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Are We Done Yet?: A study of the effects of defined goals and progressive feedback on task performance and perceptions'

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Are We Done Yet?: A study of the effects of defined goals and progressive feedback on task performance and perceptions'

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ABSTRACT

For years, goals have been a focus of improving human performance, but with a variety of goals and performance metrics, determining sources of change and their effects on performance can be difficult to understand for application. Currently, goals are applied to nearly every task accomplished in industry or personal health, and this study attempts to pinpoint sources of improved performance measures based on goal definition and availability of feedback. Once dissected and identified this study will show what measures of performance can be optimized by an authority figure by manipulating goal definition and availability of feedback. This study approached the problem by giving a well-defined goal and a poorly defined goal to each participant, then compare groups whom were allowed to have progressive feedback vs those whom received no feedback. In summation, it was found that both goal definition and progress feedback had effects on performance, motivation and perceived exertion respectively.

CHAPTER 1: INTRODUCTION

The role of any manager, floor supervisor, or personal trainer position is to improve the performance of those working under them. The most commonly used tool to improve human performance without large changes to the actual design of the task is to apply a goal to the task. Examples could include number of parts produced per day, or even a personal record to beat. Research suggests when given a goal, people have more motivation (Locke, 1996), and with more motivation it's expected that people perform task-specific goals more effectively. Task specific goals are goals that are attributed to having a strong correlation between effort and performance. This increase in actual performance has research linked to the self-determination theory of motivation. The self-determination theory states how having a goal increases motivation to complete a task. More specifically, goals can enhance feelings of competence and intrinsic motivation (Vallerand, Edward, & Ryan, 2013).

Goals have been researched in a variety of ways, but this study will examine goals in two ways: 1) the initial definition of the goal, and 2) feedback on the progression of the goal. This study will prove how specific performance factors are affected by a goal's definition and/or the progress feedback given. A plethora of tools have been developed to define good goals, most popular is the use of the S.M.A.R.T. (Specific, Measureable, Achievable, Realisitic, and Time-Bound). Additionally, within the realm of human-computer interaction research has been done to define when progress feedback is useful and effective.

Progress feedback, or feedback on how much has shown to have mixed effects on performance. In a study by Couper (2001), there was no evidence to suggest that the presence of progress feedback helped with the completion rate of the task of online surveys. Conversely when progress feedback created a mismatch between actual progress and supplied feedback in which the progress bar showed less progress than the actual, in turn completion rates for surveys declined. This shows a decrease in actual performance, mostly in part because of the decrease in the perceived performance linking back

to the loss of competence in the task. Theoretically, people with a goal without progress feedback will complete a task similarly or worse than people who are given feedback. This argument seems revolves mostly around cognitive tasks, and is difficult to transfer to physical tasks.

CHAPTER 2: RELATED WORKS

Progress Feedback

Feedback can take many forms and has been studied in many ways from positive vs negative feedback and its effect on empathy and performance, but this study focusses more on progress feedback. Progress feedback can be displayed in many different ways, but most commonly progress bars. Progress bars have been study most aggressively completing surveys and other interactions between humans and computers.

One study examined the role of feedback on task performance. In which presence of progress feedback was changed when completing a survey. It was found that the completion rates of cognitive tasks remained unchanged whether a progress bar was present or not (Couper 2001).In a study by Yan (2010) it was found that feedback helps with completion rates of surveys when the surveys were short, but can reduce when survey completion rates for longer tasks or when feedback is slower than the actual completion. Similarly, Heerwegh and Loosveldt found evidence that suggests that presence of progress feedback does not help with the completion rates of online surveys and questionnaires.

Motivation

Task completion is also affected by how motivated people are to do the task, but there are many forms of motivation. In the self-determination theory of motivation, there are three types of motivation: extrinsic, intrinsic, and amotivation. The primary difference in each of these motivations is the source.

