maintaining physical fitness standards is part of the job when an Airmen join the USAF and upholding those standards as well as finding ways to motivate Airmen, remains a crucial part of being a leader. Motivating Airmen takes on the additional challenge because the method that is used to judge their fitness, the Physical Fitness Assessment (PFA), is only taken one or two times a year but the overall goal is to help them live a healthy and fit life year-round. The PFA is constructed of a cardio portion worth 60 points and two distinct muscular fitness categories worth 20 points each. The cardio may be accomplished via a 1.5-mile run or a 20-meter-High Aerobic Multi-Shuttle Run (HAMR). The muscular fitness is broken down into 1 minute of standard push-ups or 2 minutes of hand release push-ups, and 1 minute of sit-ups or 2 minutes of cross leg reverse crunches. The individual being tested must choose one event from each category to complete the PFA. There are minimum numbers in each component that must be met and the total for all equal be at least 75 points to achieve a passing score. If the airmen achieves a combined score of 90 or greater they are not required to complete the PFA again for 1 year, while a score of 75-89 requires an additional test

<sup>1</sup> Teacher M.S., North Dakota State University, HNES, [Patrick.Howard@ndsu.edu](mailto:Patrick.Howard@ndsu.edu)

<sup>2</sup> Professor Ph.D., North Dakota State University, HNES, [Joe.Deutsch@ndsu.edu](mailto:Joe.Deutsch@ndsu.edu)  Orcid ID: [0000-0003-3094-6641](https://orcid.org/0000-0003-3094-6641)



in 6 months, and below a 75 requires a retest (Air Force Manual 36-2905, 2021, 20). While the failure rate for Airmen remains around 15% (Pawlyk, 2017, 1), there is also a culture of “cramming for the test” and not remaining ready. Finding ways to motivate Airmen to lead a healthy lifestyle year-round remains a goal of the Air Force.

Research surrounding fitness motivation is not new, there has long been a search for how to best motivate people to live a more active lifestyle. Any study of fitness motivation must take into account that all people are motivated in different ways and there is no one size fits all approach. Using self-determination theory as a guide, much of the recent research has explored how the use of wearable fitness trackers (WFT) can create changes with lasting results (James, 2019, 287). The use of WFT has gained immense popularity in recent years with approximately one in every five American adults regularly wearing a fitness tracker (Vogels, 2020, 1). In response to a fitness motivation survey 50% of Airmen said they regularly utilize a WFT. This provides great opportunities to utilize the features of the WFT that most match their individual motivation style. The USAF utilizes bi-annual feedback between Airmen and supervisors to evaluate performance and establish goals. Using this already established Airmen and supervisor relationship the USAF has an opportunity to integrate the research into fitness motivation and the increase of WFT to positively impact Airmen fitness.

The importance of physical fitness is universally accepted but even with that being the case, only 57% of American adults are considered sufficiently physically active (Lynch, 2019, 418). Creating a program that will produce meaningful and long-term change in behavior requires an understanding of the varying types of human motivation. Research into Self-Determination Theory (SDT) establishes there are three primary states of motivation: Intrinsic motivation, extrinsic motivation, and amotivation. Intrinsic motivation is the motivation to do something because it is inherently interesting or enjoyable, the motivation is internal to the individual. Extrinsic motivation is the desire to do something because it leads to a separate outcome, this motivation comes from outside forces. Amotivation is the lack of motivation. An amotivated person does not feel an internal or external push to complete an activity. Organismic Integration theory (OIT) finds that all motivations to exercise fall along a spectrum that is a blend of all three states (James, 2019, 287). With the increased use of WFT and an understanding of human motivation, there is an opportunity to utilize commonly available WFT features to tailor motivation programs for individual Airmen.

