

## **Citation Chapter 11**

### **1. Social laughter is correlated with an elevated pain threshold**

#### **Abstract**

“Although laughter forms an important part of human non-verbal communication, it has received rather less attention than it deserves in both the experimental and the observational literatures. Relaxed social (Duchenne) laughter is associated with feelings of wellbeing and heightened affect, a proximate explanation for which might be the release of endorphins. We tested this hypothesis in a series of six experimental studies in both the laboratory (watching videos) and naturalistic contexts (watching stage performances), using change in pain threshold as an assay for endorphin release. The results show that pain thresholds are significantly higher after laughter than in the control condition. This pain-tolerance effect is due to laughter itself and not simply due to a change in positive affect. We suggest that laughter, through an endorphin-mediated opiate effect, may play a crucial role in social bonding.”

#### **Link**

<http://rspb.royalsocietypublishing.org/content/279/1731/1161>

#### **Reference**

Dunbar, R. I. M., R. Baron, A. Frangou, E. Pearce, E. J. C. Van Leeuwen, J. Stow, G. Partridge, I. Macdonald, V. Barra, and M. Van Vugt. "Social Laughter Is Correlated with an Elevated Pain Threshold." *Proceedings of the Royal Society B: Biological Sciences* 279.1731 (2011): 1161-167.

### **2. Early origins of inflammation: microbial exposures in infancy predict lower levels of C-reactive protein in adulthood**

#### **Abstract**

“Ecological factors are important determinants of the development and function of anti-pathogen defences. Inflammation is a central part of innate immunity, but the developmental factors that shape the regulation of inflammation are not known. We test the hypothesis that microbial exposures in infancy are associated with high sensitivity C-reactive protein (CRP) in adulthood using prospective data from a birth cohort in the Philippines ( $n = 1461$ ). Lower birth weight was associated with increased CRP, consistent with a role for inflammation in the widely documented inverse relationship between birth weight and adult cardiovascular diseases. In addition, higher levels of microbial exposure in infancy were associated with lower CRP. These associations were independent of socioeconomic status, measures of current body fat and other health behaviours. We conclude that measures of microbial exposure and nutrition during the pre-natal and early post-natal periods are important predictors of CRP concentration in young adulthood. We speculate that the development of anti-inflammatory regulatory networks in response to early microbial exposure represents plasticity in the development of anti-pathogen defences, and that this process may help explain the low CRP concentrations in this population.”

## **Link**

<http://rspb.royalsocietypublishing.org/content/early/2009/12/08/rspb.2009.1795>

## **Reference**

McDade, T. W., J. Rutherford, L. Adair, and C. W. Kuzawa. "Early Origins of Inflammation: Microbial Exposures in Infancy Predict Lower Levels of C-reactive Protein in Adulthood." *Proceedings of the Royal Society B: Biological Sciences* 277.1684 (2009): 1129-137.

### **3. Preterm Infant Massage Therapy Research: A Review**

#### **Abstract**

“In this paper, preterm infant massage therapy studies are reviewed. Massage therapy has led to weight gain in preterm infants when moderate pressure massage was provided. In studies on passive movement of the limbs, preterm infants also gained significantly more weight, and their bone density also increased. Research on ways of delivering the massage is also explored including using mothers versus therapists and the added effects of using oils. The use of mothers as therapists was effective in at least one study. The use of oils including coconut oil and safflower oil enhanced the average weight gain, and the transcutaneous absorption of oil also increased triglycerides. In addition, the use of synthetic oil increased vagal activity, which may indirectly contribute to weight gain. The weight gain was associated with shorter hospital stays and, thereby, significant hospital cost savings. Despite these benefits, preterm infant massage is only practiced in 38% of neonatal intensive care units. This may relate to the underlying mechanisms not being well understood. The increases noted in vagal activity, gastric motility, insulin and IGF-1 levels following moderate pressure massage are potential underlying mechanisms. However, those variables combined do not explain all of the variance in weight gain, highlighting the need for additional mechanism studies.”

#### **Link**

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2844909/>

#### **Reference**

Field, Tiffany, Miguel Diego, and Maria Hernandez-Reif. "Preterm Infant Massage Therapy Research: A Review." *Infant Behavior and Development* 33.2 (2010): 115-24.