The Line
*Originally performed by: Jimmy Eat World*
*Statistics lyrics by Kyle White*

Data, a scattered $n$ by $p$ set
It's only in your points you feel spread out, and
without trend
You want to test, if your set's a scam
and you worry when they tell your points,
"you're unexplained"

It just takes a line
$X$ prime $X$ beta equals $X$ prime $Y$
Everything, everything will fit just fine
Everything, everything will fit alright

Beta, you define that plane
That hat you're wearing makes you look pretty BLUE,
but no, not sad
You'd fit great, the data needs a friend
It doesn't matter if it's up or down, go find some trends!

It just takes a line
$X$ prime $X$ beta equals $X$ prime $Y$
Everything, everything will fit just fine
Everything, everything will fit alright, alright

Data, a scattered $n$ by $p$ set
It's only in your points they feel spread out, and
without trend
Just do your test, with beta hat's great plane
and hope that every, every $X$ in your set... remains!

It just takes a line
$X$ prime $X$ beta equals $X$ prime $Y$
Everything, everything will fit just fine
Everything, everything will fit alright, alright

It just takes a line
Minimize the sum of squares and it's a sign
Everything, everything will fit just fine
Everything, everything will fit alright
It's the Law
*Originally performed by: Bon Jovi
Statistics lyrics by Kyle White*

What would we do without the CLT?
What's a quick way to show consistency?
Your study's budget don't matter to me
I'm a statistician; I want more data, please!

It's the law
Large sample theory
Averages converge I guarantee
Asymptotics leave me in awe

(It's the law)
You have to think in terms of infinity
Confusing at first, almost surely
Asymptotics leave me in awe
It's. The. Law.

We hope you have a sample that's i.i.d.
Lindeberg's condition intimidates me
If you're feelin' stumped on these tough proofs
Just be thankful for Stefanski and Boos

It's the law
large sample theory
Averages converge I guarantee
Asymptotics leave me in awe

(It's the law)
Sometimes you need more than thirty
Crazy that strong implies weak
Asymptotics leave me in awe
It's. The. Law.

A hundred thousand monkeys
all typing away
they go long enough
they'll write my thesis some day

It's the law
large sample theory
Averages converge I guarantee
Asymptotics leave me in awe

(It's the law)
You have to think in terms of infinity
Confusing at first, almost surely
Asymptotics leave me in awe
It's. The. Law.
The CRLB

Originally performed by: The Caesars
Statistics lyrics by Kyle White and Bradley Turnbull

Theta one, theta two, which estimator do I choose?
Both of them unbiased, what now? I'm still so confused
I need a better measure than just looking at means
Calculating variance is smart, it seems
So here we go

'Cause it's easy when you know how it's done
Invert the information when the bias is none
Can't beat it, always bounded below
C-R lower bound

Too bad my stat is lacking some efficiency
Why can't someone out there tell me how to fix this please
Sufficient estimators will do the trick
Condition on them that will be my fix
So thank you Rao

'Cause it's easy when you know how it's done
Improve an estimator with a sufficient one
Just try it, you've got nothing to lose
Rao-Blackwell improves
**Super Bayes**
*Originally performed by: Nicki Minaj, Justin Bieber*
*Statistics lyrics by Kristin Linn*

This one is for the boys with the distributions
On their parameters, they be prior choosin'
And over model space, they be samplin' up
Markov chains with reversible jump

And he cool, got tools, he might have a rule
That minimizes risk and when I see him at school,
I trip, I flip, wanna kiss him on the lip
'Cause with a Bayes factor, he's so freakin' hip

Conjugate or not not, do you think I'm hot hot?
Based on my posterior, do I have a shot?
You're the kinda dude I was lookin' for
'Cause your unknowns are random, yo

I said, excuse me, you're a heck of a guy,
I mean, my my my my, MCMC is fly, I mean,
You're not shy around empirical types,
And your estimates perform like a frequentist's might

Hot burn-in samples, now
I need an introduction 'cause I ain't Rao.
I am Kristin Linn, I love statistics, I take limits.

Multiply my likelihood by your prior.
Be my conjugate and I'll take you higher.
Don't you love those
bay bay bay bay bay bay bay bay bay Bayesians
super Bayes,
Bay bay bay bay bay bay bay bay bay Bayesians
super Bayes

You have an unknown you want to find
Give it a prior, and multiply by
The likelihood of your data
Ignore that constant denominator

Now you have it, a posterior
How will you use it?
The choice is yours
Forget your p-values tonight
I'm 95% sure you'll be alright

Bayes rule it will set you free
No more p-values and finally
Forget that crazy closed form density
Sample from it using MCMC

If objective is the way to go
Under transformation one can show
There's a prior invariant and so
Thank you Jeffreys, you are my hero
When I was 22, I had my first love
   His name was Bayes, no it wasn't just a phase
And we used to stay up all night coding WinBUGS
   Sampling with MCMC, oh I was star struck
He woke me up daily, don't need no Starbucks
   We'd go on random walks
Diagnose all our problems of convergence with
   Autocorrelation plots
And he was really good at minimizing his risk
   'Cause he was so amazing.
   Freq 3:16 is fading
And now I keep on saying...

Bayes rule it will set you free
   No more p-values and finally
Forget that crazy closed form density
   Sample from it using MCMC
Bayesians 'round the world agree
   Both objective and subjectively
It makes sense to update prior beliefs
Bayes I love you, you're the one for me