WNDTP

by

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Introduction

Turns out, most of us aren't doing The Program [1]

Data drives science. Unfortunately, exercise science data are often weak and rarely long enough to truly display the adaptation the authors are trying to test. The Novice Training Logs on the Starting Strength Forums are an excellent and hitherto unused source of longitudinal observational self-reported data. It was just sitting there, looking smug, on the website, waiting for some ambitious students of strength to collect it. The Saint Vincent College Health and Fitness Club did just that and we learned a great deal in the process. We would like to report our results here [2].

There is good news and bad news. The bad news is that the vast majority of those who kept logs did not follow The Program and subsequently did not make the predicted progress. The good news is that if a lifter even moderately followed the prescription, the results were excellent.

Data

Student volunteers collected the weight progression of the four main lifts: the squat, press, bench press, and deadlift. We intentionally left power cleans out of the collection for a few reasons: not many people did them in the first place, those who did rarely followed any sort of progression, and most older trainees are proscribed from doing them anyway. It's unfortunate that so many who probably could do power cleans chose not to. This represents the first way that We're Not Doing The Program (which we shall henceforth abbreviate as WNDTP, to carry on the tradition). Since they cannot progress in the same way as the main lifts, chin-ups and any other accessory work were excluded from the study.

We recorded each work set weight with the number of reps performed in each set. A 135lb work set squat for 5, 4 and 3 reps was entered as "135,5,4,3" into our dataset. Only the heaviest weight per exercise per session was recorded. We only recorded the single work set of deadlifts, consistent with the Starting Strength novice program.

Students collected data from June 2015 until August 2015. They started at the end of the log pages where the oldest logs were kept and worked their way to the beginning. As of August 2015, there were approximately 1,200 unique entries organized by username in the Starting Strength Training Logs. Twelve volunteers (including the authors) were able to grind through most of the alphabet –

about 750 entries. [3] We were only interested in those using the Starting Strength novice program, so the other log sections (e.g., Intermediate) were ignored. There were two assigned data checkers who randomly selected entries to ensure data collected reflected actual logs.

We omitted any entrant who posted less than a week of data. We also disregarded entire logs when entrants did not use the four major lifts or substituted other lifts (e.g., sitting dumbbell presses for presses). We allowed for the following exception – the high-bar squat for some older lifters who were physically unable to squat correctly. We also discarded entrants who deviated so far from The Program's set and rep schemes that it no longer remotely resembled the Starting Strength novice program. For example, entries that consistently used sets of more than 5 reps (e.g., sets of 10) or pyramid sets or did not remotely follow the A-B workout schedule were deleted.

Once we discarded these entrants, our sample size was reduced to 402 observations. We also collected the following demographic data: sex, age, height, starting weight, starting body fat % (so rarely reported it was omitted from the analysis). Was this data collected and then later omitted? The overwhelming percent of trainees in the group was male (81%) with only 8% female and about 12% not reporting sex. The average training length was 14.7 weeks though women tended to stick with the program a little longer, on average, at 21.2 weeks. Please see Table 1 for a summary of the data.

Table 1: Summary Statistics

	Observations	Average Height (inches)	Average Weight (lbs)	Average Starting Squat	Average Ending Squat	Average Weeks Reporting
Total	402	70	190	171	247	14.7
Gender						
Male	324 (81%)	70	196	178	257	14.2
Female	31 (8%)	64	150	111	159	21.2
Age (Median)						
<29	151 (38%)		183	179	251	11.9
>=29	178 (44%)		198	163	242	16.5
Length of Treatment						
< 1 Month	85 (21%)		194	177	210	2.2
1 - 3 Months	174 (43%)		194	174	251	7.4
> 3 Months	143 (36%)		183	164	263	31.2