The PFA is not only a measure of fitness in reference to ability to function in the military but also as a measure to keep healthcare costs down. Inactive adults have annual healthcare costs nearly 30% higher than active adults (Carson, 2014, 317). With more than 300,000 active-duty members of the USAF (Pawl, 2021, 1) and an undetermined number of retired Airmen, creating a healthy lifestyle is essential to a healthy fighting force and crucial to long term financial health of the Department of Defense. The USAF has a vested interest in creating an environment of fit lifestyles. It is crucial to target overall fitness as the more fit an individual is, the higher likelihood that they will succeed on their PFA. Studies into body composition and the PFA found that a higher BMI leads to worse results on the PFA (Pebley, 2019, 784). There has also been evidence presented that the increased use of fitness tracking devices and apps leads to increased physical activity (Brickwood, 2019, 6) which in turn leads to increased weight loss (Pourzanjani, 2016, 6). By combining the results of these studies, an increased use of WFTs will lead to increased scores on the PFA. The key as a supervisor becomes how to encourage the continued use of the WFT.

The emerging market for wearable fitness trackers (WFT) has created opportunities to further explore human motivations (Wright, 2017, 358). There are a wide variety of WFTs (Apple Watch, Garmin, Fitbit, etc) ranging from basic to highly advanced, and they all come with an associated app that is able to track steps, monitor and track sleep, utilize built in social features, create goals, etc. Using OIT, wearable fitness trackers and their associated apps, gives the greatest opportunity to create meaningful change in fitness. It is possible to utilize the various data sets commonly available via wearable fitness trackers to create individualized motivation plans. The data available on fitness trackers can be used to set goals via Exercise Control Features (ECF), interact with others and view their workouts and fitness stats via Social Interaction Features (SIF), and track progress and monitor

workout stats via Data Management Features (DMF). ECF are used to provide target goals for users to achieve. These goals included step totals, time spent engaging in activity that elevates the heart rate for a sustained period, and alerts to remind the wearer to move if they have been stationary for an extended period of time, etc. (James, 2019, 291) ECF are customizable for time and type based on user preferences. The SIF allows for others to see their workouts, have them posted into groups, or to other social media sites, and even create contests amongst peers (Zhu, 2017, 975). DMF logs a vast amount of previous user data depending on the device itself. This data can include steps, distance ran, workout details, water consumed, sleep, etc. Using a combination of these features allows highly tailored motivation.

### Methods

To better understand how this research may be applied in the USAF a survey was given to 100 Airmen. The Airmen came from across five Air Force Major Commands (MAJCOMS). The MAJCOM breakdown was 13 from Air Education and Training Command (AETC), 15 from Air Combat Command (ACC), 31 from Air Mobility Command (AMC), 11 from Air Force Special Operations Command (AFSOC) and 16 from United States Air Forces in Europe (USAFE). Of the participants in the survey 75 were male and 25 were female, which is near the overall Air Force average of 79.9% men and 20.1% women (Pawl, 2021, 1). Participants were asked to give their age within a set of ranges that matched how the PFA was scored. 28 of the participants were in the 18-24 age range, 38 in the 25-29 range, 18 in the 30-34 range, and 9 in the 35-39 range. Participants had an average time in the USAF of 7 years with a range of 1 year to 16 years. 15% of participants had previously failed a PFA. 50% had a current score that fell within the excellent range, 50% were passing, and no members had a failing score on their most recent PFA.

Outside of the demographic identifiers there were 12 statements regarding fitness habits and motivations. Participants were asked to score each statement on a scale of 1 through 7, with 1 being not true at all and 7 being very true.

To establish a baseline of how fitness is viewed in the USAF a response to the statement “I Believe Exercise is Important” was requested, with the average response being 6.21. This shows that despite any other habits Airmen have, they are aware that exercise is important in their role as Airmen.

To gauge fitness habits, six statements were surveyed on the same seven point scale. In response to “I exercise regularly (3 or more times a week)”, the average response was 5.83. In response to “I prefer to exercise alone” the average response was 4.77. In response to “I prefer to exercise with 1 to 2 other people” the average response was 4.17. In response to “I prefer to exercise in a group setting (3 or more other people)” the average response was 3.7. In response to “I follow a predetermined exercise routine” the average response was 4.04.

