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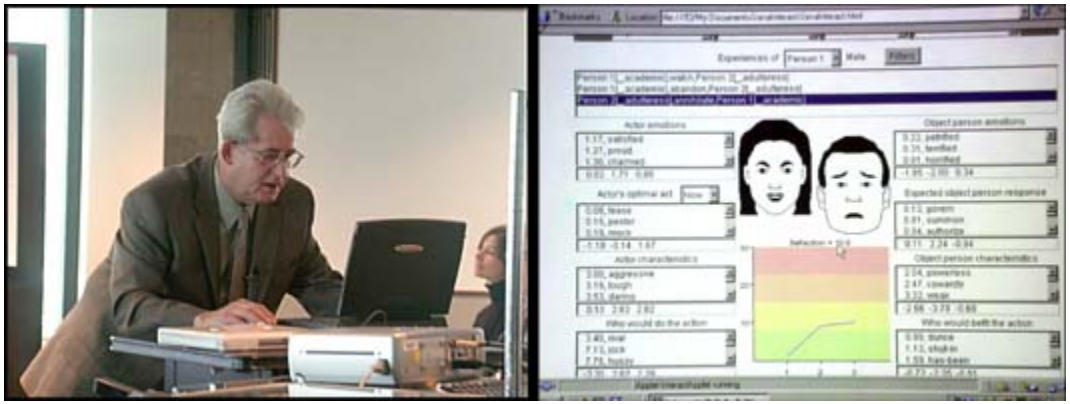
Symbolic Interaction and Knowledge Presentation: from cognitive to affective models



Conference Presentation Video

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Keynote Address

When last October I was asked to give a keynote address at this conference, the old aphorism - "Fools rush in where angels fear to tread" immediately came to mind. After all, what did I know about the field of information design? What would I have to offer to practitioners in this field? Why would they be interested in affect control theory, the area of social psychology in which I work? However, a lengthy telephone conversation with Peter Storkerson and Elka Kazmierczak, and correspondence with them gave me a shotgun introduction to the field of Information Design and showed me the relevance of affect control theory to information designers and design educators. If, as they suggest, information design is "a construction of socially bound interaction via symbolic means," then affect control theory should be relevant to information designers. This is because the theory deals with social interaction as symbolic interaction and as a construction of cognitive and affective processes. Moreover, it offers a methodology for empirical research and a mathematical model and computer program for simulating social interaction or, as I address

later, interaction between a single actor and an inanimate object as well. Peter and Elka suggested that the most important thing for me to do is to open the door to our perspective in social psychology, both conceptually and operationally, leaving it to you to make the relevant connections and inferential leaps. To return to the above aphorism, if their reassurance has not elevated me to the status of an "angel," as evidenced by my presence here today, it has at least made me feel like a more knowledgeable "fool."

I begin this address with a concise summary of the social psychology of George Herbert Mead, the intellectual exemplar of symbolic interactionism in contemporary social psychology. The cognitive, rational perspective of Mead and symbolic interactionism provides the background for introducing affect control theory. Although the theory has its roots in symbolic interactionism in sociological social psychology, it differs in two important ways. First, while symbolic interactionism has been widely criticized for failing to operationalize its major concepts and propositions, affect control theory is a conceptual and mathematical formalization of symbolic interactionism (MacKinnon 1994). Second, while symbolic interactionism has been criticized for ignoring emotion, affect control theory focuses on the affective meaning of objects and the construction of social interaction through affective reaction and control. At strategic points in my concise summary of the theory, I will illustrate its procedures for measuring the affective meaning of objects and its computer program for simulating social interaction.

Mead's Cognitive Social Psychology

In order to develop a genuinely social psychology, one that could deal with human intersubjectivity and social interaction without disintegrating into individual psychology, George Herbert Mead searched for a universal, objective principle that transcends individual mind and consciousness. He found this principle in language. For Mead, an individual escapes the boundaries of individual consciousness when, through communication, he or she finds that others share the same world. The universal, objective nature of language lies in the symmetry of response that significant symbols or words arouse in symbol-user and recipient. As Mead has forcefully put it, "a person who is saying something is saying to himself what he says to others; otherwise, he does not know what he is talking about" (1934: 146-147). To cite a dramatic example, shouting "fire" in a crowded theater creates a shared cognition and a behavioral disposition to flee in the person announcing the danger and those hearing the warning. Thus, significant symbols are universals of discourse, creating common objects of consciousness (ideas or concepts) and predispositions to act in people speaking the same language, and these social cognitions are the basis of human intersubjectivity and social interaction. In short, by establishing his social psychology on the bedrock of language, Mead hoped to buttress it against the dangers of solipsism that haunted other contemporaneous attempts to develop a truly social psychology.