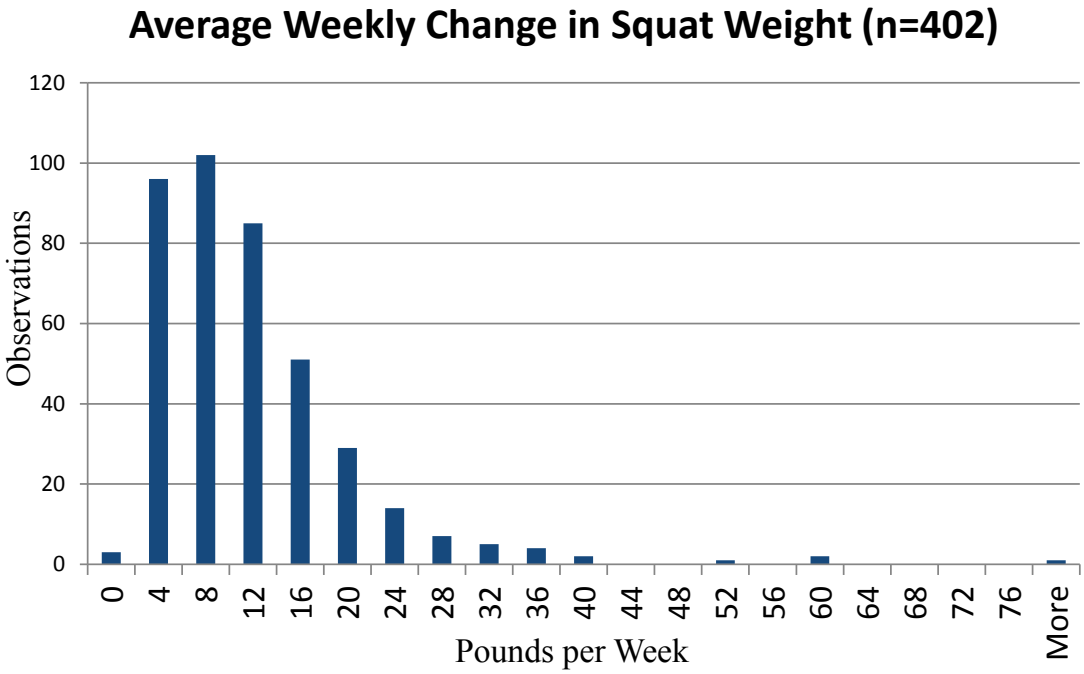
The data have significant limitations that we want to state upfront. It is observational data, not a controlled experiment. There is no control group. Those who report self-selected into the treatment. Thus we are not making predictions, merely observations, and even if we could, those predictions would not apply to the general population.

This is self-reported data. We have no idea if the squats were deep enough, if the presses were locked out at the top, or if the deadlifts were pulled from a dead stop for all reps. There is no way to verify the range of motion for the movements or the trainee's technique. Some trainees occasionally posted videos, but these videos represented one work set and were not posted with enough frequency to allow for any assumption of good form across all work sets.

Also, we presume, perhaps generously, that lifters measured their weights correctly and did not exaggerate the weight on the bar. Finally, many lifters may have continued to make progress but stopped reporting for any number of reasons. With these cautions in mind, let's proceed to the results.

