# Getting it Right: Several Analyses of a Repeated Measures Data Set

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**Abstract**

I discuss statistical modeling issues in the context of 9 different analyses of a repeated measures data set collected to study the effects of pain coping style (CS) and a treatment Time pressure usually demands that Statisticians analyze data sets quickly, resulting in the use of models and methods that are simple and easily available in standard software. Occasionally we have time to take one data set thoroughly apart so as to make an attempt at getting the model completely correct, or, in this case, at least we get to try out several to many different analyses. This talk sketches a portion of a long term analysis of a Pediatric pain repeated measures data set. The data consists of up to 4 repeated pain tolerance trials on 64 kids. Pain tolerance is assessed by the length of time the children can keep an arm immersed in cold water. Some of the problems with the data set are (a) some missing data, (b) censoring of large responses, (c) repeated measures, (d) non-constant variance, (e) not overwhelming statistical significance and (f) interest in designing a new study. Space doesn't permit the discussion of all of these problems, but I will discuss the path that my data analyses have taken and might take, and I compare and contrast some of the analyses, models and inference schemes.

**Key Words**: Bayesian Inference, Classical Inference, Model Selection, Model Specification, Robustness, Transformation,

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## 1 Introduction: Background and Considerations.

I've been analyzing this data set for perhaps 6 years now, since I first started collaborating with Dr. Lonnie Zeltzer director of the Pediatric Pain Program in UCLA's School of Medicine. The data set is a repeated measures data set with an underlying $2 * 3$ ANOVA type design. It will be described in detail in the next section.

An Assistant Professor cannot spend 6 years on a single project. We are required to publish; in my case, by developing Biostatistical research. When I was up for promotion to Associate Professor with tenure in UCLA's Department of Biostatistics, I had to prepare my Curriculum Vitae (CV) with a list of the papers that I had written or co-written. This provided an opportunity to inspect and to introspect upon my work to date, as far as developing statistical methodology.

The raw data is in the paper Weiss, Cho and Yanuzzi (1998). I will try to place the tables on my web site http:////rem.ph.ucla.edu/~rob for easier access to the raw data. Usually this material appears in my technical reports page which is referenced on this main page. You will need to edit the raw data files since they are LaTeXsource code, but this shouldn't be difficult.

## 2 The Pediatric Pain Study.

## 3 The Different Analyses.

## 4 The Data.

## 5 Discussion.

## References

+ - INDICATES TECHNIQUES DEVELOPED FOR AND/OR ILLUSTRATED ON PAIN DATA.
* - INDICATES TECHNIQUES APPLIED TO PAIN DATA SET AFTER PAPER WRITTEN.

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+ Zhang, F. and Weiss, R. E. (1998). Score Tests for Heterogeneity of Variance in Random Effects Models. Checking for nonconstant variance in the pediatric pain data.