3.3- Research Publication and Awards

3.3.2.1

Research Papers

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Theories of Willpower Affect Sustained Learning

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Introduction

Acquiring new cognitive abilities often requires sustained, effortful engagement with challenging tasks. Evidence suggests that even for the most talented individuals, becoming an expert in a new domain can require over 10,000 hours of training . Because of these steep requirements, the ability to persist in cognitively demanding tasks is crucial for achievement in many fields. We demonstrate that beliefs about the nature of willpower can promote or hinder learning on a strenuous mental task that taxes working memory.

Recent findings have highlighted the pronounced role that implicit theories about the nature of intelligence and personality traits play in shaping behavior. Most relevant to the current study, implicit theories about willpower have been shown to moderate the extent to which self-control suffers following a demanding mental task. Those participants who held, or were primed to hold, a "limited resource theory"–that is, who viewed, or were led to view, willpower as dependent on a resource that is easily be depleted through mental exertion–showed worse response inhibition and performance following a task with strong self-control demands. In contrast, holding the belief that mental exertion can be energizing (what we refer to as the "non-limited resource theory") eliminated these deficits.

If the non-limited resource theory has a relative positive effect on people's ability to sustain self-control, might these theories comparably affect cognitive growth in situations where learning requires sustained persistence on a strenuous task? We assess this by manipulating implicit theories about willpower and measuring sustained learning–improvement in performance (i.e., accuracy) over a series of trials on an extended, continuously challenging task that taxes working memory. Given the substantial attentional demands of this task, we predicted that participants primed to view willpower as relying on a limited resource would be less able to maintain the focus necessary to sustain learning compared to participants primed to view willpower as non-limited.

Methods

Fifty-six college students were randomly assigned to the "limited" or "non-limited" willpower group. Written informed consent was obtained from all participants, and the study was approved by the Institutional Review Board at Stanford University. Following past research, implicit theories about willpower were manipulated through 8-item biased question- naires intended to elicit agreement with one or the other theory about willpower. For example, participants assigned to the limited resource theory group rated their agreement with items such as, "Working on a strenuous mental task can make you feel tired such that you need a break before accomplishing a new task." Participants assigned to the non- limited resource theory group rated their agreement with items such as, "Sometimes, it is energizing to be fully absorbed with a demanding task." Participants responded to each item on a 4- point scale with 4 indicating maximum agreement. In each group, participants expressed strong agreement with the items

(Figure 51; Mlimited = 3.27, and Mnonlimited = 3.03; scale mid- point = 2.50), one-sample ts.6.80,

The primary dependent measure was performance on a 20- minute (540 trial) spatial 3-

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back task. On each trial, an X appeared on the screen in one of four locations for 0.5 seconds. Participants were instructed to press one of four buttons, corresponding to the location of the stimulus that appeared three trials before the present trial. Successful performance required continuous updat- ing and maintenance of working memory. Improvement in performance over time constituted our measure of sustained learning.

Theories of Willpower Affect Sustained Learning

Results and Discussion

We hypothesized that theories about willpower would influence participants' ability to sustain learning over time. Thus, we predicted that the two groups would demonstrate comparable accuracy and improvement initially but that participants in the non-limited condition would show sustained improvement over the full task. To test these predictions, we examined the effect of limited vs. non-limited condition on a two-piece linear growth model. We used a two-piece model because we hypothesized that participants in both groups would show improved performance in the beginning of the task but over time the performance of participants in the limited condition would level off or drop whereas that of participants in the non-limited condition would continue to improve. We simplified the model by dividing the 540 trials into eight equal-size blocks and modeled growth across the first four blocks and the second four blocks using Mplus 6.1 (the findings did not differ when alternative numbers of blocks were tested; see Text S2 for further information regarding this analysis method).

We found no effect of condition on the intercept (b = .066, SE = .052, p = .206), indicating that participants in both conditions were equally accurate initially. In the first half of trials, participants in both the limited and non-limited groups demonstrated significant improvements in performance (limited: b = .045, SE = .007, p,.001; non-limited: b = .042, SE = .009, p,.001).