Results

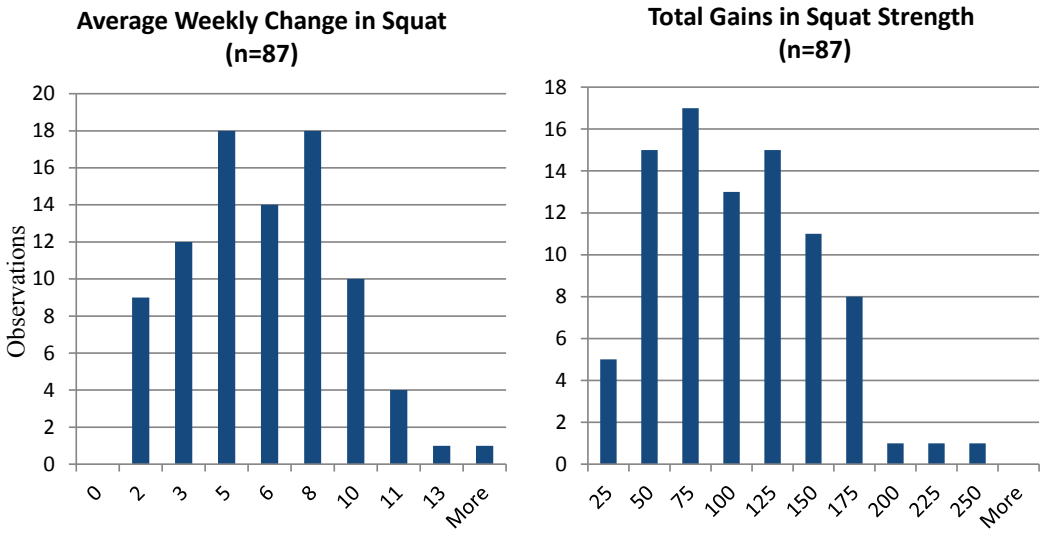
As Table 1 shows, better results occur if you are more male, if you are younger, and if you stick with the program longer. However, the full data (n=402) offer tepid results on each of the four lifts. We calculated average weekly change in each of the lifts from the first time the lift was completed. Figure 1 is the full distribution of the average weekly gains for squats for the full sample size. The results are generally disappointing with results significantly smaller than our expected idea of linear progression. There were a few odd outliers [4]. Note that this full set includes both males and females.



The data include entrants who logged for a very short time and the first step to better understanding the effect is to standardize the treatment length. To approximate a reasonable linear progression, we selected users who logged at least four months of training. We also eliminated females in this iteration. Our observations dropped to n=87. We censored the logs at four months so that we could see the gains of the average male at a single point. Figure 2 both as average weekly gains and total increases to the squat.

The average increase in squat weight during the four months was 5.4 lbs. The median lifter increased his squat by 90 lbs. This is significantly less than we have experienced here at Saint Vincent College and conversations with other Starting Strength Coaches seem to agree that this was lower than expected. Even though the results are fairly disappointing, it is still encouraging to note that the median user who logged his results for at least four months demonstrated a 50% increase in squat strength at the end of the treatment.

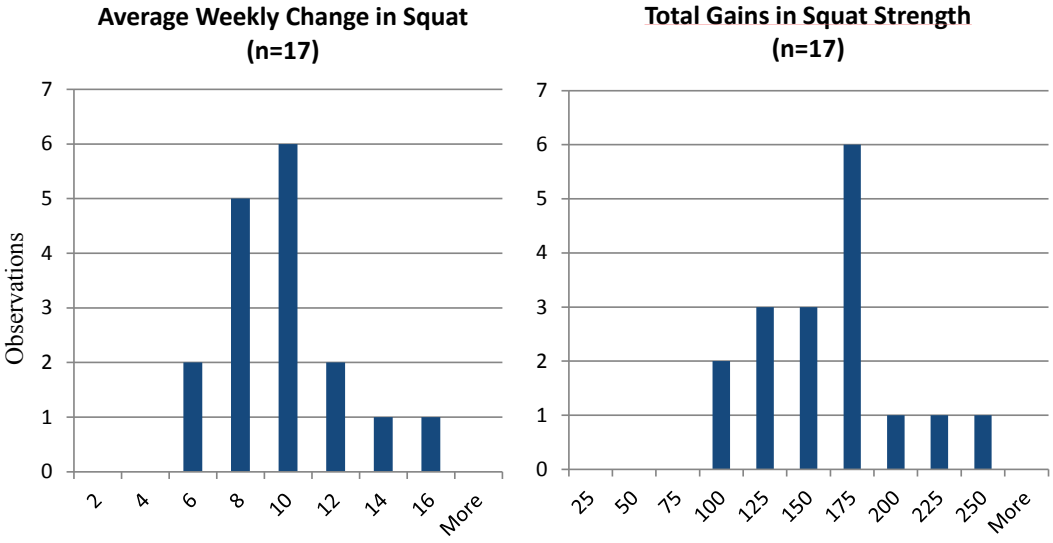
Figure 2: Squat Increases, Four Months of Training



The self-reported come from the Starting Strength training logs and as such there is a presumed intent to adhere to guidelines of The Program. The next step was to filter out those who may have logged data for four months but were not following the training prescription outlined by the Starting Strength linear progression. We added a few necessary conditions. In addition to recording at least four months of results, lifters here must have squatted an average of at least twice a week to signal at least vaguely following The Program (which we shall refer to as Kinda Did the Program or KDTP). They also must have started with 185 lbs. or less on the bar for the squat to signal a true(r??) novice.