Extrinsic motivation is any type of motivation that comes from an outside source. One example would be when a boss or personal trainer presents a task. According to the self-determination theory, extrinsic motivation is further broken down into 4 subcategories external regulation, introjected

regulation, identified regulation and integrated regulation (Lonsdale, 2008). Extrinsic motivators run a spectrum from the fully external such as rewards to more internal extrinsic motivation such as feeling of personal importance, guilt or shame, or even internal rewards and punishments (Lonsdale, 2008).

Internalized motivations are very similar to intrinsic motivations both of which are solely internal motivators. Intrinsic motivation is when a task is completed out of the enjoyment one gets from doing the task (Ryan and Deci, 2000). Similarly, Ryan and Deci looked at different ways to change intrinsic motivation and found that giving positive or negative feedback would increase or decrease intrinsic motivation, respectively. Additionally, when extrinsic motivators are added to a person's previously intrinsically motivated task, the intrinsic motivation is severely undermined because of the behavior (Ryan and Deci, 2000).

Perceptions of Fatigue and Exertion

A company normally only cares about the results that their workers achieve, but their perceptions of work are a second consideration. Perceptions of work, such how hard people feel they are working or how tiring they find work, play an important role on the motivation to do the task as discussed earlier with the self-determination theory. These perceptions focus on feelings of self-worth and competence, leaving perceived fatigue and exertion undetermined.

Originally Borg developed a way to measure perceived exertion that correlates strongly to heart rate, this measurement tool became known as the Borg RPE (rated perceived exertion) scale (6-20). The Borg RPE scale is a scale that tracks the amount of effort an individual believes him or her is utilizing to continue/ finish a task. This scale has since been used to determine correlations between perceived exertion and actual performance. One study in particular by Currell and Jeukendrup in 2008, looked at the perceived effort of a 10 km cycling task with and without high-tempo music. The study concluded

that with high tempo music an average 2% improvement in performance was found (Currell and Jeukendrup, 2008).

Borg also created a method for measuring perceived fatigue, now known as the Borg RPF (rated perceived fatigue) scale. Similar to the Borg RPE the Borg RPF scale measures how tired or physically tried a person is from completing a specific task. One research study looked at the interaction of motivation and fatigue at varying levels and found that when persons were less motivated they also reported a higher amount of perceived fatigue. For the purpose of this experiment when a participant is in the "good goal" level they will exhibit both higher motivation and lower perceived fatigue

CHAPTER 3: METHODS

Objective

The purpose of this study was to determine how participants' collective performance (motivation, perceptions of task, and task achievement) change with goal definition and absence of feedback.

Hypothesis

Hypothesis 1: A well-defined goal will improve performance* of the task.

Hypothesis 2: Progress feedback being constantly updated and available will improve performance*.

*performance as measured by the five dependent variables

Participants

The participants for each experiment were volunteers from a 200 level Industrial Engineering course and other volunteers from around campus. In total 29 participants completed the first experiment and was comprised of 7 females and 22 males. The range of age for this groups was 19 to 35 with an average age of 23 years old. For the second experiment there were 13 participants with an average age of 22 and a range of 19 to 28 years.

All participants who completed the study met the minimum heath requirements for safe biking such as good cardiovascular health and joints. Also potential participants who were avid bikers were excluded from the study. Participants were randomly assigned to each group and were further randomized with a Latin square (for goal definition IV).

Task

Participants were tasked with biking on a stationary bike, on two separate occasions. For one visit participants were asked to "bike as hard as as they could **for two miles**" and another was to "bike as hard as they could **until asked to stop**".

Experiment Procedure

Participants arrived at the testing location and were immediately given an informed consent and briefing of the study. Next initial data was taken of the participants including resting heartrate, demographic data, and cycling motivation. Once data was taken participants were asked to perform an agility ladder drill (icky shuffle/ slalom/ cyclone shuffled) to baseline fatigue.

Upon finishing the first latter drill participants were instructed on how to interpret scales for motivation, Borg CP, and Borg RPE. Once orientated with the scales participants were asked to bike in one of two scenarios ("Bike until I say stop"/" Bike for two miles") on first visit then returning again 24 hours later to complete the second scenario.