Thus, the two groups did not differ in learning early in the task

(b = 2.004, SE = .012, p = .777). However, we did find a significant effect of condition on growth across the second half of the trials (b = .010, SE = .005, p = .040). Participants led to view willpower as limited did not improve during second half of trials (b = .003, SE = .003 p = .412), whereas participants who led to view willpower as non-limited continued to increase in accuracy (b = .013, SE = .003, p,.001). Only participants in the non-limited willpower condition sustained learning for the entire duration of the task

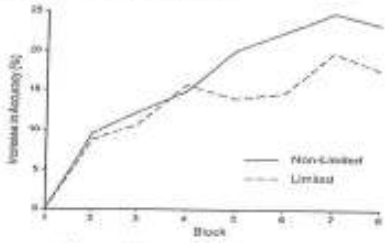
These results extend previous work linking motivation to cognitive performance and highlight the interactive nature of motivational and cognitive processes by demonstrating that implicit theories about willpower can affect people's ability to recruit cognitive resources to sustain learning over time. Whereas previous work assessing the impact of these implicit theories focused on decrements in performance following self-control demands. this experiment suggests that people's beliefs about the nature of willpower can also limit or facilitate the acquisition of a cognitive skill.

The simple nature of the manipulation employed in this study suggests that beliefs about willpower can be easily modified by subtle input, at least in the short-term. This point is especially important given that much recent academic and popular literature claims that human willpower is inherently limited. The current findings suggest that disseminating such notions may create self-fulfilling prophecies; leading people to believe that willpower is limited might contribute to decrements in willpower and undermine persistence and learning. Further, the demonstration that implicit theories about willpower can affect performance over a sustained duration stands in contrast to recent work sug-

gesting that these theories only improve performance under relatively mild conditions. The current results instead demonstrate that implicit theories can improve performance even for a very difficult and lengthy task.

The present findings suggest many important directions for future research. For instance, we have shown that theories of willpower influence learning during a task, but we have not determined whether or how long acquired information or skills are retained. Another important open question involves directionality. In particular, we have only demonstrated a relative benefit of priming a non-limited theory of willpower relative to a limited

Figure 1. Learning over time on 3-back task. Improvement in percent accuracy on the 3-back task relative to baseline for the limited and non- limited willpower groups over the full 20-minute time courseTheories of Willpower Affect Sustained Learning



theory. We cannot state whether a non-limited theory improves sustained learning, whether a limited theory undermines sustained learning, or both. Finally, we have taken the approach of priming one theory of willpower, but behaviorally relevant individual differences do exist in beliefs about willpower. It will be important to determine how promoting a belief interacts with preexisting theories of willpower to produce effects on behavior.

The present results are especially meaningful in light of evidence that links training-based improvements in performance on working memory tasks (e.g., a modified n-back task) to increased fluid intelligence. Whereas the working memory training implemented in this previous work was conducted over a series of sessions, the manipulation employed in the present study produced meaningful improvements in performance within a much shorter time frame. A more robust implementation of the intervention employed in the current study may produce effects that compound over time. As people improve on the task, the resulting success may feed back and reinforce the implicit theory that initially gave rise to these advantages. The potential of such a recursive process to expand working memory and fluid intelligence over extended training remains an important topic for future work.

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A Study of Physical Fitness Components of Kolhapur Basket Ball Players

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Abstract

Basket ball is a fastest game. Every player are strong mind, awareness and deter mination, during the course of play; the player must be physically and psychologically strong. Basket ball is an oldest sport played with a ball since similar game reportedly played in the Egyptian and Greek cultures as early as the eleventh century. Many researches have been conducted in Basket ball showed that it dependent upon physiques, specific physical fitness general physical fitness, skill involved in the game, tactical jollities and competitive abilities etc. of players. The purpose of the study was to determine the physical fitness components of different groups of urban and rural Kolhapur basketball school players. Age runing from 14-18 years and total number 200.

1 To determine the difference in physical fitness among different group of urban of Kolhapur school basketball players.

2 To determine the difference in physical fitness among different groups of rural Kolhapur school basketball players.

Introduction

Basketball is all world popular game that is played by several people all across the globe. Basketball is highly effective in promting the caediovascular health of its player. Basketball is an oldest sport played with a ball since similar game reportedly played in the Egyptian and Greek cultures as early as the eleventh century. Amateur Basketball federation of India (A.N.F.I.) introduced the basketball game in 1972 in India for men,women, girls, and boys. Performance in any sports depends upon certain factors i.e. physique and body composition, physiological and psychological etc. out of these physique and body composition are mostimportant. Similarly, many researches have been conductedin basketball showed that it dependent upon physiques, general physical fitness, specific physical fitness, skill involved in the game, tactical jollities and competitive abilities etc. of players (Milvi 2007). From these studies it is concluded that physique, body composition and physical fitness are essential ingredients for excellence performance at different levels of participation in basketball. Since physique and body composition provide a suitable raw material for specific game and sports, without proper parameters of size, shape and body composition, it is useless to spend lot of money and time on such type of Basketball players for their conditioning and training programs who are not suitable for this game. The selection and training can be done better with adequate knowledge of selected physical fitness components of the successful Basketball players. The present study was attempted to provide guidelines about the relationship of selected physical fitness components variables and Basketball performance and physical education teachers and coaches can be benefited to inform their trainees about the specific qualities that should possess for each Basketball player.