We do not think that either additional assumption cherry picks the data since we are trying to observe what happens if a *novice* follows *The Program*. When we added what we perceived to be not terribly constricting assumptions, our sample size fell to 17. Only *5.2% of all males* squatted with at least *67% of the frequency recommended by The Program* and started out with less than 185 lbs. on the bar. This, itself, is a rather important discovery. The rest of the results are in Figure 3.

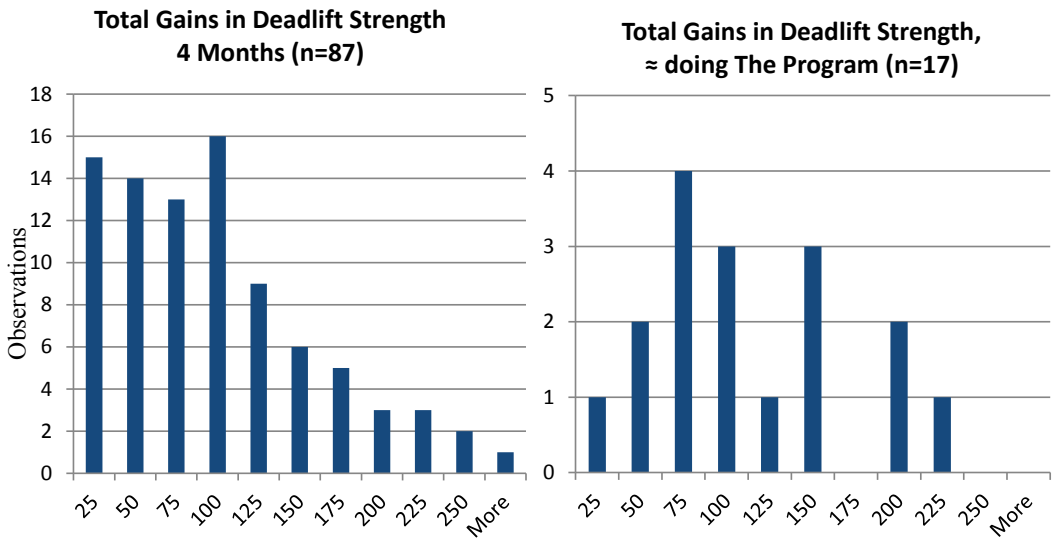
Figure 3: Squat Increases, ≈ Doing The Program



The average increase in squat weight during the four months for those sampled who KDTP was 8.8 lbs. The median lifter increased his squat by 154 lbs. which is a big step up from Figure 2. The modal increase in squat weight in this subgroup was between 150 and 175 lbs. over four months. The median user in this group demonstrated a 117% increase in squat strength by the end of four months.