During the task, participants were prompted every half mile traveled to report their motivation to continue biking, how tired they felt and how hard they believed themselves to be working. This continued until participants completed a distance of 2 miles at which they were asked to stop and complete the agility drills again. Once both scenarios were completed, participants were asked to complete a short survey about their experiences in the experiment (see page 22 for list of questions).

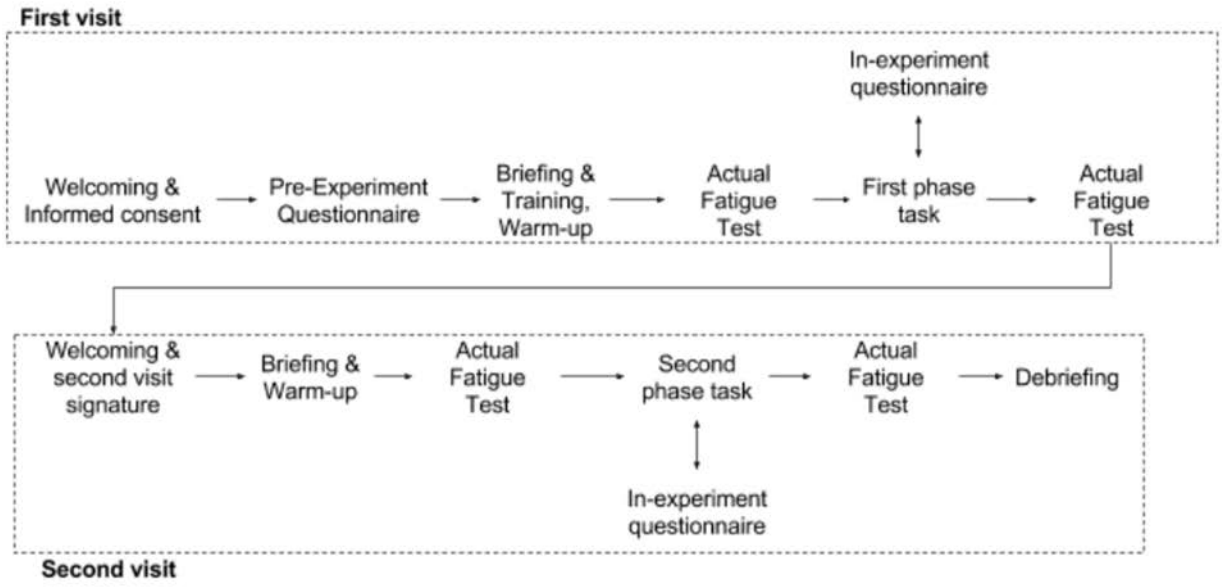

Figure 1: Experimental Procedure Flowchart

Independent Variables:

This study utilizes two independent variables the first being goal definition at two different levels one being a well-defined goal ("Bike as hard as you can for 2 miles") and the other being poorly defined and more ambiguous ("Bike as hard as you can until I say stop").

The second independent variable being manipulated in this study is the availability of progressive feedback. Similar to the first independent variable, feedback availability also has two levels. One level gives the participant continuous progressive feedback throughout the task allowing them to see how much of the task is left and draw conclusions about their pace during the task. The second takes the participants feedback on progression. The lack of feedback removes any indications of how fast participants are completing the task or how close they are to finishing it.

Dependent Variables

- *Perceived Exertion* was measured using the Borg RPE Scale from 6 to 20, six meaning no exertion and twenty meaning maximum exertion. At each half mile participants were queried about how hard they felt they were working to complete the task.
- *Perceived Fatigue* was measured using the Borg CP Scale from 0 to 10, zero meaning no fatigue and ten meaning maximum fatigue. At each half mile participants were queried about how tired they felt they were to complete the task.
- *Actual Exertion* was measured by using both speed and heart rate as participants biked. Speed was calculated by using the time stamps of each half mile increment. Heart rate was collected using a Fitbit Charge.
- *Actual Fatigue* was measured as time to complete agility ladder drill and the number of errors incurred during the drill. The foot pattern in question to complete the drill was a two feet in q foot out alternating sides of the "out foot" as the participant progressed through the ladder. The agility drill was done immediately before and after participant's completed each individual cycling task.
- *Level of Motivation* was measured on a scale from 0 to 10, zero meaning no motivation to continue biking and ten meaning no motivation to quit biking. At each half mile participants were queried about the amount of motivation they had to continue with the task of biking.

