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#### Fundamentals of Interpreting Test Results







# What's the purpose of testing?







#### Environments

Testing to get Results

Find failure mechanisms

Determine robustness

Detect weaknesses

An environment's set of stresses are difficult to replicate in a lab



#### Standards

Testing to get Results

Good for how to setup, apply, and measure

Not good for estimating robustness or durability



#### Modeling

Testing to get Results

Building a model

Verifying a model

Fitting parameters in a model

how far can you extrapolate?



### Are all results

### Meaningful?







#### Sample Size

Assumptions & Testing

Is one sample enough?

Is 1,000?

Sample of a population

Is the sample representative?



#### Failure Mechanisms

Assumptions & Testing

Do we know the mechanisms at play?

Will the stress excite the mechanisms of interest?

Does the mechanism respond in similar ways with each stress level?



#### Acceleration Factors

#### Assumptions & Testing

Never, ever, assume an activation energy.

Can the test provide model verification?

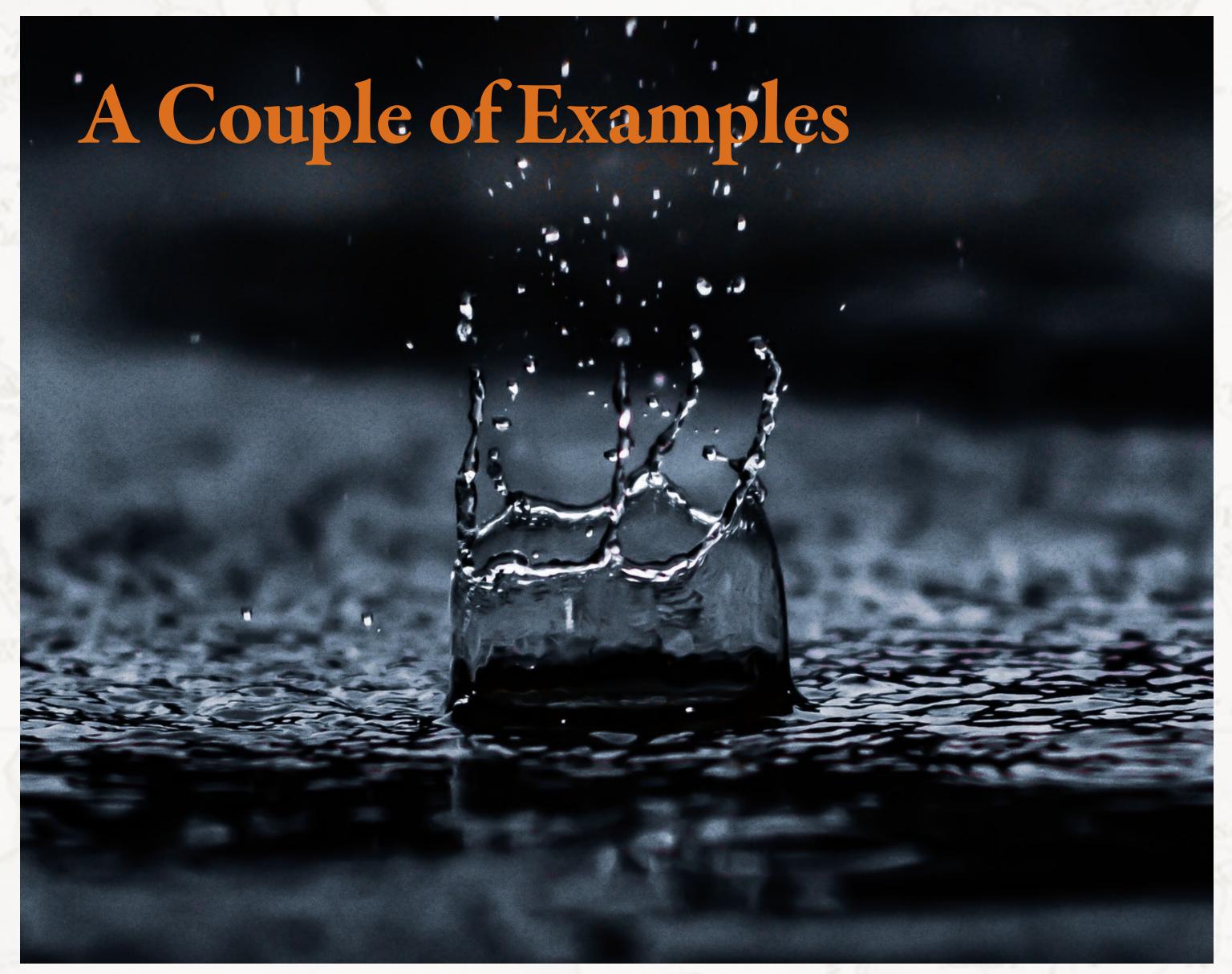
Can the test provide assumption checking?

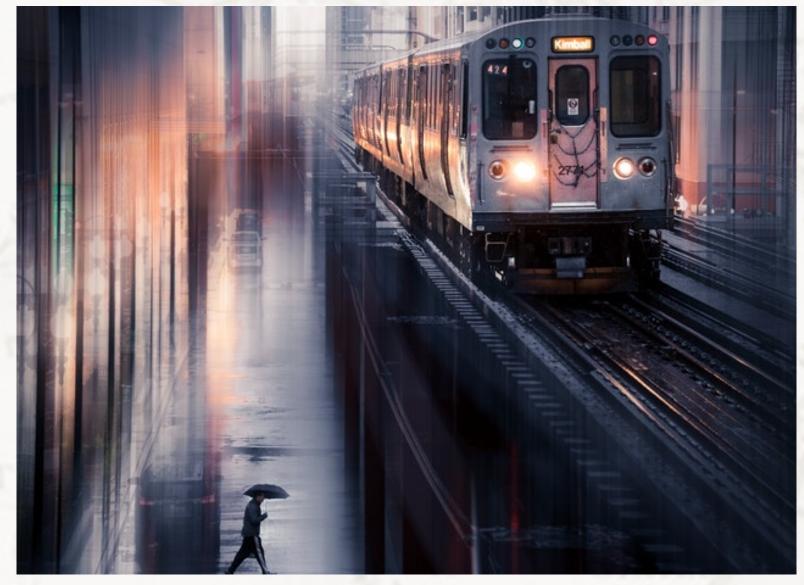
Is the AF linear over entire range of interest?



### Other assumptions?

### linear, interactions, ...







#### 85°C/85%RH

#### A Couple of Examples

What does having 22 samples that pass 1,000 hours in an 85°C at 85% RH mean?

for an applied finish on metal

for a solar panel

for a personal computer



### Life Testing A Couple of Examples



### Success Testing A Couple of Examples

22 samples and all pass

22 samples and one fails



### What results

### have you seen?

## Do testing well and trust your results.

### Thanks

see more at AccendoReliability.com