RUNNING COLD

Colder weather = more calories burned?

Nick Alexander
MY FIRST RUN

March 17, 2013

Campton Hills, IL
Sunday 4:00 PM
Partly Cloudy

35°F | 1°C

Precipitation: 0%
Humidity: 59%
Wind: 14 mph
• **Date:** 2013-03-17
• **Time:** 4:30 – 4:41 PM (11 minutes)
• **Average METs:** 8.9
• **Calories Burned:** 107
• **Distance:** 0.99 miles
• **Average Speed:** 5.4 mph
• **Temperature:** 35º F
• **Humidity:** 59%
• **Wind:** 14 mph
• **Heart Rate 3 min after finish:** 130 bpm
• **Notes:** Felt terrible for 30 min after run
WHY DO THIS?

• To test a claim
WHY DO THIS?

• To test a claim
• Very low barriers
  • Can do it at home
  • Time commitment only ~15 min per trial
  • Makes me exercise
  • Already had the calorie tracker
  • Learn to do experiments
PROBLEMS WITH TIME

• Need better Time resolution
PROBLEMS WITH TIME

• Need better Time resolution
• Don’t use the first or last minute data point
  • Helps compensate for lack of precise synchronization between devices
  • Compensate for start and end effects
• Start and end trials with 2 minutes of no steps
  • Helps identify boundaries of the test
CONSTANTS

• Route
  • Distance (1 mile)
  • Elevation

• Clothing

• Run Speed (~)

• Run Duration (~)

• Time of Day (~)

VARIABLES

Weather
• Temperature
• Humidity
• Wind speed
• Barometric pressure

Calorie Burn
• Total & Peak Calorie Burn
• Avg. & Peak METs

Heart Rate
• Avg. & Max

Run Speed, Duration
• Fitness Level
METRICS
TOOLS

BodyMedia

Weather
wunderground.com
Temp @ KARR Airport
Calorie Burn by Minute for All Runs

Minutes Into Run

Calories Burned

Hot
Cold
Calorie Burn by Minute for All Runs

- **7-Minute Calorie Burn**
- **Cooldown**

**Axes:**
- **Calories Burned**
- **Minutes Into Run**

**Legend:**
- Red: Hot
- Blue: Cold
Temperature is negatively correlated with Peak Cals/Min

WHILE

Run Duration has NO statistically significant relationship with Peak Cals/Min
Temperature is negatively correlated with Calories Burned 7min

WHILE

Run Duration has NO statistically significant relationship with Calories Burned 7min
WHAT DID I LEARN?

• Results
  • Tentative: hypotheses is correct
  • Effect is small: maybe 5 calories difference per mile run

• Process
  • I am motivated by data collection
  • Start early and refine experimental process for an initial period
  • Do research into other metrics that could correlate
WEAKNESSES AND IMPROVEMENTS

• The more fit you become, the fewer calories you will burn doing the same activity
• Temperature & weather data collected 20 miles away
• Short run time = noisy data?
• Need more data for higher confidence
• Hat
CONTACT

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