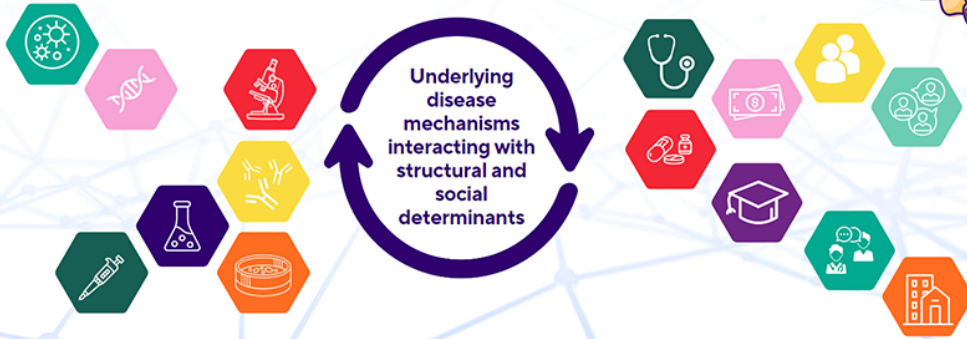




19TH ANNUAL CHILD HEALTH RESEARCH DAYS
Outcomes in Child Health



October 25 + 26, 2023 | RBC Convention Centre, Winnipeg, Manitoba

Abstract Submission Form

CHRD 2023: Abstract Submission Form

Submitter Name

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Presenter Name

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Presenter Status

Undergraduate Students

Research Category

Clinical

Role in the project

Design
Perform Experiments
Analyze Data
Write Abstract

Title

"One cookie now or two later?": Examining pediatric physiology across a delay of gratification task using wearable technology

Background

Delaying gratification can be difficult for children, but is an important skill for controlling frustration and succeeding in school. Biological processes, like heart rate, are known to play a vital role in regulating our response to challenges (e.g., delaying gratification).

Objective

Given limited physiological research on delay of gratification (DoG), we used wearable technology to investigate and clarify how DoG relates to heart rate in preschool-aged children. We hypothesized that heart rate would vary depending on ability to delay gratification; specifically, difficulty delaying gratification would be associated with greater resting heart rate, lower reactivity, and longer recovery to baseline.

Methods

Heart rate was collected using Fitbit Inspire 2 smartwatches at baseline, during, and one minute following a DoG task for N = 55 children as part of the Building Regulation in Dual Generations (BRIDGE) study pre-assessment. To test DoG, children could choose to either eat one cookie immediately, or receive two if they could wait for five minutes. Repeated-measures ANOVA, along with post-hoc analyses, examined associations between ability to delay gratification, time, and heart rate.

Results

Of the 55 participants, N = 30 were included in analyses because heart rate data were available for all timepoints (Table 1). Analyses showed that children who did not delay had a significantly higher heart rate than children who did delay [$F(1,28) = 6.397, p = 0.017, \eta^2 = 0.186$]. Heart rate also differed over time [$F(1.646,46.093) = 11.070, p < 0.001, \eta^2 = 0.283$]. Specifically, for all children, heart rate was higher during and following the task compared to baseline (Table 2). Counter to hypotheses, there was no interaction between time and DoG.

Conclusion

Overall, we demonstrated a relationship between DoG and heart rate in children. These results further promote using wearable technology in the pediatric population and future research studying the physiology of DoG.

Table/Figure File

CHRD-2023_Tables-Graph_Hayley-Turner.pdf

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Table 1*Descriptive Statistics for Pediatric Heart Rate (Divided Based on Ability to Delay Gratification)*

Time Period	Group	<i>N</i>	<i>M</i>	<i>SD</i>
Baseline	Did not delay	6	104.97	8.84
	Did delay	24	98.00	9.79
	Total	30	99.40	9.88
During Task	Did not delay	6	112.96	10.02
	Did delay	24	101.08	9.01
	Total	30	103.46	10.25
Post-Task	Did not delay	6	114.17	8.01
	Did delay	24	104.04	9.55
	Total	30	106.07	10.02

Table 2*Pairwise Comparisons using Least Significant Difference*

Time (I)	Time (J)	Mean Difference (I – J)	Std. Error	Sig.	95 % CI	
					LL	UL
1	2	-5.533*	1.636	0.002	-8.884	-2.182
	3	-7.617*	1.995	< 0.001	-11.703	-3.530
2	1	5.533*	1.636	0.002	2.182	8.884
	3	-2.083	1.320	0.126	-4.787	0.620
3	1	7.617*	1.995	< 0.001	3.530	11.703
	2	2.083	1.320	0.126	-0.620	4.787

Note. 1 = Baseline, 2 = During Task, 3 = Post-Task; *CI* = confidence interval; *LL* = lower limit; *UL* = upper limit.

* The mean difference is significant at the 0.05 level.

Mean Heart Rate Based on Ability to Delay Gratification Over Time