Table 1: Dependent Variables with metrics and units

Variable	Metric	Units	Data Type
Motivation	Subjective Rating	Self-Reported Likert Scale (0-10)	Quantitative
Actual Exertion (Total & Interval)	Speed	Feet per second	Quantitative
Actual Fatigue	Change in Time to complete (After-Before) Change in Errors (After-Before)	Seconds and Number of Errors	Quantitative
Perceived Exertion	Borg RPE Scale	Self-Reported Likert Scale (6-20)	Quantitative
Perceived Fatigue	Borg CP Scale	Self-Reported Likert Scales (0-10)	Quantitative
Open Ended survey Questions	NA	NA	Qualitative

Experimental Design

This study was done as a factorial design, using a within subjects to measure performance across goal and no goal. Additionally, for the within-subjects design, a Latin Square was applied to block for any effects that could have occurred between the two visits. Conversely feedback was examined as a between subjects design.

Data Analysis Plan

Data were analyzed using five independent two-way ANOVA tests, one for each dependent variable. Average speed for the two mile interval will be calculated and compared in a mixed-model full factorial two-way ANOVA test. Averages of perceived fatigue, perceived exertion, and motivation that were collected throughout the experiment were calculated and compared using a mixed- model full

factorial two-way test. Lastly actual fatigue takes the average time and errors from two agility ladder drills before each task and calculates the difference from two cycles of the same drill after the task. This number shows the fatigue created by the experiment. Next, the difference between the tasks was calculated (i.e. $Fatigue_{goal}$-$Fatigue_{No\ Goal}$) and compared using a within subjects t-test followed by a one-way ANOVA test for feedback.

Once finished all significant findings were further analyzed using both Tukey's HSD post hoc test and Least Square Means Estimates to determine directionality. Additionally effect size and Cohen's D were calculated to show effective differences between samples.

Testing Environment

The study was completed using a stationary bike, in a sterile lab setting. The bicycle displayed the distance, time, and resistance were shown to one group and we blocked in the other group. Additionally, a Fitbit Charge was placed on the wrist of the participant to track heart rate.

Limitations and Assumptions

While this study addresses some of the larger limitations from an earlier study, but still is limited in some of its dependent variables. Initially it was expected that the chosen agility drill on a 12 ft. agility ladder would be enough to find significance in errors or time to complete. While a good method, it would be recommended to utilize a more complex drill or a longer ladder to aid in finding and effective fatigue. Similar to the agility ladder, while a Fitbit is an easy to use tool to collect heart rate. The Fitbit also lacked the expected sensitivity, sometimes needing to extrapolate over 15-60 second intervals which skewed the data. Lastly it was assumed that no participant, engaged in any activity outside, their daily routine that could have skewed the data one way or another.

CHAPTER 4: RESULTS

Quantitative Summary

Performance of this cycling task was measured across 5 metrics: motivation, actual exertion, actual fatigue, perceived exertion, and perceived exertion. In hypothesis one, it was suspected that regardless of feedback that performance would increase when participants were given a goal. This hypothesis was partially proven true, due to an increase in motivation. When participants are given a defined end goal ("bike as hard as you can for 2 miles") there was no evidence to suggest that they actually completed the task more quickly. Similarly, when perceptions of the task were examined the goal did not perceive themselves as working harder of feeling more fatigued throughout the task.