Unfortunately, Mead restricted the natural, social function of language to cognitive communication, because in his view emotional expression lacks the symmetry of response characteristic of cognitive communication. For example, one person's expression of anger might induce fear rather than anger in another. Although he acknowledged that language can sometimes arouse the same emotions in self and others, as in poetry or the theater, he argued that generally "we do not deliberately feel the emotions which we arouse [in others]. We do not normally use language stimuli to call out in ourselves the emotional response which we are calling out in others ... as we do in the case of significant [cognitive] communication" (1934: 148). Because of his view on the asymmetrical nature of emotional communication, Mead relegated emotion to individual subjective experience. As a

consequence, there cannot be a social psychology of emotion and emotional communication so long as one remains within the cognitive conceptual framework of Mead.

Mead's cognitive view of language had serious implications for his interrelated concepts of mind, consciousness, self, and social interaction. Because he defined mind as an "internalized or implicit conversation of the individual with himself' (1934: 47), while restricting the natural function of language to cognitive communication, he was compelled to define mind in exclusively cognitive terms as well. In effect, the human mind, at least that part of which is social, becomes coextensive with cognitive processing; and human consciousness becomes coextensive with reflective consciousness, the cognitive awareness of meaning. Emotion is relegated to a second kind of consciousness, a residual category associated with bodily sensations and other subjective experiences. In short, the kind of consciousness wherein cognition dwells is social and objective; that wherein emotion dwells is individual and subjective. Like mind and consciousness, Mead defines the self in strictly cognitive terms. In his words, "selfconsciousness, rather than affective experience... provides the core and primary structure of the self, which is thus essentially a cognitive rather than an emotional phenomenon" (1934: 173). By implication, social interaction becomes cognitive, symbolic communication between individual selves sterilized of affect. Again, one cannot develop a social psychology of emotion and emotional communication within Mead's cognitive framework.

Despite his cognitive bias, Mead's identification of language as the universal objective principle upon which to build a social psychology remains one of his greatest contributions. A second major contribution to social psychology is his conceptualization of human behavior as a process of cybernetic feedback and control. Indeed, Mead's articulation of this idea foreshadowed the development of modern systems theory by several decades. For Mead, the human capacity for reflexiveness - "the turning back of the experience of the individual upon himself' (1934: 134) - is the defining feature of the human mind and consciousness. By drawing upon the reflexive nature of mind and consciousness, Mead was able to explain purposive human behavior without resorting to the mysticism of teleology and final causes. That is, human goals are realized through successive adjustment of behavior in response to the negative feedback of the mind's anticipatory states, drawing one closer and closer to a desired goal - analogous to modem mechanical systems such as a thermostat or guided missile.

For Mead, however, this cybernetic control model of human behavior is strictly cognitive. As a consequence, his exclusion of affect from human purposive behavior leaves unanswered the question of what motivates the individual to initiate goal-oriented or purposive behavior in the first place, and to sustain such behavior until a goal is realized. The fact of the matter is that human motivation consists of two components: first, the energization of behavior; second, its direction. While Mead's cognitive control model accounts for the direction of behavior, it cannot account for its energization. That is, objects or goals must be desired or wanted, invested with affective significance, before they energize and mobilize behavior. By extension, Mead's cognitive control model also fails to explain the motivational basis of social interaction.

We turn now to affect control theory. As we shall see, affect control theory accepts Mead's focus on language and cybernetic control, but extends his cognitive social psychology into the realm of affect and emotions.

