Gene Doping Consequences

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<u>Table of Contents</u>

Executive Summary

The human body can only withstand so much before it succumbs to its own limitations. These limitations are set by the body's own physical capabilities. Being victorious to an athlete is the most prized possession no matter what it takes. The answer that most athletes search for is, Gene Doping. Technology is able to alter limits to willing athletes, but is the world ready to create a super race? The struggle for perfection of the human body has been warring through the ages.

My projects subject, which is gene doping, was chosen so that I would know the risks that are involved in actually doing this. I have researched a great deal about gene doping but it has never been tested on humans. Gene Doping is expected to happen in the Olympics of 2008 in Athens. Not being able to test for gene doping, the association against gene doping is struggling. I chose gene doping because I wanted to know how much of a chance a person would have of dying in the years to come.

Creating a simple program that includes some of the risks in gene doping will tell a person how much of their life they are jeopardizing. I wanted to create a model that would tell me how much of a chance a person would have of getting cancer, an injury, or even just dieing. The people that are willing to put their lives on the line for achievement are going to need to know their risks. If one person was to gene dope, now matter what age how long would it take for them to lose all their energy and die? This is a question I asked in my programming.

To solve this, I had to assume everything because there has been no actual testing on gene doping. I used the program Star Logo to make sure that I can alter my assumptions very easily. Creating this program I think is a big step in science because it can be altered, depending on future testing in the field.

Problem Statement and Solution

The problem I investigated was "If one person was to gene dope, now matter what age how long would it take for them to lose all their energy and die?" I used the Star Logo Program and developed a simple program so that it can be altered if ever needed. The first thing I did was to create patches which resembled a few of the risks that were involved in gene doping. Such as a group of gray patches resembled cancer and a group of yellow patches resembled injury. I also created a group of red patches that resembled gene doping. Every time the turtle (person) moved into one of the squares they would either lose or gain energy. If the turtles (persons) energy level fell to .1 or below it died. Also another factor in my programming was age. For example, translating one of my lines for programming it says that if a turtle's (person's) energy level is below 30 and it goes into the gray patches (cancer) it will also die. All of these factors were connected into my programming. To test my results I used the turtle's stats window. I used both this and a timer to figure out the amount of years it took before a gene doped turtle would die. The speed my program worked at was 30%, so that I could further observer the turtles. In assumptions I also made ten years equivalent to ten seconds.

Results

What I found out is that using this program it gives a person that is questioning gene doping a chance to look at the amount of risk. I found that in twenty years most of the turtles did not die but ran into many illnesses. For example a turtle that lived for 20 years ran into injury twice and cancer once. His energy rate dropped to an all time low but with gene doping it was able to regain its energy back. I found out that even though the turtles differ in age they have all a good chance of developing cancer and injury. Eventually dying the turtles now know the consequences of the developing risks to gene doping.

Star Logo Results
Speed = 25%
Turtle Randomly
Placed
Energy = 50

	25	35	45	60	77.5	85
00s	50	50	50	50	50	50
05s	50	37.5	37.5	50	75	0
10s	25	37.5	37.5	25	42.187	0
15s	37.5	37.5	28.125	56.25	21.093	0
20s	28.125	37.5	10.546	56.25	21.093	0

Age	25	35	45	60	77.5	85
00s	Nothing	Nothing	Nothing	Nothing	Nothing	Nothing
05s	Nothing	Injury	Injury	Nothing	Gene Doping	Dead
10s	Cancer	Nothing	Nothing	Cancer	Cancer, Injury & Gene Doping	Dead
15s	Gene Doping	Nothing	Injury	Gene Doping *2	Cancer	Dead
20s	Injury	Nothing	Cancer & Injury	Nothing	Nothing	Dead

