Disentangling the Holism of Intentional Systems From the Interactionism of Mechanistic Systems in Person-Oriented Research

Artur Nilsson

Department of Psychology, Lund University, Box 213, 221 00 Lund, Sweden

Email address:

Artur.Nilsson@psy.lu.se

Abstract: A key assumption in the person-oriented approach is that a person must be understood as a complex, integrated system, represented by patterns of within-person variation rather than scores on separate variables. The term 'system' does, however, have multiple meanings, which are not clearly distinguished in the person-oriented literature. I try to disentangle causal interactionism, which describes the psychological consequences and functions of each component of the system as dependent upon its causal interaction with other system components, from content holism, which describes the system components as in part constituted by their relations to each other and the system as a whole. Although the terms 'interactionism' and 'holism' are often treated as combinable and interchangeable, causal interactionism and content holism pertain to distinct kinds of research problems. Causal interactionism construes the person in terms of the hierarchically structured mechanistic systems that underpin his or her attributes and shape them over time, and can be exemplified in terms of Magnusson's developmental approach, whereas content holism is integral to our understanding of the person as an intentional system, whose mental states and actions are interweaved through principles of logic and rationality rather than material causality, and can be exemplified in terms of Stephenson's Q-methodological approach.

Keywords: Holism, interactionism, person-oriented, system, organism, mechanism, mind, intentional, idiographic, nomothetic, philosophy of psychology

Since the early 20th century, numerous prominent personality theorists (Allport, 1924; Magnusson, 1999; Mischel, 2004; Pervin, 2001; Stern, 1938) have argued that a person must be understood as a complex and integrated system, rather than an atomic set of disparate components. Mayer (2007) has even claimed that there is consensus today that personality should be defined as an organized system. Yet psychology is dominated by a variable-oriented approach that is ill-suited to the study of persons as total systems, because it does not take within-person relations between the parts of the person system into account. Person-oriented theorists argue that pattern-based methodologies, which focus on within-person patterns across variables, items, situations, or time points, are necessary for understanding the person as a whole.

A central linchpin of the person-oriented approach is that research methods should be tailored to the problem they are used to address. Person-oriented theorists aspire toward providing "a general framework for problem formulation, research strategy and methodology, and for interpreting findings" (Bergman & Lundh, 2015, p. 3). But in order to develop such a framework, it is necessary to disentangle the different senses in which the person can be understood as a 'system'. At least two distinct notions of system can be discerned in the person-oriented literature. The components of *mechanistic systems* are interwoven by virtue of *causal interactionism*, with which I mean that the psychological consequences and functions of each system component are dependent upon its causal interaction with other system components. The components of *intentional systems* are interwoven by virtue of *content holism*, with which I mean that the system components are partly constituted by their relations to each other and the system as a whole, because they are organized by principles of logic and rationality

rather than material causality[1]. The difference between these ways of construing the person as a system is fundamental. While intentional systems do, strictly speaking, not have separate parts that can be divorced from the system they are embedded within, mechanistic systems must have separate parts in order for these parts to be able to interact causally, because, as famously noted by Hume (1978/1738), material causality is a contingent relation holding between independent existents; a given relation between system components cannot at once be both a constitutive, logical relation and a contingent, causal relation.

The contrast between mechanistic and intentional systems is, however, obscured by the fact that the terms 'interactionism' and 'holism' are frequently treated as combinable, or even interchangeable, in the person-oriented literature. This is perhaps most evident in Magnusson's (1999) "holistic-interactionistic" approach. Magnusson's holism incorporates the assumption that "each single datum for individual A derives its psychological meaning from its place in a pattern of data for the same individual" (Magnusson, 1999, p. 236) and that "only the integrated individual, not single variables, remains distinct and identifiable across time" (Magnusson, 2001, p. 155). But when he explains this more closely, it becomes clear that he is advocating what might be called *functional holism*, which is more modest than content holism, portraying the *psychological consequences and functions* of each system component, rather than the identity of the component as a whole, as determined by its role in the system – each part "takes on meaning from its role in the total functioning of the individual" (Magnusson, 1999, p. 239), and "developmental processes are irreducible and indivisible" due to "functional interaction" (Magnusson, 2001, p. 155).