Affect Control Theory

Affect control theory (Heise 1979; Smith-Lovin and Heise 1988; MacKinnon and Heise 1993;

MacKinnon 1994) was initiated by David Heise, Indiana University, in the late 1970s, and developed since then in collaboration with Lynn Smith-Lovin (University of Arizona), Herman Smith (University of Missouri), and myself, along with second and third generations of younger researchers. Affect control theory formalizes Mead's (1934) model of mind as an internal process of cybernetic feedback and control, and his conceptualization of social interaction as an ongoing process of mutually adjusted response among interactants (MacKinnon 1994). In addition, the theory accepts Mead's premise that language creates shared objects of consciousness through social categorization, and that these social cognitions are the basis of intersubjectivity and coordination in social interaction. However, contrary to Mead's view that emotion is individual or idiosyncratic rather than social, affect control theory views the affective associations of cognitions as more or less shared by members of the same culture or subculture. Moreover, the theory recognizes that people communicate their emotional experiences to one another through emotion-displays and narratives, evoking (at least potentially) a symmetry of response between sender and receiver that is the essence of cognitive communication according to Mead. In other words, affect control theory maintains that emotional communication, like cognitive communication, is social. Cultural sentiments rather than social cognitions provide the data for affect control theory; and, in contrast to Mead's cognitive social psychology, the theory begins with affective rather than cognitive processing.

Because "affective associations to social categorization generally are recognized as 'attitudes,' " (Heise 1979: 179n1), affect control theory draws heavily upon attitude theory and research for insights into affective processing. In this regard, the theory measures cultural sentiments by capitalizing on the EPA (evaluation, potency, activity) structure of meaning established by the psychologist, Charles Osgood, and his associates (Osgood, Suci, and Tannenbaum 1957; Osgood, May, and Miron 1975). According to Osgood, EPA captures the connotative aspect of meaning, "the 'feeling tones' of concepts as part of their total meaning" (1969:195). Evaluation and potency, respectively, have been identified with the sociological dimensions of status and power (Kemper and Collins 1990); and, depending upon context, activity has been associated with the emotional energies of actors (Collins 1990), the expressiveness of identities and roles (Heise 1988:6), or the agency of participants in social interaction.

Affect control theory measures the affective meaning of social identities, interpersonal behavior, and other concepts with three scales. The evaluation scale is anchored by "bad, awful" to "good, nice"; the potency scale, by "small, weak, powerless" to "big, strong, powerful"; and the activity scale, by "slow, old, quiet" to "fast, young, noisy." Calibrated from -4 to +4, each scale captures a wide range of negative to positive valence, from infinitely "bad, awful" to infinitely "good, nice," for example. Actual values generally fall between ±3, with a ±2 considered a large (positive or negative) value. In affect control research, individual scores on EPA scales are aggregated to estimate the cultural sentiments of concepts. In more recent years, we have moved from paper and pencil to electronic collection of EPA data, employing Program Attitude designed for this purpose, and more recently still, to collecting data via the Internet (Heise 2001). Examples of mean EPA ratings for various concepts are illustrated in Figure 1. EPA measurement has been used successfully to study the underlying meaning of occupational prestige scores (MacKinnon and Langford 1994); gendered traits (Langford and MacKinnon 2000), and intergroup relations (MacKinnon and Bowlby 2000).

Figure 1: Examples of the EPA Measurements of Social Concepts

IDENTITIES

U.S. Male Cultural Sentiments (EPA)

	E	P	A
	2.00	2.00	2.00
• myself (Indiana University 1994)	2.48	1.74	1.83
• winner	2.48	1.74	1.83
• athlete	1.54	2.15	2.04
• champion	1.43	2.57	2.04
• superstar	1.12	2.25	1.84
• brain	1.79	1.83	1.04

	E	P	A
	-2.00	-2.00	-2.00
• zombie	-1.81	-1.95	-1.80
• wino	-1.54	-2.27	-1.54
• loafer	-1.55	-1.82	-1.29
• beggar	-1.15	-2.19	-1.29

U.S. Female Cultural Sentiments (EPA)

	E	P	A
	2.00	2.00	2.00
• fireman	2.19	1.89	1.54
• boyfriend	2.34	1.62	1.68
• heroine	1.58	1.76	1.55
• hero	2.16	2.42	1.13
• I, myself (Indiana University 1994)			

	E	P	A
	-2.00	-2.00	-2.00
• coward	-1.30	-1.97	-1.13
• wino	-1.41	-1.80	-1.05
• deadbeat	-1.48	-1.78	-0.96
• beggar	-0.76	-2.06	-1.47

BEHAVIORS

U.S. Male Cultural Sentiments (EPA)