Conversely self-reported motivation did prove to be effected as the definition of the goal changed. Tukey's HSD post hoc test and the Least Square Means Estimates we see that a well-defined goal increases motivation. This follows what is found in the literature that when a goal is present people feel more motivated because they have something towards which they are working. This study found that a well-defined goal increased motivation by just over .15 points on a 10 point scale (table 16). This may not seem like much only being a 1.7% difference it also shows a Cohen's D of .34 meaning it's a difference between the two groups, which not only is significant but is also applicable. Another important note is that with increased motivation there was no evidence to suggest an increase in speed or decrease in perceived fatigue which was found in the literature.

The second hypothesis stated that performance would increase when feedback was given to participants. With feedback it was expected that participants would have greater motivation as they gained competence in completing the task, the data does not support such a relationship. Additionally

feedback does not show any evidence to suggest increased actual exertion or decrease in fatigue of either kind (actual or perceived).

The data do support that perceived exertion is significant, showing that the absence of feedback is linked to higher reports of perceived exertion. The effective difference between having progressive feedback and the lack of perceived exertion was calculated to be just under .25 on a scale from 6-20. Additionally with a Cohen's D approaching .5, this effect size difference is small, bordering on moderate difference between a group, meaning it will show a larger change over a shorter interval.

Qualitative Data Summary

Once both tasks were completed a short survey was given to participants to allow them to share any insights about the experiment they wished to share. From these surveys (40) interesting trends emerged, for both the "feedback" and "no feedback" participants seemed to agree that the "poorly defined goal" level of Goal definition IV was more difficult to complete and left them feeling more tired. Additionally, for the feedback group, it appeared that the people who thought the well-defined goal was harder than the "No goal" were outnumbered two to one. The participants for the "No feedback" group were split more 50-50 with only a few more stating that the "poorly defined goal" was more difficult.

Participants also shared which task they felt made them work harder. This was actually a change across the Goal definition IV for many for the question about which task made them feel the most tired. A majority of participants said that they worked harder when they had a "well defined goal", rather than in the "poorly defined goal" where they felt more tired. This highlights the lack of correlation between perceived exertion and perceived fatigue.

Perceived Exertion

Table 2: Perceived Exertion Two-Way ANOVA Test

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	3	190	63	6.2097
Error	395	4020	10	**Prob > F**
C. Total	398	4210		0.0004*

Table 3: Perceived Exertion Main Effect Tests

Independent Variables	Nparm	DF	Sum of Squares	F Ratio	Prob > F
Goal Definition	1	1	0.46	0.05	0.8312
Available Feedback	1	1	190	19	<.0001*
Goal Definition *Available Feedback	1	1	0.00	0.0000	0.9972

Table 4: Perceived Exertion Least Squares Means Estimates

Available Feedback	Estimate	Std Error	DF	Lower 95%	Upper 95%
Feedback	13	0.19	395	12.77	13.53
No Feedback	14.6	0.28	395	14.06	15.17

Table 5: Tukey's HSD Pairwise Comparison for Perceived Exertion

Available Feedback		Difference	Std Error	t Ratio	Prob>|t|	Lower 95%	Upper 95%
Feedback	- No Feedback	-1.47	0.34	-4.31	<.0001*	-2.14374	-0.800828

Perceived Fatigue

Table 6: Perceived Fatigue Two-Way ANOVA Test

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	3	5	1.76	0.2579
Error	396	2710	6.84	**Prob > F**
C. Total	399	2715		0.8557

Table 7: Perceived Fatigue Main Effects Test

Independent Variable	Nparm	DF	Sum of Squares	F Ratio	Prob > F
Goal Definition	1	1	0.806	0.118	0.7315
Available Feedback	1	1	2.16	0.316	0.5746
Goal Definition*Available Feedback	1	1	1.241	0.182	0.6703

Actual Exertion

Table 8: Actual Exertion Two-Way ANOVA Test

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	3	13	4.34	0.2471
Error	73	1283	17.58	**Prob > F**
C. Total	76	1296		0.8631