The portion of the survey regarding motivation posed six statements. In response to “I am motivated by the goals on my fitness tracking device” the mean response was 3.0. In response to “I am motivated to exercise to be healthy” the mean response was 4.71. In response to “I am motivated to exercise to pass the PFA” the mean response was 3.93. In response to “I am motivated to exercise to receive commanders’ incentives (day pass, etc)” the mean response was 2.32. In response to “I am motivated to exercise to improve the way I look” the mean response was 5.88.

### Discussion

The survey responses showed despite the PFA being a goal imposed on all Airmen by the USAF, it remains far from the primary motivating factor for fitness. The PFA can have an enormous impact on an Airmen’s career (Leonard, 2016, 1) but still does not motivate Airmen to exercise more. Using this knowledge to target SDT motivation as part of the supervisor/supervisee relationship, the USAF can create the culture of fitness that is the stated goal behind Airmen Fitness.

Those who fall more on the intrinsic side of the scale are motivated by pressures from within, they find their motivation from the satisfaction gained while doing an activity. Those who are intrinsically motivated have a need to be in control of their own fitness, this includes how they work

out and what their goals are. They do not benefit from the social pressures or automated prompts of the WFT or app (James, 2019, 293). The use of DMF to progress through workouts with no external forces guiding them, simply tracking progress is the most beneficial feature to an intrinsically motivated person. They remain in complete control of their progress and how they intend to get there, they are able to complete activities for the simple joy they find in the activity and track how that is impacting their fitness as an additional benefit.

Extrinsic motivation is when an individual is guided by external forces. These external forces can take many forms including social pressures and rewards or goals. The SCF and ECF available on WFTs can provide social pressures and external goals. These social pressures can come by way of challenges that have wearers pitted against their peers, a timeline of completed workouts visible to all members of the groups so members can see each other's' progress. The social pressure are achieved by seeing others working out and knowing there is a need to keep pace, or from being ashamed of not working out when others are. The goals are based in having more steps than others in a given period of time, running faster or longer, doing more weightlifting sets, climbing more flights of stairs, or other any other activities that are tracked. By posting workout stats into groups of peers there will be pressure to match production and not fall behind. Those with weight goals can also use the DMF to track their progress in both the short and long term (James, 2019, 294). The external goals may also be provided by the prompts the device gives to move if the wearer has been inactive for too long or in motivation to reach the daily steps goals etc. Having tangible rewards, that are achieved by reaching certain thresholds motivates those who need that external push.

Amotivation is having no driving internal or external force that push a person towards a goal, or being agnostic towards the goal. This would also describe a person who has no desire or drive to improve their fitness. An amotivated person very likely understands the need to improve their fitness but do not recognize a link between their actions and achieving that outcome. Those who are generally amotivated or those who are feeling amotivation for one reason or another may be motivated by the ECF and the prompts it gives to exercise. They may also be motivated by the SIF, as the involvement in a group of peers tracking their progress will allow for prompts from others to work out further, even when not motivated to do so. This provides the opportunity for accountability in lieu of motivation. The use of WFTs allows the continued motivation of someone who is generally amotivated by applying shifting strategies based on success rates. An amotivated person does not have one single path towards improving their fitness but the use of WFTs provides an opportunity to maximize their progress.