	E	P	A
	2.00	2.00	2.00
• cheer	1.97	1.71	1.51
• sleep with	1.69	1.62	1.63
• thrill	1.68	1.51	1.75
• make love to	2.65	1.47	1.61

	E	P	A
	-2.00	-2.00	-2.00
• submit to	-.76	-.99	-.53
• beg	-1.13	-1.05	-.18
• forget	-1.47	-.46	-.18
• ignore	-1.53	-.20	-.19

U.S. Female Cultural Sentiments (EPA)

	E	P	A
	2.00	2.00	2.00
• dance with	1.80	1.25	1.66
• delight	2.44	1.74	1.25
• rescue	2.41	1.76	1.22

	E	P	A
	-2.00	-2.00	-2.00
• beg	-1.17	-.93	-0.36
• fear	-1.47	-.17	-0.16
• misjudge	-1.26	-.15	-0.09
• forget	-1.23	-.40	0.18

MODIFIERS (traits, status characteristics, emotions)

U.S. Male Cultural Sentiments (EPA)

	E	P	A
	2.00	2.00	2.00
• industrious	1.98	1.74	1.89
• brave	2,19	1,70	1.83
• popular	1.53	1.62	1.64
• sexy	1.83	1.27	1.86
• strong	1.52	1.65	1.52
• creative	2.02	1.65	1.31

	E	P	A
	-2.00	-2.00	-2.00
• dull	-1.29	-1.43	-1.89
• impotent	-1.80	-1,79	-1.19
• lazy	-1.74	-1.70	-1.19
• unhealthy	-1.56	-1.44	-1.19
• lonely	-1.84	-1.38	-1.12
• bored	-1.72	-1.22	-1.27

U.S. Female Cultural Sentiments (EPA)

	E	P	A
	2.00	2.00	2.00
• outgoing	1.61	1.48	1.75
• active	1.62	1.43	2.18
• ambitious	1.33	1.63	1.61
• talented	2.21	1.73	1.15
• enthusiastic	1.54	1.19	1.90
• aroused	1.49	1.22	1.74
• vivacious	1.54	1.23	2.41

	E	P	A
	-2.00	-2.00	-2.00
• uneducated	-1.70	-1.95	-1.05
• boring	-1.74	-1.52	-1.32
• narrow minded	-1.74	-1.66	-0.87
• helpless	-1.26	-2.08	-1.00
• pitiful	-1.18	-1.51	-1.15
• unhealthy	-1.33	-1.42	-0.98

SETTINGS (places & events)

U.S. Male Cultural Sentiments (EPA)

	E	P	A
	2.00	2.00	2.00
• ball game	1.97	1.46	1.65
• celebration	2.45	1.56	2.16
• fire station	1.96	1.96	1.35
• campus	1.84	1.32	1.73
• football stadium	1.38	1.56	1.81
• New Year’s Eve	1.84	1.21	2.27

	E	P	A
	-2.00	-2.00	-2.00
• poorhouse	-1.58	-1.43	-1.12

U.S. Female Cultural Sentiments (EPA)

	E	P	A
	2.00	2.00	2.00
• football stadium	1.65	1.84	2.15
• college	2.15	2.39	1.82
• ambulance	1.54	1.76	1.94
• ball game	1.72	1.53	2.00
• pep rally	1.97	1.61	2.40
• car	1.67	2.21	1.56

	E	P	A
	-2.00	-2.00	-2.00
• poorhouse	-1.28	-1.12	-1.57

• shanty	-1.15	-1.35	-1.28	• flophouse	-0.91	-0.68	-0.69
• skid row	-1.86	-1.00	-1.93	• funeral	-1.08	-0.10	-1.52
• tenement	-1.06	-0.99	-0.70	• morgue	-1.01	-0.05	-1.85
• mortuary	-1.37	-0.14	-2.23	• shanty	-0.69	-0.69	-0.57

The EPA structure of connotative, affective meaning enables one to get a quantitative handle on the dimensional complexity and indeterminable content of denotative, cognitive meaning.

While situation definitions and other cognitive processes are the framework for social interaction, social dynamics are largely governed by an affective system relating to values, motives, emotions, etc. Classifications of places, people, objects and behaviors get transformed into a domain of feelings where things lose their qualitative uniqueness, become comparable to one another, and begin obeying quantitative principles. This is analogous to observing that Sun, Earth, Mars, Saturn, etc., are identifiable by their unique characteristics, but the dynamics of the solar system are governed by the distances, masses, and velocities of these bodies and the operation of physical laws (Heise 1988:6).