Physical Fitness:

To achieve the objectives of the present study, i.e., comparison of physical fitness of Urban and Rural basketball players Youth Fitness Test (1976) was utilized. The components and test items chosen to represent in the original battery were as follows:

1. Cardio-respiratory endurance - 600 yard run-walk

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2. Muscular power - Standing broad jump
3. Speed - 50 Yard dash
4. Flexibility - Reach and sit test
5. Agility - Zig Zag Run

1. Cardio-Respiratory Endurance

600 Yard Run-Walk Test: The purpose of this test was to measure the cardio-respiratory endurance of the subjects. To achieve the purpose, the 440 yard track was marked. The runners started behind a line upon the starting signal. The subject was required to complete one full lap plus 160 yards on the track. The spotter watched her runner and recorded the time called out by the timer as the finished line was crossed. The scoring was made in minutes and seconds.

2. Muscular Power

Standing Broad Jump: The purpose of this test was to measure the explosive strength of the legs in forcing the body to leap horizontally.

A take-off line was drawn on the ground. Each subject was asked to stand behind a take-off line with her feet comfortably apart. Before jumping, the subject was allowed dipping at the knees and swinging the arms backward. She then jumped forward by simultaneously intending the knees and swinging the arms forward to cover maximum possible horizontal distance, leaning on both the feet. Three trials were permittedand best jump was credited to her . The score was the horizontal distance measured in meter and centimeter to the nearest cm. between the take off line and the nearest point where any part of the subject's body touched the ground.

Variables	Urban		Rural		Sed	t-test
	Mean	SD	Mean	SD		
Endurance	2.31	0.11	2.10	0.38	0.027	3.00**
Speed	6.76	0.31	6.65	0.38	0.06	1.12*
Strength	1.32	0.08	1.30	0.01	0.017	3.41**
Flexibility	25.12	0.87	25.90	1.40	0.367	2.26*
Agility	4.30	1.00	4.41	1.11	0.366	[illegible]

3. Speed

50 Yard dash: The purpose of this test was to measure the running speed of the subjects. The subjects positioned behind the starting line. The tester commanded 'Ready' and 'Go' which was accompanied by a downward drop of her arm so that the timers at the first line could start the watch. The subject had to run as fast as possible across the finish line.

4. Flexibility

Sit and Reach Test: The purpose of this test was to measure the development of hip and back flexion as well as extension of the hamstrung muscles of the legs, sit and reach test was administered. Flex measure case with yardstick and ruler guide inserted were the equipments used for measuring the performance.The 15 inch mark of yardstick was lined-up with a line on the floor and the ends of the yardstick were tapped to the floor. The subject sat down and lined-up heels with the near-edge of the 15 inch mark and slided his seat back beyond zero and of the yardstick. With heels not more than 5 inches apart slowly she stretched forward, while touching the yardstick with the finger tips of both hands. The point touched was read and recorded. The best of three trials measured to the nearest of quarter of an inch wasthe subject's test score.

5. Agility

Zig-Zag Run: The purpose of this test was to measure agility primarily and speed secondarily. Equipments: Equipments needed to conduct this test were watched and five standards with flange. The subject at a point 'x' in a semi-crouched position on the command ' ready' and 'go', traversed the course for three times continuously, The subject was instructed not to grasp the stand of chairs that had been placed in the course as obstacles. If a foul was committed knocking an obstacle, a second travel was permitted. Time was recorded nearest to 1 / 10 of a second. Further from the table 1, It is clearly obvious that the differences in mean scores of endurance, speed, strength & flexibility components of physical fitness of rural school basketball players are found significant at 1% & 5% level except agility. It shows that the rural school

basketball players possess more endurancecapacity, speed, strength and flexibility as compared to urban school basketball players. Agility has been found statistically equal in both groups of Kolhapur school basketball players.

Discussions

Physical fitness of rural group players is more than those of the urban group because of heal thier and balanced diet. Due to the same reason, Endurance, speed, strength, Flexibility of the rural group basket ball players is more than that of urban group. Besides these factors the basket ball players of rural groups have to perform domestic duties due to which they have better physical fitness Components.

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