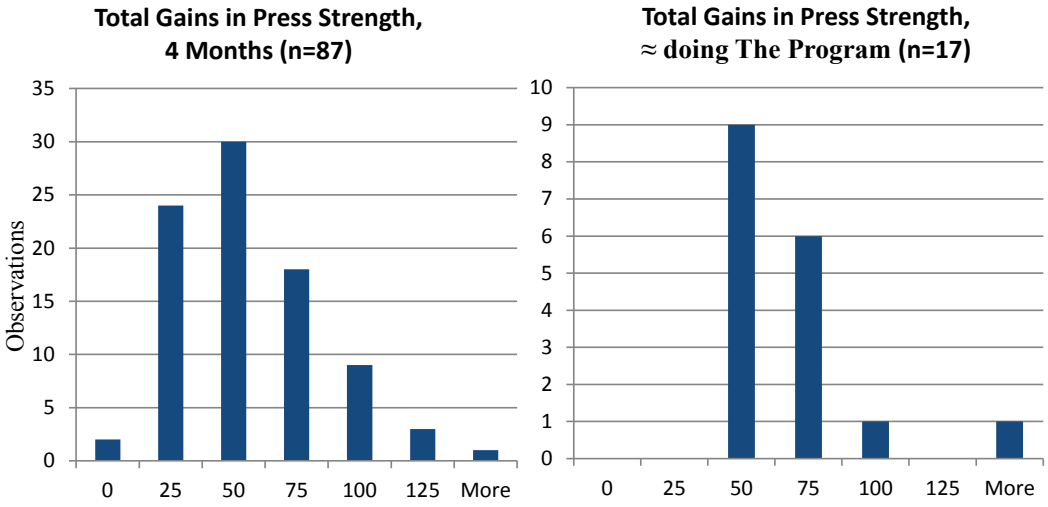
The deadlift produced similar results, shown in Figure 4. Those who logged at least four months of data earned an average weekly increase of 5.3 lbs. compared to 6.1 lbs. of the KDTP lifters. Median deadlift increases were 90 lbs. and 94 lbs., respectively. The Median percentage increase was 43% for the entire fourth month cohort and 62% for the smaller group. Given the 64 lbs. median gains differential between fourth month and KDTP squatters, these more modest deadlift results surprised us.

Figure 4: Deadlift Increases



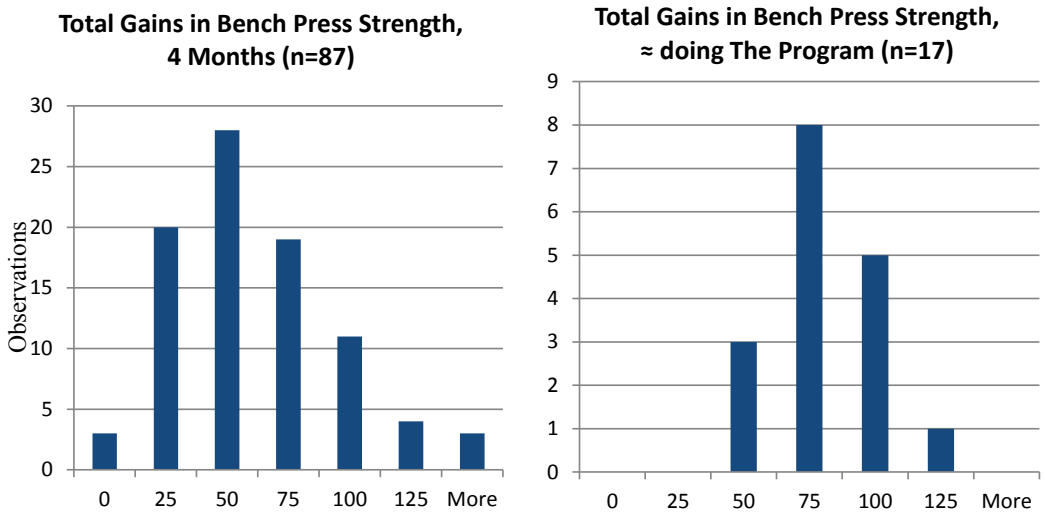
The press average weekly increases were 3.3 lbs. per week for those KDTP versus 2.7 lbs. for the broader four month cohort. KDTP earned the median trainer a 48 lb. increase in his press against 40 lbs. for the bigger group. This translates into a 74% median increase for trainees who KDTP while just sticking it out for four months earned the median trainee a 53% increase. Figure 5 shows the results.

Figure 5: Press Increases



We observed results for the bench press that were similar to the squat. Those lifters who KDTP generated 4.2 lb. average weekly increases while those who just stuck around for at least four months averaged 3.1 lbs. The median increase was 70 lbs. for those KDTP and 45 lbs. for the larger group. Figure 6 shows the results. The median increase over initial weight for KDTP trainees was 62% and for the fourth month cohort it was 32%.