To employ a mundane example, the denotative, cognitive meaning of a chair includes its material, color, function, style, country of manufacture, price, quality, endurance, and perhaps many other qualities, but the connotative, affective meaning of a chair can be captured on three simple dimensions - evaluation, potency, and activity; and qualitatively different kinds of chairs - indeed chairs and other kinds of furniture - can be compared in the same affective space. Moreover, the interaction between a person and a chair - as one-sided and seemingly trivial as this may seem - is largely governed by affective rather than cognitive dynamics. Because EPA ratings serve as generalized attitude scales (Osgood et al. 1957: 195-198), they allow one to measure all kinds of social objects - social identities, interpersonal behaviors, social settings, social characteristics, personality traits, and emotions - on a single, common metric. So too for physical and inanimate objects such as a chair, a car, or whatever. Moreover, EPA scales provide a mathematically coherent metric (Heise 1979: 50), enabling one to transform one type of phenomenon into another within the same semantic space. This is accomplished in affect control theory by applying various affect control models. For example, given the EPA profiles for the identities of people in a social situation, one model generates culturally-expected behaviors for their interaction. Another model simulates labeling and trait attributions that take place when the actions of participants belie culturally expected behavior. A third model generates the emotions produced by interactional events, and so on. Although these various models were developed to simulate social interaction, one can easily conceive of extending them to the interaction of a person with an inanimate object such as a chair or a car.

At the heart of these various models lie the principles of affective reaction and affect control. The first principle proposes that people react affectively to interactional events, experiencing transient feelings for the actor, behavior, and object-person in each event. The second principle proposes that people construct and interpret events to confirm cultural sentiments for these event components. The discrepancy between established cultural sentiments and the transient feelings produced by events is called affective deflection in affect control theory, which can be viewed as a kind of global affective response to interpersonal events, employing fundamental cultural sentiments as a point of reference. Restating the affect control principle in these terms, affect control theory proposes that

people construct and interpret interactional events to minimize affective deflection. The concept of deflection and its operational definition is illustrated in Figure 2.

Figure 2: The Concept of Deflection

Conceptually, affective deflection can be defined as the discrepancy between fundamental or culturally established sentiments and the transient impressions or feelings produced by events. Affective Deflection = (fundamental, cultural sentiments - transient, current feelings)Operationally, deflection is measured as the sum of the squared discrepancies between fundamental sentiments and transient impressions for the ABO (Actor-Behavior-Object) components of events on the EPA (evaluation, potency, and activity) dimensions of affective meaning:

Unprimed terms in this expression denote fundamental cultural sentiments; primed terms, transient impressions created by events. Subscripts (e, p, a) denote evaluation, potency, and activity. Employing squared discrepancies avoids the cumbersome algebra of absolute differences and provides greater weight to larger discrepancies than to trivial ones. If a setting (S) is specified, the above expression for ABO events is expanded to accommodate ABOS events.

The *fundamental sentiments* in the deflection measure are simply the mean EPA values of identities and behaviors measured on the semantic differential scales illustrated above (Figure1).

The *transient impressions* or *feelings* created by events are generated from the empirically-based impression formation equations of affect control theory. Because these equations are far too complex to discuss here, we refer the interested reader to Heise (1988) for technical detail.

It is the affective deflection to events that is "controlled" in affect control theory, and affect control is the basic motivational principle of the theory. Since minimizing affective deflection is equivalent to confirming the fundamental sentiments for the situational identities of self and other in social interaction, the motivational principle of affect control boils down to the incentive of identity-confirmation. That is, people act to confirm the affective meaning of the situational identities of self and other in social interaction.

As illustrated in Figure 3, the overall operation of the affect control model can be summarized in six steps [adapted with revisions from }{Heise (1979: 3)]. (For a formal propositional statement and verbal exposition of the theory, see MacKinnon 1994; for a more technical, mathematical account, see Heise 1988.)