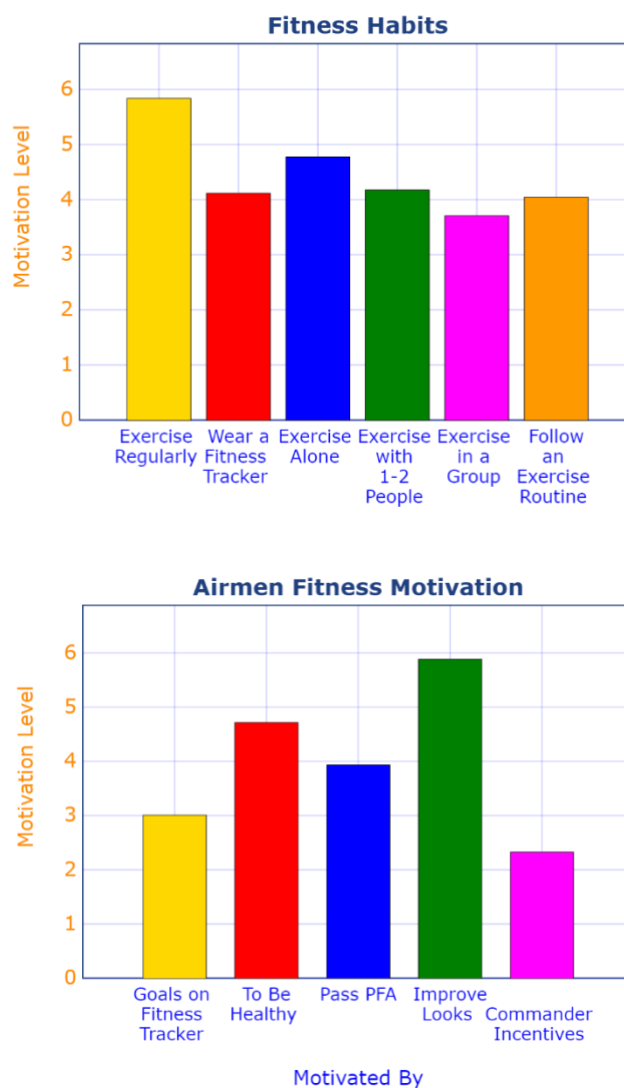
The best long-term results in regard to improving fitness behavior includes cognitive change and the best way to induce this cognitive change includes face to face feedback regarding fitness status (Lynch, 2019, 419). The USAF can utilize the already established and important supervisor to supervise relationships to create the ideal environment to encourage fitness. Supervisors have the opportunity to learn how their subordinates are motivated and help create an environment that best suits their needs. Understanding where their subordinates fall on the scale of motivation will require involved leadership, as will being tuned into their progress and using the right motivation techniques to keep them engaged. The ability to create a healthier and fit Air Force will be worth the additional effort and time.

This process has the opportunity to be formalized using Air Force Innovation funds which provide financial backing for projects that show the potential to improve the USAF at the squadron level (Alia-Novobilski, 2021). This program is used to identify projects that will potentially benefit the USAF. These projects are to be funded and operated at Squadron level; A USAF Squadron consists of anywhere from 30 to 500 personnel (Moran, 2006). To successfully motivate all Airmen these funds can be utilized to purchase WFTs for all members of a squadron and establish groups for both accountability and motivation. Due to the wide range of purchase price, an entire squadron could be outfitted with a WFT for \$5,000-\$15000, with a smaller reoccurring cost for member turnover. In each squadron the USAF employees a Unit Physical Fitness Monitor (UFPM) that is responsible for tracking PFAs within the unit. There are also Physical Fitness Leaders (PFL) who

assist in PFA administration and are responsible for running physical fitness training sessions throughout the squadron. Using a fitness app associated with the WFT, members would be placed in a mandatory group for accountability based on work section. Members would also be given the opportunity to join groups based on their identified fitness motivations, fitness levels, and fitness goals. Supervisors, UFPM, PTLs, and other appropriate personnel would be able to track fitness levels and workouts to assist in advancing Airmen fitness.

### Conclusion

Physical fitness is a critical aspect of being a successful member of the USAF and because of this it is essential to find the ways to motivate Airmen. The USAF has an opportunity to embrace fitness technology and self-determination theory to deploy customized motivation tactics and make lasting changes to behavior that work towards achieving the goal of not just passing PFAs, but living a healthy lifestyle. By incorporating WFT's and the understanding of varying motivations into the routine feedback that is required bi-annually, there is a chance to further personalize fitness levels into a situation where accountability is expected and embraced. This provides an opportunity to make meaningful change at lower levels of leadership utilizing WFT's and curated motivation tactics.



100 Airmen were asked to rank these statements on their fitness habits and fitness motivations on a scale of 1-7 with 7 being very true and 1 being not at all true.

