



BACKGROUND: ERPs AND REWARD PROCESSING

• The ability to process rewarding outcomes of our behaviour is critical to adaptive functioning (Thorndike, 1965) • Most reward-related research to date has focused on monetary or other non-social rewards (Foti et al., 2015; Knutson et al., 2008) • There has been a recent surge in interest in social reward and its relevance to psychological dysfunction (Healey et al., 2014; Kujawa et al., 2014) • Few studies have directly compared neural response to different types of reward (e.g., monetary and social) • The reward positivity (RewP) is an ERP sensitive to the receipt of reward compared to non-reward and localizes to structures implicated in reward processing (e.g., putamen; Foti et al., 2011) Question ONE: Are the RewPs elicited by different types of rewards (e.g., monetary and social) associated with one another? • Few studies have compared processing of different reward types at different stages in development • During adolescence, social relationships become increasingly complex and peer feedback becomes paramount (Vaillancourt et al., 2013; Parker et al., 1995) Question TWO: Is the incentive value and neural processing of different types of reward consistent across development? METHOD **Participants: Early Adolescents:** n = 39 females, mean age = 12.38 **Emerging Adults:** n = 48 females, mean age = 20.29 • Tasks: Island Getaway – Social Reward • Feedback indicates acceptance or rejection 2000ms 2000-3000ms on click Should we keep Gabby or kick her out Kick Out **Doors – Monetary Reward** Feedback indicates winning \$0.50 or losing \$0.25





• EEG Recording:

Early Adolescents: 34-channel cap (10/20 system) and ActiveTwo BioSemi system (BioSemi, Amsterdam, Netherlands). Mastoid references. **Emerging Adults:** 32-channel cap (10/20 system) and BrainVision actiCHamp system (Brain Products, Munich, Germany). Mastoid references.

OR

• Principal component analysis (PCA):

- 4 temporospatial PCAs conducted (one in each age group and with each task; Dien, 2010)
- Robust ANOVA conducted on PCA factor combinations accounting for ≥ 0.5% of variance, to determine which factors significantly differentiated reward and non-reward conditions
- Factor combinations that significantly differentiated conditions, corresponded to a known ERP, and/or accounted for > 1% of variance were selected for additional analyses

MONETARY AND SOCIAL REWARD IN EARLY ADOLESCENCE AND EMERGING ADULTHOOD Paige Ethridge¹, Autumn Kujawa², Kodi B. Arfer³, Ellen M. Kessel⁴, Daniel N. Klein⁴, & Anna Weinberg¹

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RESULTS: RAW E

Time (ms)

RP WAVEFORMS			
Emerging Adulthood	Age Group	Task	
-6 -4 -2 0 2 4 6 - 2 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2	Early Adolescents <i>t</i> (36)	Social Monetary	
\overrightarrow{S} \overrightarrow{S} \overrightarrow{B}	Emerging Adults t(43)	Social Monetary	
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	Dien, J. (2010). The potential data. <i>Jour</i> Foti, D., Weinberg, differentiates rewa of the feedback neg Healey, K. L., Morga prefrontal response	ERP PCA Toolki nal of neuroscie A., Dien, J., & H rds from nonreg gativity. Hum Br an, J., Musselma e to mutual likir	
600 800 ce scores (non-reward minus reward; △RewP)	Parker, J. G., Rubin, K. H., Price, J. N adjustment: A developmental psyc <i>psychopathology</i> (Vol. 2). New Yor		

TRAC lab

RESULTS: RewP FACTOR COMBINATIONS

	Temporospatial factor combination	Variance explained (%)	Temporal loading peak (ms)	Spatial distribution	Non-reward vs. reward
	TF5/SF1	1.63	343	Frontocentral positivity	8.37**
,	TF5/SF1	1.42	317	Frontocentral positivity	10.26**
	TF3/SF1	7.98	297	Frontocentral positivity	9.45**
,	TF3/SF1	7.81	272	Frontocentral positivity	37.30***

< .001

CORRELATIONS BETWEEN MONETARY AND SOCIAL REWARDS



DISCUSSION

ocial rewards elicited a morphologically similar RewP in early l emerging adulthood

is not a monolithic construct

scents, reward elicited a larger RewP than non-reward, but we found no cross reward types

dults, reward elicited a larger RewP than non-reward, but the difference ard and non-reward was larger for monetary than social incentives nses to monetary and social rewards were not correlated within emerging adults, but were correlated at a trend level in early

les evidence for both domain-general and category-specific reward

ave implications for future studies seeking to examine individual ural responses to reward across development

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