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# Building Depth of Understanding in and Appreciation of Mathematics Based on Adolescent Brain Research

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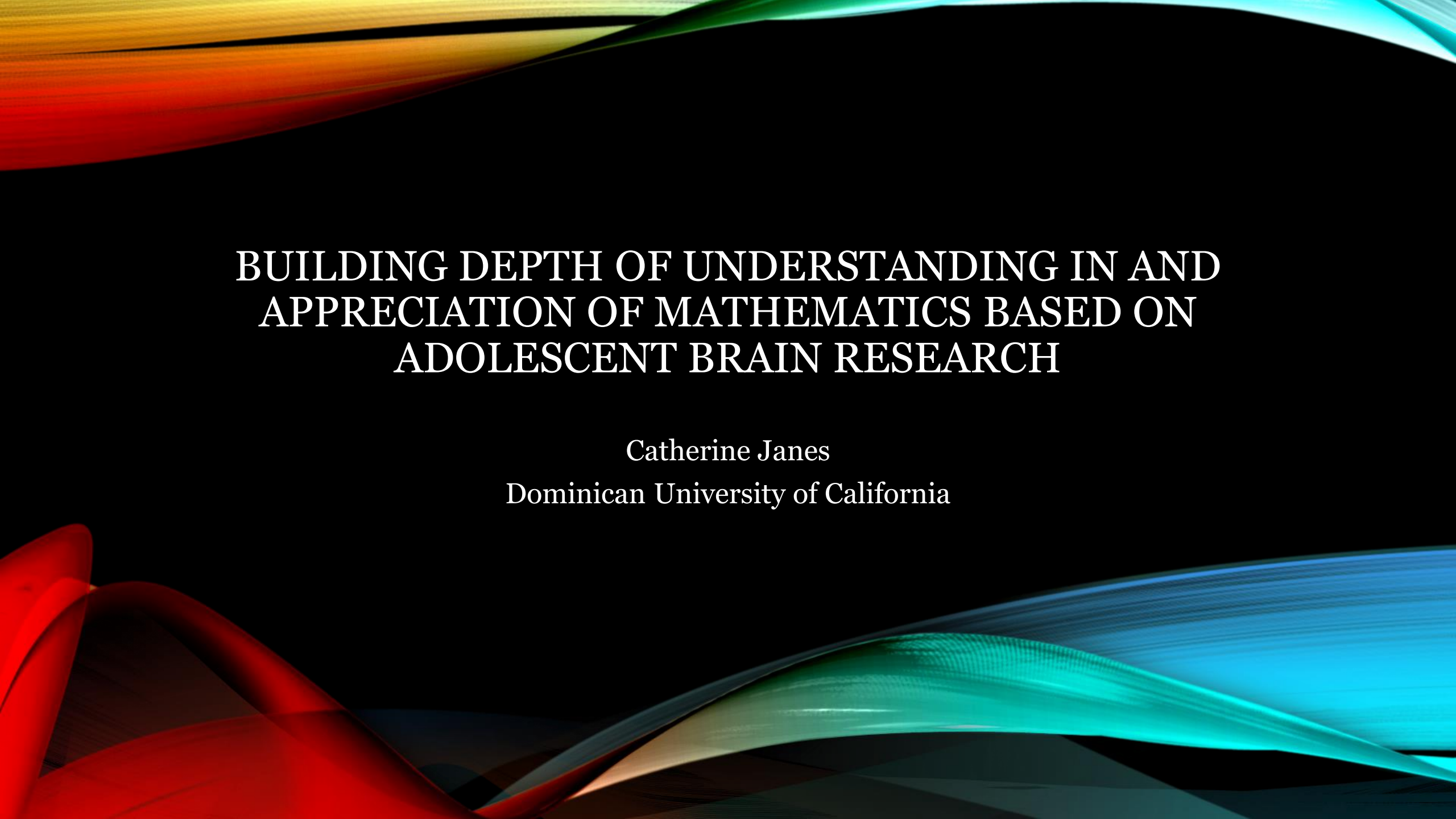
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**BUILDING DEPTH OF UNDERSTANDING IN AND  
APPRECIATION OF MATHEMATICS BASED ON  
ADOLESCENT BRAIN RESEARCH**