Figure 6: Bench Press Increases



The primary observation that seems to be fairly clear is the following: The more a trainee adhered to The Program, the more strength the lifter gained. So what were the common reasons why lifters departed from The Program? We will take a look at these in the next section.

Observations

The data have very interesting and hopefully useful observations. Simply put, WNDTP. The driving force behind progress is taking advantage of the novice effect. Barbell training works by progressively overloading and recruiting the most muscle mass over the longest effective range of motion. Our primary observation is *not doing the program as written seems to hinder progress*. The few entrants who approximately followed The Program had results closer to what is predicted. The Saint Vincent College data hunters compared notes and found that most people made unnecessary changes to the program in a number of ways.

Length of Time on The Program

The recommended amount of time spent on the Starting Strength linear progression is 3-6 months. Genetically gifted people may be able to stretch this beyond 6 months. Only 36% of the entrants (n=143) kept up with their logs for at least three months. Of course we have no way of knowing whether the other 259 entrants continued training but just quit logging. That said, less than three months is almost always not enough time to complete true linear progression.

The length of time spent on the program is extremely important. Improved levels of strength are left on the table for those who do not commit to grinding through the 3-6 month period. A trainee who says he has graduated from novice progression in a short and sweet 8 weeks and moves on to the Texas Method sacrifices efficient gains in favor of slower progress.

Likewise, staying on the program too long becomes unsustainable as the trainee is no longer a novice and unable to recover by the next workout, possibly leading to frustration and disappointment. We discovered a few outliers who decided they were on The Program for a very long time (e.g., one entrant logged 107 weeks of training). Of course these lifters were not really doing The Program at all. We discovered that "SS for the Long Haul" users mostly stagnated for great periods of time and progress was essentially flat over long periods.

There were a few people who determined that they needed to run through linear progression a second time. While this is acceptable for regaining lost strength to bring them back up to speed, it is not a true novice linear progression. This is not an accurate representation of how the model works since their bodies have already adapted to training. These people typically had higher starting weights, and sustained large jumps in weight for a longer period of time compared to the untrained novice. Where we could identify these entrants, they were omitted from the analysis.

You're No Special Snowflake

There were a significant number of trainees who decided (usually through self-diagnosis) that they were the exception to the various rules of The Program. To avoid adaptable discomfort, they sacrificed better lifts for weaker ones. For example, we often read, in one form or another, the following: "I couldn't comfortably get into the low bar position, so I'm going to squat looking up with my wrists under the bar." Lifters would choose to start out with the Olympic (high-bar) squat "until their shoulders loosened up." Their shoulders never did seem to loosen up because most never switched to the (low-bar) squat.

Many lifters would use the front squat as an "appropriate" substitution. The vertical back angle, open hip angle, and closed knee angle of the front squat significantly removes the hamstrings from contributing to the lift. This makes the front squat a quad-dominant movement which places excessive strain on the knees due to the lack of balancing forces. The front squat is an accessory lift once a trainee's general strength has been developed. It should not be used as a primary lift.

We saw numerous substitutions for the bench press with dumbbells for no apparent reason. We know that there is no way to measure full range of motion on a dumbbell press, so the data become even less reliable. We know there is essentially no way to microload dumbbells once the weight begins to become heavy and smaller than 10lb jumps are necessary. Most lifters who substituted dumbbells for the bench press gave no reason.

Some people felt the need to substitute the sumo deadlift instead of the normal deadlift because, again they were either uncomfortable in the starting position, or did not want to accept the fact they had a lousy deadlift to begin with. We do not use the sumo deadlift (typically) because it shortens the range of motion by artificially shortening the legs. Kyle Mask discusses why this is not a good substitution for nearly everyone [5].

Artificially High Initial Squat Weight

In our sample, the average starting squat was 171 lbs. (178 lbs. for the males). Does this seem a little bit high? The personal experience of the Saint Vincent College Health and Fitness Club has found that most beginning (college age) males can squat between 95-115 lbs. to depth their first workout. Our Masters Athletes start with a significantly lower beginning squat. We can only conclude that this high initial weight on the bar comes from either unchecked egos, a misunderstanding of what "deep" means with respect to the squat, or that many of the novices running the program were not true novices.