Table 9: Actual Exertion Main Effect Test

Independent Variable	Nparm	DF	Sum of Squares	F Ratio	Prob > F
Goal Definition	1	1	1.88	0.1067	0.7449
Available Feedback	1	1	0.143	0.0081	0.9285
Goal Definition *Available Feedback	1	1	6.04	0.3436	0.5595

Actual Fatigue

Table 10: Actual Fatigue Two-Way ANOVA Test

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	3	3	0.919	0.6303
Error	72	105	1.46	**Prob > F**
C. Total	75	108		0.5978

Table 11: Actual Fatigue Main Effect Test

Independent Variables	Nparm	DF	Sum of Squares	F Ratio	Prob > F
Goal Definition	1	1	0.591	0.4054	0.5264
Available Feedback	1	1	0.577	0.3960	0.5311
Goal Definition*Available Feedback	1	1	0.897	0.6156	0.4352

Motivation

Table 12: Motivation Two-Way ANOVA Test

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	3	106	35.3349	4.4959
Error	396	3112	7.8594	**Prob > F**
C. Total	399	3218		0.0041*

Table 13: Motivation Main Effects Test

Independent Variable	Nparm	DF	Sum of Squares	F Ratio	Prob > F
Goal Definition	1	1	73.0	9.2916	0.0025*
Available Feedback	1	1	0.489	0.0622	0.8032
Goal Definition *Available Feedback	1	1	5.52	0.7018	0.4027

Table 14: Motivation Least Squares Means Estimates

Goal Definition	Estimate	Std Error	DF	Lower 95%	Upper 95%
Goal	5.53	0.211	396	5.12	5.95
No Goal	4.62	0.212	396	4.21	5.04

Table 15: Tukey's HSD Pairwise Comparison for Motivation

	Goal Definition	Difference	Std Error	t Ratio	Prob>|t|	Lower 95%	Upper 95%
Goal	No Goal	0.912	0.299	3.05	0.0025*	0.324	1.50

Post Hoc

Table 16: Cohen's D and Effect Size

Dependent Variable	Main Effect Factor	Effect Size	Cohen's D	Interpretation
Motivation	Goal Definition	0.172	0.349	Small
Perceived Exertion	Available Feedback	0.231	0.475	Small to Moderate

CHAPTER 5:DISCUSSION

The evidence suggests that neither feedback nor having a goal increases actual exertion. Similarly there is no indication that goal definition or availability of feedback decreases actual fatigue or perceived fatigue. The lack of change of actual exertion likely comes from the definition of the goal which was to "bike as hard as you can……". If participants truly completed what was requested, there should not be a significant difference between the groups. Actual fatigue likely did not show any difference due to the agility drill and/or duration was not sensitive enough to find the fatigue that existed.

The availability of feedback suggest that feedback lessens the amount of perceived effort that people feel they are putting forth. Historically it was believed that when people were motivated they would try harder and increase their effort, but this study does not support this belief. Instead the evidence supports that when participants can see their performance they tend to recognize when performance drops. This may give a limiting factor to their self-reported exertion. When feedback was given participants began to feel the anaerobic burn as muscles became fatigued or tired, and this required more conscience effort to overcome and maintain a pace. As the task continued they could see the decrease in speed which would act to counter balance this increased effort due to fatigue. When feedback ceased, participants cannot see what their pace or speed is, then this takes away from the guilt of going slower on perceived exertion, and in turn they only realize the conscience effort it takes to overcome the fatigue. This is why when feedback is absent there appears to be an increase in perceived exertion.

It appears that a well-defined goal increases motivation, in line with the self-determination theory of motivation. The increase in motivation though did not support the idea that increase motivation decreases perceived fatigue. This is in part that in this task, a more aerobic/anaerobic

definition of fatigue was used rather than the sensation of feeling sleepy where a correlation was found (Ahsberg & Gamberale, 1998).

CHAPTER 6: CONCLUSION

When designing work it is apparent that simply applying a goal to a task will not improve a worker or athlete's performance, instead progress feedback is also required to increase performance. Upon the evidence shown here, it would be recommended that every coach before a game or two days before a game for conditioning never give them feedback on how long they will spend conditioning. Many coaches say that this method makes the athletes "mentally tough", but also scientifically it is a good practice.

