

# New frontiers in Information Integration Theory

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This special issue contains a selection of papers presented at the Fifth Biennial International Conference on Information Integration Theory and Functional Measurement held in Acre, Israel, on June 8-10, 2015. This conference gathered together more than twenty researchers from Israel and Western Europe. The studies reported in the papers they presented were applications of Information Integration Theory and Functional Measurement (IIT/FM, Anderson, 2008, 2012, 2013) to very diverse settings, ranging from neuropsychology (functional analysis of patterns of cortical activation in an integration task using pairs of emotional faces) to political science (functional analysis of emotional and behavioral responses to a terrorist plot against commercial flights).

In this special issue, the 12 presentations that have been accepted for publication have been grouped together into six headings: Neuropsychology (two papers), Intuitive physics (one paper), Economic Psychology (two papers), Sport and Exercise Psychology (one paper), Moral Science (three papers), and Political psychology (three papers). An overview paper was offered by Norman Anderson.

## Overview paper

In this paper, entitled “Information Integration Theory: Unified Psychology based on three mathematical laws”, Norman H. Anderson argued that, despite continued fragmentation of the psychological field into largely insular

areas, a unified approach is possible based on three mathematical laws of information integration: adding, averaging and multiplying. These integration laws are laws of the internal world. They relate unobservables of the internal world with observables in the external world. They have done well in almost every area of human psychology, from affect, motivation, attitude, and person cognition to learning, perception, and judgment-decision. Examples of applications of Information Integration Theory to psychophysics (the size-weight illusion), cognitive science (the issue of functional memory), social (person cognition among adults) and developmental psychology (blame attributions among children), and interpersonal relationships (marital interaction), are presented and discussed.

## Neuropsychology

In the first paper of this section, entitled “Brain activation follows adding-type integration laws: Brain and rating responses in an integration task with pairs of emotional faces”, Telmo Pereira (University of Coimbra) and his colleagues examined the relation between rating responses and the patterns of cortical activation in an integration task using pairs of emotional faces. Three discrete emotions were considered—Joy, Fear, and Anger—and varied across three levels of expression intensity. Some face pairs portrayed the same emotion (same-emotion pairs), others two different emotions (distinct-emotions pairs). Adding-type rules were found for the ratings of both same-emotion and different-emotions pairs, and adding-type integration was also commonly found when cortical activation was taken as a response. This totally new finding nicely extends Functional Measurement to the field of neuroscience.

In the second paper, entitled “Do faces and body postures integrate similarly for distinct emotions, kinds of emotion, and judgment dimensions?”, Ana Duarte Silva (University of Coimbra) and her colleague examined the rules people use to integrate facial and bodily

information in judgments of intensity, valence, and arousal for expressions of basic and self-conscious emotions. They showed that, with the exception of arousal judgments, averaging was the predominant integration rule. Relative importance of face and body was found to vary as a function of judgment dimension, specific emotions and, for judgments of arousal only, type of emotion (basic versus self-conscious).

## Intuitive Physics

In a paper entitled “The weight of light”, Sergio Masin (University of Padova) examined whether the knowledge of Archimedes’ law of the lever can be used to measure subjective intensities. Participants were presented with two achromatic rectangles on a horizontal line-drawn lever, one on the left (with fixed low luminance) and one on the right of the fulcrum. For different combinations of luminance and distance of the right rectangle, participants were asked to position the left rectangle at a distance from the fulcrum such that the weight of the light emitted by the left rectangle kept the lever horizontal given the weight of the light emitted by the right rectangle. Most of the participants solved the task in accordance with their knowledge of Archimedes’ law. This finding suggests that people’s explicit or implicit knowledge of ratios and proportions in Archimedes’ law of the lever, and perhaps in other physical laws, could potentially be used to measure any subjective intensity on a ratio scale.

## Economic Psychology

In the first paper of this section, a paper entitled “Comparing adults and adolescents regarding the scope insensitivity of value curves: A functional measurement approach”, Ricardo Viegas (University of Coimbra) and his colleagues tested, using a sample of adolescents and a sample of adults, predictions regarding the curvature of the utility function derived from Hsee and Rottenstreich (2004) and according to whom, (a) evaluating hedonic targets results

in more curved (scope-insensitive) functions than evaluating instrumental/utilitarian targets, and (b) more affect-oriented subjects exhibit more pronounced curvatures than deliberation-oriented subjects. The prediction of larger curvatures and larger loss aversion in hedonic tasks than in non-hedonic tasks was supported by the data. There was neither increment in scope insensitivity nor larger values of loss aversion in adults than in adolescents. Non-negligible proportions of gain-seeking participants were found in both the adults' and the adolescents' samples, hardly suitable with a view of loss aversion as a psychophysical mandatory component of value curves.

In the second paper, entitled "Information trading in terms of brokers' functional cognition: An exploratory single participant experimentation", Ronit Laskov-Peled (Ashkelon Academic College) and his colleague presented the results of two single-subject experiments in which the participant—a senior broker—was asked to assess the probability that another, younger broker would take a risky financial decision based on cost-benefit and experience-anticipation information (Experiment 1) or on long term distress, anticipation, and experience information (Experiment 2).