Aside from not maintaining form, high starting weight on the bar puts novices prematurely closer to sticking points (just like taking too big a jump on weight increases). It is harder to get unstuck than to make small consistent jumps over time. Starting at a higher weight begs for this to happen. Typically entrants who started too high would have multiple resets or become frustrated or "graduate" prematurely to an intermediate program or a combination of the above. The great irony is that starting with a lower weight on the bar (say, 100 lbs.) may get you to a 405 lb. squat faster than starting at 178 lbs.

Stuck Too Quickly

The weight is going to get heavy. It is going to get heavy sooner rather than later, and that's okay – in fact, that's the point. It has been our experience that most novices love the first couple of weeks because nothing is truly heavy yet and progress is swift but not terribly difficult. By the second month, the grind begins. If the SVC Health and Fitness Club can keep a lifter committed through the second month of linear progression, that lifter will most likely be hooked on strength for life.

We found that many of the entries equated "difficult" with "intermediate." Most people who stalled and subsequently switched out of linear progression did not explicitly evaluate the standard sticking points: adequate rest between sets, adequate inter-workout recovery and correctly applied titration of weights.

Many of the entrants who stalled did not explicitly check the time spent between work sets. Trainees must understand that three minutes between work sets later in The Program is not correct. While the logs were full of discussion on how heavy the weight had become, rarely was time between sets mentioned or adjusted.

Often trainees who hit difficult lifts or stalled prematurely did mention lack of sleep and food as a potential cause. This is a good thing. However, what is not clear is if these trainees then correctly changed their sleep patterns or caloric intake over the long run. Some sought out the aid of Jordan Feigenbaum and the Nutrition Forum, and this helped.

Finally, many of the logs show a misunderstanding of the idea of titration of weights. Large jumps are going to be unsustainable in the long run, and The Program recognizes this. We call it linear progression, though it is more quasi-linear as the Law of Diminishing Marginal Returns necessarily slows progress (as it does for all things in life). Thus 5 lb. jumps on the press become impossible as the lifter moves through The Program. Unfortunately, it was rare that a lifter logged anything less than 5 lb. jumps on any of the lifts. Some of the entrants did use 1.25 lb. plates, but very few had anything smaller than that.

Excessive Warmups

The program is already designed to provide your body with sufficient preparation to lift heavy. Despite this, there are still plenty of entrants insisting on doing their own warm-ups with either a vigorous stretching routine or a cardio workout before lifting. The main problems are that static stretching isolates muscle groups in ways that they don't normally function, and anything more than brief cardio will begin to fatigue the body before the lifting has even started.

Two sets of five repetitions with the empty bar provide enough dynamic stretching to prepare your body for the lifts. It allows the motor pathways to be established so that the body knows exactly how it needs to move. The empty bar allows us to easily correct any issues with a trainee's form. It is always easier to correct an issue with 45 lbs. on your back compared to 315 lbs. We want the movement to be perfectly ingrained by the time the work set weights are on the bar.

The warm up sets after the empty bar should be spaced apart adequately so that the weight jumps are not large enough that they shock the trainee with too much weight. As the weight approaches the working sets, repetitions should be decreased so that the muscles are not fatigued for the Main Event. Many lifters failed to recognize these principles and pre-exhausted their bodies with excessive warmups.

Bastardization of the Program

Previously, we noted that many of the trainees felt they were the exception to the rule, and substitutions abound. We found a large portion of the trainees determined they were going to substitute lifts, add in additional lifts, or leave out lifts entirely. We are not sure why people felt it necessary to add their own changes; perhaps they thought it would improve their results. The Program, as written, develops the strength of the entire body and as we shall see shortly, the preponderance of evidence suggests that the closer a trainee sticks to The Program, the faster he will get strong.

The most common offense we saw was the substitution of lifts. We have already discussed the frequency with which entrants subbed in Sumo deadlifts for conventional deadlifts, dumbbell presses for the bench press, and the pick-your-variety-of-squat for The Squat.

