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SPOTLIGHT ON METHOD/ANALYSIS

Endocrinology in Communication Research

Kory Floyd

Endocrinology—the study of hormones and hormonal activity—offers promising new avenues for adjudicating social behavior. This paper introduces its methods and discusses several considerations necessary for researchers who wish to incorporate such methods into their own communication research.

Keywords: Endocrinology; Hormones; Social Behavior

Anecdotal accounts abound of the ways in which hormones affect social behavior. People are quick to implicate hormonal activity to explain the mood swings of expectant mothers, for example, or the erratic behavior of adolescents; yet, an understanding of exactly *how* hormones and behaviors interact has long been elusive. Contemporary research has begun to illuminate how hormones influence—and are influenced by—social behavior, and many of those findings have direct implications for those seeking to understand human communication. In this article, I briefly describe how hormonal measurement has illuminated communicative processes and how communication researchers can capitalize on endocrinology to more fully understand the human social animal.

Hormones and Social Behavior

Hormones are chemical messengers, produced and regulated by the endocrine system, that influence the metabolic rate of target cells (Goodman, 2009). Research in the field of psychoendocrinology has documented that levels of several hormones—including cortisol, testosterone, oxytocin, serotonin, epinephrine,

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prolactin, vasopressin, and adrenocorticotrophic hormone—are associated with a variety of communicative behaviors such as aggression, caregiving, deception, flirtation, affection, and conflict (for a recent review, see Floyd & Afifi, 2012). Communication researchers can, therefore, learn much about social interaction by paying attention to its hormonal substrates.

Selecting the appropriate hormones for study is a researcher's first task—one that can be challenging for at least two reasons. First, humans have nearly 70 different hormones (Melmed, Polonsky, Larsen, & Kronenberg, 2012); and, although behavioral scientists routinely study far fewer, having a basic understanding of endocrine physiology helps researchers identify those hormones most likely to covary with their communication behaviors of interest. Second, unlike self-report instruments or coding schemes—whose sole purpose is to operationalize a construct—hormones have more important jobs than to be research variables. Researchers must, therefore, account for issues such as time of day; recency of eating, sleeping, and exercise; tobacco and alcohol use; pregnancy; medication use; history of illness; and other physical factors that affect hormone levels independently of the social constructs they are manipulating or measuring.

Measuring Hormone Levels

Unlike most communication variables, hormone levels cannot be measured through self-report scales or behavioral observations. Instead, they require the analysis of body fluids, which, in turn, necessitates attention to the logistics of sample collection, analysis, and safety.

Sample Collection

Although hormones are detectable in spinal fluid, amniotic fluid, tears, semen, vaginal secretions, urine, and sweat, most psychoendocrinology studies collect saliva or blood. Therefore, I focus on those fluids, with the caveat that this discussion is far from exhaustive.

Saliva. Many hormones of interest to communication researchers can be measured in saliva. Those include stress hormones, such as cortisol, as well as reproductive hormones, such as testosterone, progesterone, and prolactin. Saliva sampling is advantageous for at least four reasons. First, it is noninvasive and relatively non-stressful for participants. Second, it is a simple procedure, reducing the need for extensive training and allowing for sampling to be done *in situ* when warranted. Third, saliva is a chemically stable material that can be frozen for storage, if necessary, with minimal loss to hormone levels. Finally, saliva is not considered a biohazardous substance, making it far safer to handle than many other fluids.

The most commonly used device for collecting saliva samples is the Salivette, manufactured by Sarstedt (Nümbrecht, Germany). The Salivette is a plastic test tube-shaped device containing a cotton dental roll. To collect a sample, participants put the cotton roll in their mouths for 30 to 45 sec to saturate it with saliva. The roll

is placed inside a small plastic cylinder, which is inserted into the tube and sealed at the end with a stopper. Salivettes are then centrifuged, which draws the saliva out of the cotton and into the tube through a small hole in the cylinder.

Blood. Many other hormones implicated in social behavior, such as vasopressin, oxytocin, and adrenocorticotrophic hormone, require the collection of venous blood samples. For safety, only a properly licensed medical professional—such as a nurse, phlebotomist, or medical assistant—should perform venipuncture.

When collecting blood samples, the researcher must know whether the intended hormonal tests require whole blood, serum, or plasma, as that affects the type of tube into which the blood should be drawn. Once blood is drawn, it will clot unless treated with an anticoagulant. If whole blood or plasma is required, the tube must contain an anticoagulant gel. In contrast, if serum is required, then the tubes are treated with a clot activator to initiate coagulation.

Sample Analysis

Several methods exist for conducting hormonal analyses, or *assays*, including radioimmunoassay, chromatography, and enzyme-linked immunoabsorbent assay. Because of equipment requirements, many social scientists are unable to conduct assays themselves. Such researchers instead enlist the services of an outside laboratory to perform the analyses, and there are two primary strategies for doing so. One strategy is to collaborate with scholars on one's own campus—for example, in disciplines such as clinical psychology, psychophysiology, kinesiology, nursing, or behavioral health—whose laboratories are equipped for hormonal assays. A second option is to send fluid samples to a commercial service laboratory, which typically offers a range of assay services (with fees that vary according to the type of hormone being analyzed and the number of samples being processed).

Regardless of the type of testing facility used, researchers must become aware of the requirements for packaging and shipping their samples to the facility. Fluid samples can be sent by mail or carrier service (via FedEx or UPS) only if they are properly packaged and identified. Testing facilities may also require samples to be packaged with dry ice. Especially given the labor and expense involved in collecting their fluid samples, researchers should consult with personnel at the testing facility to ensure that they ship all samples properly.

General Safety Considerations

For the protection of everyone involved, researchers must enforce certain safety standards whenever research designs involve sampling body fluids. Safety requirements vary according to the risk inherent in the fluid being handled, making them more stringent for blood, say, than for saliva. Regardless, researchers must:

- Ensure that everyone involved in the research process—including research assistants—be properly trained.

- Require proper clothing and protective gear to be worn at all times.
- Make certain that the work environment has proper lighting and ventilation to protect against airborne infection.
- Enforce procedures for proper handling and disposal of hazardous waste.

In each case, a university's research safety personnel can advise on the proper procedures to observe. For reasons of both personal safety and institutional liability, it is imperative that researchers educate themselves about important safety considerations and enforce them without exception in their research activities.

Although they require attention to theoretic and pragmatic issues uncommonly encountered in communication research, the methods of endocrinology offer much in the way of increased understanding about human behavior. Industrious communication researchers can, therefore, employ such methods toward significant advances in communication scholarship.

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