In agreeance with making the athletes toughen up mentally by making them push themselves for each additional exercise without knowing the end. They perceive themselves as working harder without causing additional fatigue to their muscles. This in theory would push the athletes farther in their perceived exertion, without increasing actual exertion. Since theoretically there is less actual exertion to get athletes game ready, they should have a shorter recovery time to have fresh legs for the upcoming game.

CHAPTER 7: FUTURE WORK

Although, this study was limited, there were interesting significant findings. It would be interesting to see how these findings transfer from the theoretical working world to the actual working world. Similarly, this study had a fairly short duration (roughly 10-min/visit) to accommodate a student's busy schedule, which could amount to the small effect sizes. One area of future work would be to increase the duration of the experiment to see if the effects scale (i.e. what happens when participants bike for 4 miles or 30 minutes).

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APPENDIX A POST EXPERIMENT SURVEY QUESTIONS

Table 17: Post Experiment Survey Questions

Questions	
1.	Which task do you feel was harder to complete?
2.	Do you think your motivation changed between the two trials?
3.	Do you think your motivation changed more throughout the duration of one of the trials?
4.	Which trial do you think you felt more tired from?
5.	Do you think in one of the trials you worked harder?

APPENDIX B: INSTITUTIONAL REVIEW BOARD APPROVAL

IOWA STATE UNIVERSITY
OF SCIENCE AND TECHNOLOGY

Institutional Review Board
Office for Responsible Research
Vice President for Research
1138 Pearson Hall
Ames, Iowa 50011-2207
515 294-4566
FAX 515 294-4267

Date: 4/13/2016

To: Dr. Guliz Tokadli
0068 Black Engineering

CC: Dr. Michael Dorneich
3018 Black Engineering Bldg
Olivia Janusz
119 Stanton Avenue Apt. 426, Ames, IA 50014

From: Office for Responsible Research

Title: Effects of Motivation on Performance

IRB ID: 16-135

Approval Date:	4/13/2016	**Date for Continuing Review:**	4/12/2017
Submission Type:	New	**Review Type:**	Expedited

The project referenced above has received approval from the Institutional Review Board (IRB) at Iowa State University according to the dates shown above. Please refer to the IRB ID number shown above in all correspondence regarding this study.

To ensure compliance with federal regulations (45 CFR 46 & 21 CFR 56), please be sure to:

- **Use only the approved study materials** in your research, **including the recruitment materials and informed consent documents that have the IRB approval stamp.**
- **Retain signed informed consent documents for 3 years after the close of the study,** when documented consent is required.
- **Obtain IRB approval prior to implementing any changes** to the study by submitting a Modification Form for Non-Exempt Research or Amendment for Personnel Changes form, as necessary.
- **Immediately inform the IRB of** (1) **all serious and/or unexpected adverse experiences** involving risks to subjects or others; and (2) **any other unanticipated problems involving risks** to subjects or others.
- **Stop all research activity if IRB approval lapses,** unless continuation is necessary to prevent harm to research participants. Research activity can resume once IRB approval is reestablished.
- **Complete a new continuing review form** at least three to four weeks prior to the **date for continuing review** as noted above to provide sufficient time for the IRB to review and approve continuation of the study. We will send a courtesy reminder as this date approaches.

Please be aware that IRB approval means that you have met the requirements of federal regulations and ISU policies governing human subjects research. **Approval from other entities may also be needed.** For example, access to data from private records (e.g. student, medical, or employment records, etc.) that are protected by FERPA, HIPAA, or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the institution(s) as required by their policies. **IRB approval in no way implies or guarantees that permission from these other entities will be granted.**

Upon completion of the project, please submit a Project Closure Form to the Office for Responsible Research, 1138 Pearson Hall, to officially close the project.

Please don't hesitate to contact us if you have questions or concerns at 515-294-4566 or IRB@iastate.edu.

Figure 2:IRB Approval Cover Page