Although causal interactionism is readily combinable with functional holism, and perhaps with other notions of holism that I will not address here, it is not combinable with content holism. A particular description of a system, and a concomitant research problem and person-oriented analysis, cannot simultaneously invoke both content holism and causal interactionism. Rather, these two ways of describing systems give rise to different kinds of research problems and interpretations of the patterns that are investigated. Causal interactionism enables in-depth studies of how complex systems of causal factors mold the person over time, whereas content holism enables in-depth studies of the constitution of the person construed as an intentional system, whose mental states and actions are interweaved by virtue of logic and rationality rather than material causality. Causal interactionism and content holism are both indispensable for the study of persons. They are, I will argue, compatible in the sense that they unveil and illuminate dif-

ferent kinds of properties of the very same person, rather than applying to different kinds of substances or entities. But they operate at different levels of description and can therefore not be coherently combined within the same description of a system.

In order to clarify the differences between the causal interactionism of mechanistic systems and the content holism of intentional systems, I will seek to elucidate their philosophical basis, drawing on contemporary philosophy of explanation and philosophy of mind, and exemplifying them in terms of Magnusson's (1999) developmental approach and Stephenson's (1953) Q-methodological study of subjectivity, respectively. I conclude with a discussion of their compatibility.

The causal interactionism of mechanistic systems

Philosophical basis

During much of the 20th century, philosophers of science treated physics as an ideal for all scientific inquiry. Scientific explanation was modeled upon the laws of physics, which identify regular successions of events. In Hempel and Oppenheim's (1948) influential statement of the Deductive-Nomological account, an explanation is an argument in which the observation statement that is to be explained is deduced from, and thereby explained in terms of, the assumption that a particular law exists and its initial conditions were satisfied; the singular event is, in this sense, *covered* by the law. Given that the law exists, the observed event *had to* occur, which explains why it, de facto, *did* occur. Hempel and Oppenheim also introduced a statistical-inductive version of this account which was applied to probabilistic regularities. But due to counter examples launched at their formalization, proponents of the nomological account of explanation subsequently came to see identification of the causal mechanisms that produce regularities, rather than just the regularities per se, as crucial for explanation. For example, the height of a flagpole might as well, on the Hempel-Oppenheim account, be explained in terms of the length of its shadow as the other way around, although it appears to be the length of the flagpole that causes, and thereby explains, the length of the shadow. Proponents of nomological explanation today therefore accept that nomological explanations typically have a clear causal directionality, incorporating independent and dependent variables rather than mere correlation (Salmon, 1990).

There was, however, still another problem with the nomological account of explanation. In the post-Kuhnian theory of science, which involved scholars from many fields studying what actual scientific work is like, there was an increased appreciation of the difficulty of fitting explanatory activities in other fields than physics into the classical nomological account, and a more pluralistic view of explanation started to gain traction (Godfrey-Smith, 2003). Even

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[1] I use 'material causality' as a general umbrella term for all forms of causation that involve material structures or processes (i.e. including 'efficient causes').

biology turned out to be difficult to fit into the nomological scheme, in spite of the fact that it is a natural science, because living biological beings are complex, dynamic, functionally, and hierarchically organized wholes that adapt to their current environment, and are therefore difficult to decompose into a set of isolated events or properties (i.e. variables) and concomitant causal mechanisms.

For example, the human body contains many different organ systems, such as the cardiovascular system, the immune system, the respiratory system, the nervous system, the endocrine system, and so on. The orchestrated functioning of these systems has been tailored by millions of years of evolution to promote survival and reproduction (e.g. oxygenation of the blood depends upon the cardiovascular and respiratory systems and enables respiration and muscular activity). Each organ system can be further divided into subsystems, and these can, in turn, be further divided into subsystems; for example, the cardiovascular system can be decomposed into the orchestrated functioning of the heart, veins, arteries, capillaries, and so on. Each system is thus a complex causal mechanism producing a specific behavior that contributes to the total functioning of the organism through its interaction with other mechanisms (Bechtel & Wright, 2009; Glennan, 1996).