## **Sport and Exercise Psychology**

In a paper entitled "Mapping handball players' reactions to aggression during a sporting event", Eric Fruchart (University of Artois) and his colleague, considering that during sporting events players' reactions to opponents' aggression vary in widely different ways, examined whether it was possible to find empirical support for them. Three qualitatively different ways to react to aggressive behavior during sport events were found: Self-Control (characterizing players whose level of anger increases as a function of the severity of aggression but never translates into avenging acts), Depends on Circumstances (characterizing players whose level of anger and desire to

retaliate quickly escalate as a function of number of assaults), and High Reactivity (characterizing players whose level of anger and resulting desire to avenge were immediately triggered by a single verbal assault).

## **Moral Science**

In the first paper in this section, a paper entitled "Information integration of Kohlbergian thoughts about consensual sex", Wilfried Hommers (University of Würzburg) and his colleague, tested the discreteness of Kohlbergian stages of moral development and the information integration of Kohlbergian content in cases of illegal but consensual sex between two juveniles. They found additional support for the idea that more than one Kohlbergian stage may be operative at any time, and for the averaging model of information integration. They suggest that stage theories need information integration theory to study the neglected problems of cross-stage and within-stage moral information integration.

In the second paper, entitled "Blame attribution among people with Developmental Disability", Guadalupe Elizabeth Morales (National University of Mexico) and her colleague, synthesized the main findings from two studies that examined moral judgement abilities in people with autism and in people with Down syndrome. They showed that adolescents and adults with autism or with Down syndrome were, practically to the same extent as controls, able to take into account information on the intent and consequences of harmful acts for attributing blame.

In the third paper in this section, entitled "Mapping French people's views on chemical castration of child and adolescent sex offenders", Hassen Sedkaoui (Jean-Jaurès University or Toulouse) and his colleague explored lay people's and physicians' views regarding the acceptability of chemical castration in cases of pedophilia. They found that participants' judgments of acceptability of this procedure were, on the average, very high. More than two

out of three participants considered that chemical castration was fully justified in all cases of pedophilia. Only a small minority considered that first time offenders of young adolescents, without psychiatric antecedents, should not be chemically castrated. Implications for bioethics are discussed.

## **Political Psychology**

In the first paper of this section, a paper entitled “Worth the risk? Emotional and behavioral responses to terrorism threat”, David J. Weiss (California State University, Los Angeles) and his many colleagues, reported the findings from two bi-national experiments regarding emotional and behavioral responses to a terrorist plot against commercial flights, examining both feelings and projected action. They found that fear and flight plans were not differentially affected by governmental response or social norm, although women expressed more fear than men. Most respondents would not change a planned flight to attend a close friend’s wedding or important job interview, but a substantial number would postpone a vacation or drive to a different location. Escalating attacks, however, increased fear and more participants canceled trips. Responses were similar across countries despite national differences in direct experience with terrorism.

In the second paper, entitled “Empathy as a foot in the inter-ethnic door: Facilitation of Positive Bilateral Perception among Jewish and Arab students in Israel”, Limor Yehuda (Western Galilee College) and her colleague reported the results from an exploratory experimental attempt to examine the viability of empathy as a means to facilitate a positive shift in functional cognitive schemata of helping. Experimental sessions included a conversation where the experimenter approached the participant empathetically for approximately twenty minutes and asked her to imagine a series of meetings between two female students (Jews and Arabs in all combinations) where one such protagonist attempts to receive from the other (Jew or Arab) lesson notes. Serial

exposure to empathy positively affected Jewish students.

In a paper entitled “Functional measurement in the field of Ethics in Politics”, Etienne Mullet (Institute of Advanced Studies, EPHE, Paris) and his many colleagues, presented, in a synthetic way, some of the main findings from ten studies they have conducted in the field of ethics in politics. These studies were about (a) Angolan and Mozambican people’s views about the legitimacy of military-humanitarian interventions; (b) French people’s perspectives regarding the government’s responsibility for the health of consumers of illicit substances; (c) Togolese people’s views about the acceptability of political amnesties in a time of political transition; (d) the perspective of victims of the genocide of the Tutsis in Rwanda regarding the attribution of guilt by association to offspring of perpetrators; (e) slave descendants’ views of the acceptability of national policies on reparations for slavery; (f) Colombian people’s willingness to forgive perpetrators of violence who harmed family members during the civil war; (g) the attitudes of French and Colombian people about national drug control policies; (h) Indian students’ views about the appropriateness of the death penalty for murder or rape; (i) Colombian people’s perspectives regarding corruption; and finally (j) Venezuelan people’s conceptualization of human rights. The main findings are discussed in reference to six of the foundations of Jonathan Haidt’s Moral Foundations Theory.

## **Sixth Biennial International Conference on Information Integration Theory and Functional Measurement**

The sixth conference will be held in Montreal (University of Quebec at Montreal, TelUQ) in response to Prof. Lonzozou Kpanake’s invitation. The proceedings of the previous IIT/FM conferences (Padova 2007, Brussels 2009, San Diego 2011, and Coimbra 2013).

## References

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