The other two substitution culprits were additional arm and "core" work, because of the mistaken belief that The Program doesn't work abs or arms. Lots of bad stuff seems to follow when entrants added excessive accessory work. Curls, crunches and the like use very little muscle mass, but this accessory work pre-fatigues muscles that need to be fresh for the big lifts. Think about it this way – do you really want a tired abdominal wall when going for a new squat PR?

The unfortunate truth is that the only accessory exercise to be added, chin-ups, was often the very one that was forgotten. Rows abound, but often absent were those chin-ups. We understand why: they suck. They suck if you can't do them and they suck even more once you can. You get stronger and they still suck. They always suck. Nevertheless, they are there for many important reasons. So when doing The Program, get your chins in as soon as possible.

Some of the programming was also bastardized. Trainees changed the basic simplicity of Starting Strength by either changing the days of the workouts or changing the rep scheme. For example, two training sessions per week doesn't allow stress to be applied optimally to force adaptation (this logic does not apply, of course, to our Masters Athletes who will thrive on a two-day schedule). The novice trainee will be recovered and ready to train again somewhere between 48 and 72 hours after the stress (workout) has been completed. Thus, The Program recommends 3 training sessions per week. However, the data show that trainees squatted an average of 2.6 times per week (n=402). Those lifters who logged at least three months of data squatted an average of 1.6 times per week (n=143). We suspect this is less about intentionally changing The Program and more about letting the rest of life get in the way.

Changing the number of repetitions deviates from the effectiveness of the program. Five repetitions allow trainees to use heavy enough weight to force the body to adapt. We saw many novices using sets of eight to ten reps. This is no way to sustain The Program, due to the unnecessarily large amount of volume that high reps schemes gives you (not to mention the fact that form breaks down at these higher reps). Stalling inevitably followed, which will lead to frustration and claiming that "The Program doesn't work."

One last deviation we saw was people performing excessive work sets of deadlifts. Deadlifts get really heavy very quickly and are extremely taxing on the body. A single set of five produces enough stress to drive adaptation. We postulate that sets across on the deadlift resulted either from a misunderstanding the method or the mistaken belief that more volume was needed.

Conclusion and Next Steps

The training logs themselves contain a lot of useful information and some unanticipated discoveries. Even in the self-selected Starting Strength community, most of those trainees failed to follow The Program. Excuses, egos and substitutions hindered the average trainee from maximizing gains. The simplicity of The Program is much of the genius behind it; follow it and results are the reward, deviate to frustration. We hope that these observations can help trainees avoid some of the common traps displayed by the Starting Strength Training Logs.

Our next task will be to finish the self-reported data set and begin collecting more data. There is a wealth of older training logs that many Starting Strength Coaches have offered to let us look at and compile. We envision a collection of useful data that is tiered in its reliability. At the base is this (soon to be) completed self-reported data set. Older training logs collected at dedicated Starting Strength facilities represent the next step up in reliability. Finally, we hope the data we collect here will support the top tier Starting Strength Data Registry, which is standardized, collected and reported by Starting Strength Coaches. We believe this study demonstrates the need for better data but also the need for good coaching. It prompts one final question: if unsupervised, self-reported trainees who only moderately follow The Program average 8.8 lbs. of increases in squat strength per week, what would be the average gains realized by the average trainee under the guidance of a Starting Strength Coach?

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End Notes

1. Defined here as linear progression on the squat, deadlift, press, bench press and power cleans, taking advantage of the Novice Effect as efficiently as possible.

2. This paper reflects much of what was presented at the 4th Annual SSCAC in October, 2015.

3. Usernames that begin with the letters A-L, half of M, N, R, S and U were collected. Efforts are underway to collect the rest of the alphabet in the coming year.

4. For example, one entrant displayed an average increase of 80 lbs. per week. He had an initial squat of 135 lbs. and one week later squatted 215 lbs. He has four total entries. Either this was not a novice or those were the highest quarter squats ever recorded in the history of strength training.

5. Why (Almost) Nobody Should Pull Sumo by Kyle Mask