Catherine Janes

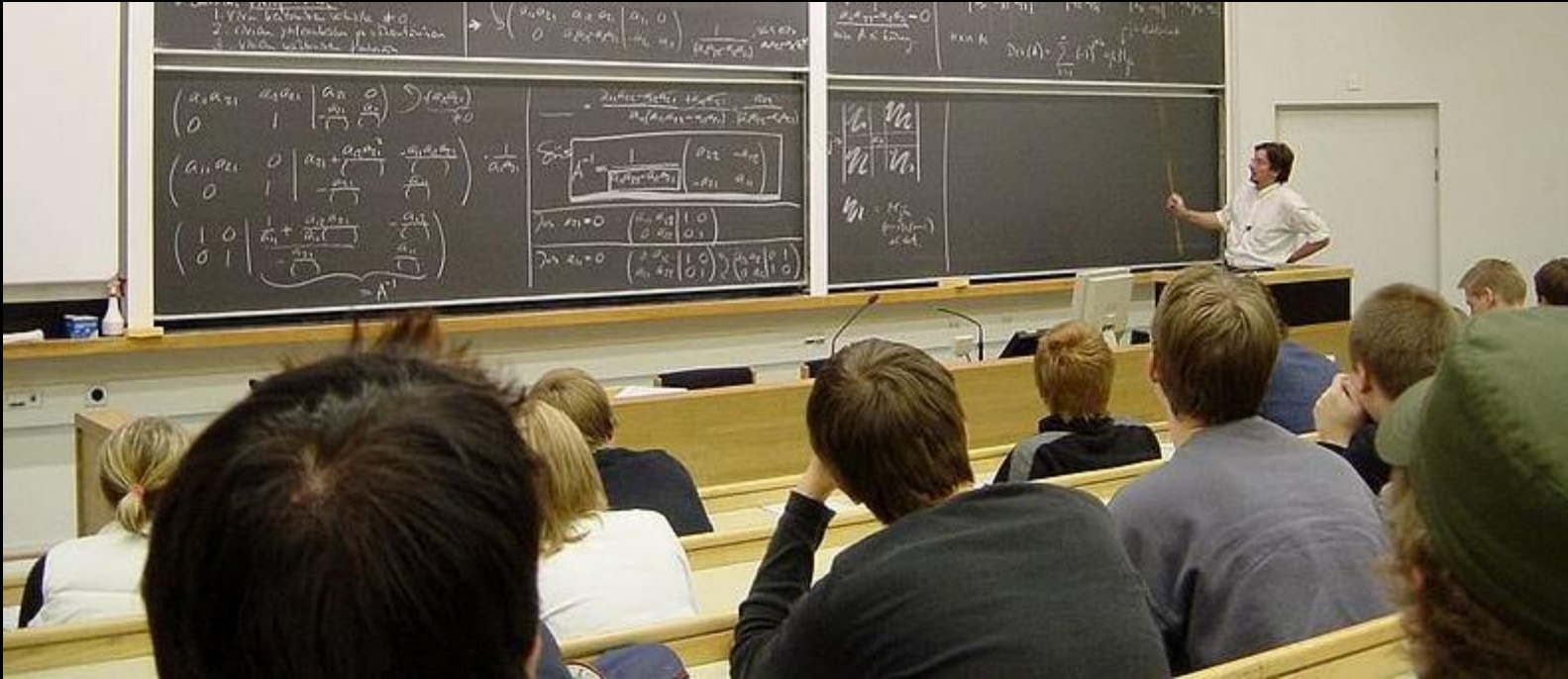
Dominican University of California

- History of Math Education
- Social Constructivism
- Teenage Brain and Adolescent Development



*Gears Brain 2*[Clip Art]. Retrieved April 17, 2015, from: URL (<http://pixshark.com/brain-gears.htm>)

# HISTORY OF MATHEMATICS EDUCATION



[Untitled photograph of math lecture]. (2011). Retrieved April 17, 2015, from: URL (<http://dailycaller.com/2011/12/16/thousands-to-potentially-see-pell-grant-cut/>)

$$\begin{array}{r} 36 \\ \times 24 \\ \hline 744 \\ + 720 \\ \hline 864 \end{array} \quad \begin{array}{l} (4 \times 36 = 144) \\ (2 \times 36 = 72, \\ \text{with a } 0 \text{ added in} \\ \text{the ones' position}) \end{array}$$

Masnick, M. (Creator). (2011). *The way we used to multiply* [clip art], Retrieved April 17, 2011, from: URL (<https://www.techdirt.com/articles/20110310/03354413427/changing-way-that-math-is-taught-to-children.shtml>)



# SOCIAL CONSTRUCTIVISM



[Untitled photograph of collaborative learning]. (2013). Retrieved April 17, 2015, from: URL (<http://edge.ascd.org/blogpost/5-tips-to-make-your-collaborative-learning-plans-effective>)



[Untitled clip art of teamwork]. (2014). Retrieved April 17, 2015, from: URL (<http://joelcadwell.blogspot.com/2014/11/building-blocks-compelling-image-for.html>)

# TEENAGE BRAIN AND ADOLESCENT DEVELOPMENT



[Untitled photograph of a teenage brain]. (2011). Retrieved April 17, 2015, from: URL (<http://www.treatment4addiction.com/drugs/society/teen-brain/#>)



[Untitled photograph of a teens socializing]. (2013). Retrieved April 17, 2015, from: URL (<http://teensofhs.blogspot.com/2013/01/socializing.html>)

# NEXT STEPS



[Untitled photograph of a person about to step]. Retrieved April 17, 2015, from: URL (<http://orchardcommunity.org/next-steps/>)

# REFERENCES

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- Ellis, M. W., & Berry, R. Q. I.,II. (2005). The paradigm shift in mathematics education: Explanations and implications of reforming concepts of teaching and learning. *Mathematics Educator*, 15(1), 7-17.
- Lau, P. N., Singh, P., & Hwa, T. (2009). Constructing mathematics in an interactive classroom context. *Educational Studies in Mathematics*, 72(3), 307-324.



# REFLECTIONS QUESTIONS



*Little Girl Reflecting* [Photograph]. (2014) Retrieved April 17, 2015, from:  
URL ([winnersdrinkmilk.com/2014/01/a-successful-new-years-resolution-does-it-exist/](http://winnersdrinkmilk.com/2014/01/a-successful-new-years-resolution-does-it-exist/))