### Resources

- Air Force Manual 36-2905*. Air Force E Publishing Forms Schools. (n.d.). Retrieved November 15, 2021, from <https://www.best-schools.info/air-force-e-publishing-forms/>.
- Alia-Novobilski, M. (2021, October). *Fiscal Year 21 drives innovation, Readiness Across Command, enterprise*. Air Force. Retrieved April 30, 2022, from <https://www.af.mil/News/Article-Display/Article/2808220/fiscal-year-21-drives-innovation-readiness-across-command-enterprise/>
- Brickwood, K.-J., Watson, G., O'Brien, J., & Williams, A. D. (2019). Consumer-based wearable activity trackers increase physical activity participation: Systematic review and meta-analysis. *JMIR MHealth and UHealth*, 7(4).  
View Article: <https://doi.org/10.2196/11819>
- Carson, S. A., Fulton, J. E., Pratt, M., Yang, Z., & Adams, E. K. (2014). Inadequate physical activity and health care expenditures in the United States. *Progress in Cardiovascular Diseases*, 57, 315-323.  
View Article: <https://doi.org/10.1016/j.pcad.2014.08.002>
- Leonard, A. (2016, October 16). *Four strikes and your Out*. > Air Force Reserve Command > Feature Article. Retrieved November 29, 2021, from <https://www.afrc.af.mil/News/Features/Display/Article/986848/four-strikes-and-youre-out/>.
- James, T. L., Wallace, L., & Deane, J. K. (2019). Using organismic integration theory to explore the associations between users' exercise motivations and fitness technology feature set use. *MIS Quarterly*, 43(1), 287-312.  
View Article: <https://doi.org/10.25300/misq/2019/14128>
- Lynch, C., Bird, S., Lythgo, N., & Selva-Raj, I. (2019). Changing the physical activity behavior of adults with fitness trackers: A systematic review and meta-analysis. *American Journal of Health Promotion*, 34(4), 418-430.  
View Article: <https://doi.org/10.1177/0890117119895204>
- Moran, M. (2006, October). Modern Military Force structures. Council on Foreign Relations. Retrieved from <https://www.cfr.org/background/modern-military-force-structures>
- Pawl (2021) *Air Force Demographics*. Air Force Personnel Center. (2021, October 31). Retrieved November 28, 2021, from <https://www.afpc.af.mil/About/Air-Force-Demographics/>.
- Pawlyk, O. (2017, August 8). *119 airmen failed the waist measurement test, and alternatives*. Military Times. Retrieved November 28, 2021, from <https://www.militarytimes.com/news/your-military/2014/09/12/119-airmen-failed-the-waist-measurement-test-and-alternatives/>.
- Pebbley, K., Beauvais, A., Gladney, L. A., Kocak, M., Klesges, R. C., Hare, M., Richey, P. A., Johnson, K. C., Hryshko-Mullen, A., Talcott, G. W., & Krukowski, R. A. (2019). Weight loss intervention impact on the physical fitness test scores of Air Force Service members. *Military Medicine*, 185(5-6).  
View Article: <https://doi.org/10.1093/milmed/usz371>
- Pourzanjani, A., Quisel, T., & Foschini, L. (2016). Adherent use of digital health trackers is associated with weight loss. *PLOS ONE*, 11(4).  
View Article: <https://doi.org/10.1371/journal.pone.0152504>
- Vogels, E. A. (2020, August 14). *About one-in-five Americans use a smart watch or fitness tracker*. Pew Research Center. Retrieved November 28, 2021, from <https://www.pewresearch.org/fact-tank/2020/01/09/about-one-in-five-americans-use-a-smart-watch-or-fitness-tracker/>.
- Wright, S. P., Hall Brown, T. S., Collier, S. R., & Sandberg, K. (2017). How consumer physical activity monitors could transform human physiology research. *American Journal of Physiology-Regulatory, Integrative and Comparative Physiology*, 312(3).  
View Article: <https://doi.org/10.1152/ajpregu.00349.2016>
- Zhu, Y., Dailey, S. L., Kreitzberg, D., & Bernhardt, J. (2017). “social Networkout”: Connecting social features of wearable fitness trackers with physical exercise. *Journal of Health Communication*, 22(12), 974-980.  
View Article: <https://doi.org/10.1080/10810730.2017.1382617>