Figure 3: Summary of the Affect Control Model

1. Each person present in a situation (as actor, object person, or observer) engages in cognitive work to define the situation at hand, employing social categories (identities) to identify people present. Because social identities are associated cognitively with characteristic acts (e.g., counsel and medicate for doctor; listen and obey for patient), additional cognitive work enables one to narrow down the potential actions of each person. At the same time, the social categories identified by all this cognitive activity evoke cultural sentiments for the imputed identities and likely behaviors of people present.
2. Events that are judged to be comprehensible within the definition of the situation and additional cognitive work are tentatively selected for recognition. Events that come closest to confirming cultural sentiments for the identities and behaviors are more likely to be selected for final recognition than other possible events.
3. The recognition of events generates transient impressions or feelings about participants that may confirm or disconfirm cultural sentiments for their imputed identities and perceived behaviors.
4. Discrepancies between transient feelings and established cultural sentiments (i.e., affective
deflection) engender the conceptualization of new events that would bring transient feelings back into line with cultural sentiments. If self is the actor in such conceptualized events, a behavioral intention or disposition is the outcome of this process; if another participant is the actor, an expectation for that person's behavior.
5. The realization of a behavioral intention or expectation through action creates a new event, looping the process back to (2).
6. If cultural sentiments for the identities of participants cannot be confirmed through restorative action (5), the process loops back to (1) instead, and a person engages in a redefinition of the situation on the basis of the most recent event. This higher-order feedback helps to stabilize the system. In view of the greater observability and/or finality of behavior, a redefinition of the situation generally focuses on reidentifying participants (MacKinnon 1994: 24). This is accomplished by imputing new identities (labeling) or modifying the original identities through the attribution of explanatory traits.

The summary outline illustrated in Figure 3 makes explicit three essential features of affect control theory. First, the theory specifies the relations among cognition, affect, and behavior,

not as a simple causal chain, but rather as a cybernetic control system in which people actively engage in maintaining their experience of social reality through corrective action or through reconceptualization of what has taken place. In contrast to Mead, however, the theory applies the principle of control to affective (attitudinal) rather than cognitive (information) processing.

Second, the theory views the relation between cognitive and affective processes as complementary and interdependent phases of human consciousness. That is, the theory supposes that present cognitions of interactional events evoke affective reaction and control which, in turn, stimulate new cognitions - the conceptualization of restorative events (see Step 4), for instance, or the reconceptualization of those that have been previously recognized (see Step 6).

Third, the theory acknowledges that attitude-behavior dynamics are "subordinate to a definition of the situation - that is, to a person's categorizations of people and objects in a scene" (Heise 1979: 2). The theory does not predict the initial definition of the situation (Step 1), only its modification (see Step 6). The original definition of the situation is provided by the researcher conducting affect control simulations of social interaction. In short, affect control theory begins with the affective associations or attitudes evoked by social categories, and models the attitude behavior dynamics that follow.

Absent from the summary outline of affect control theory just provided is the theory's model of emotions. In this regard, affect control theory distinguishes between the global affects of cultural sentiments, transient feelings, and deflection, on the one hand, and the specific emotions (happiness, sadness, and so on), on the other. Derivations from the empirically-based attribution equations of the theory reveal that the specific emotions are a consequence of two factors: first, the amount of affective deflection produced by events; and, second, the extent to which events confirm or disconfirm the situational identities of participants (MacKinnon and Heise 1993; MacKinnon 1994; Smith-Lovin 1990).

Conclusion

In conclusion, I have attempted to provide a concise but comprehensive overview of affect control theory in a very limited time. For those who wish more information, including cultural data sets, models, computer programs, and publications, visit the excellent web site developed and maintained by David Heise (http://ezinfo.ucs.indiana.ediiLheise/home.htrnl). I believe that affect control theory has both conceptual and operational relevancies for information design. On the conceptual front, the focus of affect control theory on affective meaning and processes squares with the recognition by some information designers that the affective meaning of and reaction to a message may be as important as its cognitive content. If so, then anticipating the affective reactions of intended receivers becomes essential to ensure that an information designed message does not get deflected away from the cognitive content it seeks to convey. On the operational front, the theory's methodology for measuring the affective meaning of social objects and its modeling of affective reaction and control in social interaction may be extended to the relation between people and inanimate objects - a product, an educational campaign to modify behavior or social relations, or whatever. If so, then simulations of the affective reaction to a message by a receiver can be carried out prior to its actual communication.

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