Energy Level by Age
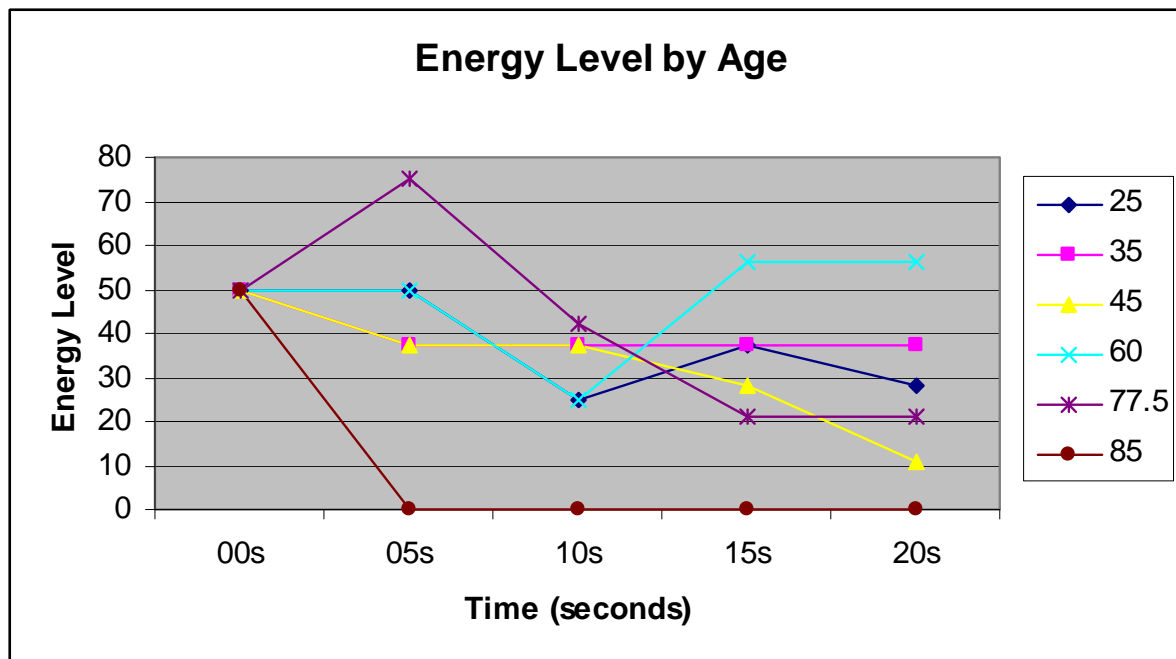
Conclusion

The perfection of oneself has been in the minds of many athletes, creating a very challenging situation. "We're pushing the human body, and we're pushing the human spirit. And we're trying to see how far it goes," this is a quote by an Olympic coach. All humans have a physical limit in their speed, agility, and strength. Soon athletes will be able to change those limits whether the world likes it or not. Will the world be ready for this?

This question is going to be asked by all. The people that are wanting to gene dope with my results will now be able to know the amount of risks there are in gene doping. To go into a major change in ones life is very difficult, peer pressure is going to be hard but at the same time they will finally have knowledge of exactly they are doing. The risks that are involved are very great and need to be looked at very seriously.

Most Significant Achievement

The most significant achievement that I have experienced in doing my project is to be able to program and now knowing how. I had to learn from a book rather than from a teacher. I was able to teach myself the basics of programming. I had to learn how to find my way when I was completely lost on what to do. In the end I was able to get help but from the beginning I wanted to challenge myself to learn. I have overcome so many problems in my programming as well. For example when I started my programming I did not know how to make sure everything worked, but through testing the actual project I began to develop a greater understanding of how the program worked.

The Code

Turtles Procedure

```
turtles-own [energy age deathrate]

to go
  wiggle
  check-patches
   ;set color based on energy
  move
  wait .05
end

to check-patches     ;change energy based on patch color
  if pc = yellow [setenergy (.75 * energy)]    ;lose 25% injury
  if pc = red    [setenergy (1.5 * energy)]    ;gain 50% gene doped
  if pc = gray   [setenergy (.50 * energy)]    ;lose 50% cancer
  if energy < .1 [die]              ;don't let energy go below .1
  if energy > 100 [setenergy 100]           ;or above 100
end

to die?                  ;deathrate based on age
  if age > 20 and age <= 30 [setdeathrate 10 setcolor orange]
  if age > 30 and age <= 40 [setdeathrate 10 setcolor 12]
  if age > 40 and age <= 50 [setdeathrate 10 setcolor purple]
  if age > 50 and age <= 70 [setdeathrate 30 setcolor brown]
  if age > 70 and age <= 85 [setdeathrate 100 setcolor black]
  if age > 85 [die]
  if (random 1000 ) < deathrate
   [die]

 if pc = gray and energy < 30 [die]            ;if cancer and energy level is below 30, turtle die
 if pc = yellow and energy < 10 [die]             ;if injury and energy level is below 10, turtle die
 if pc = blue and energy < 20 or age > 85 [die]    ;if old age and energy level is below 20, turtle
 die
end




to wiggle
  lt random 10
  rt random 10
end

to move
```

```
  fd energy / 5          ;move forward based on energy
end
```

Observer Procedure

```
patches-own [savedcolor]

to setup
  ask-turtles [die]
  crt number
  ask-turtles
    [setenergy random initial-energy
     scale-color 20 energy  0 100       ;set color based on energy
     setxy random screen-width random screen-height
     setage (random 100)]

end


to save-bkgd
  ask-patches
    [ set savedcolor pc ]
end


to restore-bkgd
  ask-patches
    [ setpc savedcolor ]
                                        end
```

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