Critics have objected that such explanations will reduce to nomological explanations in the end, once the basic components that are really doing the causal work have been identified. But this type of reductionism leaves us unable to explain precisely the higher-level behaviors that emerge through the interaction of the components (Bechtel & Wright, 2009; Gervais & DeJong, 2012; Hayek, 1994/1967). Bechtel and Wright (2009) put this the following way:

> Mechanisms are often themselves a component part in yet a higher level mechanism and the regularities resulting from the organization and situatedness of that higher level mechanism constrain the activities of the initial component mechanism. Hence, the process of both decomposing *and* composing systemic structures and functions across various levels is a fundamental part of the mechanistic framework. Accordingly, while mechanistic explanations are in part reductionistic, they also accommodate the emergence of higher levels of organization and the need for autonomous inquiry into the regularities found among the denizens of these higher levels. (Bechtel & Wright, 2009, p. 127)

In other words, the effect and function of each system depends upon its interaction with the other systems and must be understood in terms of its role in higher-level systems, and, ultimately, in the total behavior and functioning of the organism. But unlike a system that is holistic in terms of content, the components of biological systems do exist independent of each other – indeed, today we are even able to transplant tissues and organs from one body to another – although there may be some indeterminacy about how to partition these components.

This type of mechanistic thinking forms an important part of contemporary psychological explanation. Psychological systems for perception, social interaction, emotion, and much else, are understood in terms of mechanisms crafted by evolution for helping our ancestors to navigate the environment, form social coalitions, raise children, avoid danger, defeat aggressors, and so on (Bechtel & Wright, 2009; Shapiro, 2010). Of course not all psychological causal systems can be explained in terms of adaptation. The renowned paleontologist Gould (1984, p. 67), for example, thought that "most of what our brain does today, most of what makes us so distinctively human (and flexible), arises as a consequence of the nonadaptive sequelae, not of the primary adaptation itself". But it is nevertheless useful to consider the interaction of different psychological systems and their *current* functioning, in producing the total behavior of the organism – and sometimes knowledge about the evolutionary history of a particular mechanism can help us understand its adaptive or maladaptive outcomes in a modern world.

The outlines of interactionism have, furthermore, long been present in person-oriented thought in psychology. Although Allport (1924, 1937) was originally inspired by the philosophical writings of Stern, he came to increasingly emphasize the biological explanatory perspective on human psychology toward the end of his career. Allport (1961) thought of personality as a dynamic, hierarchically structured, and functionally integrated psycho-physical system that covers everything from biochemical processes and brain capacity to philosophy of life and cultural background, interacts continually with the environment, and determines the individual's characteristic behavior and thought. Following in the footsteps of Stern and Allport, Magnusson later became the most articulate proponent of a modern interactionist perspective on persons.

Magnusson's interactionist study of development

Magnusson's (1992, 1995, 1999, 2001) brand of interactionism is firmly rooted in the biologically mechanistic paradigm of explanation, portraying a person as "an active and purposeful organism, functioning and developing as a total, integrated being" (Magnusson, 1999, p. 219). Like Allport (1961), Magnusson (1999) emphasizes the hierarchical structure and synchronized functioning of the subsystems making up the total person system, claiming that "at each level, the totality derives its characteristic features and properties from the interaction of the elements involved, not from the effect of each isolated part on the totality" (p. 229) and "each subsystem must be analyzed in terms of its role in the total functioning of the individual" (p. 234). He divides the subsystems broadly into: (1) the biological system, from the cellular level and up to the brain and the physiological system, (2) the mental system, including percep-

tions, cognitions, emotions, motives, needs, values, goals, and worldviews, and (3) the behavioral system, including concentration difficulties, underachievement, motor restlessness, hyperactivity, and aggressiveness. But he also emphasizes the role of the person's interaction with, and adaptation to, the environment in regulating the functioning of the subsystems, portraying the person system as "an active, purposeful part of an integrated, complex, dynamic, and adaptive person-environment system" (Magnusson, 1999, p. 219). One of his examples is that the effects of the onset of biological maturation on education level, job status, number of children, and so on, depend upon how maturation interacts with environmental demands, norms, and expectations, peer relations, and self-perceptions.

Magnusson is not opposed to the nomological approach per se. But he is critical of research that adheres to one monolithic methodology, inspired by the alluring ideals of Newtonian physics, regardless of the character of the research problem at hand. First, he argues that variable-oriented studies of relations between isolated variables in populations are ill-suited to the study of persons. Persons should, according to Magnusson, be studied with a person-oriented methodology that focuses on within-person patterns across variables, thus modeling the organization of the system under scrutiny and permitting generalizations to persons rather than variables; the interactions between system components and subsystems exist at the level of the individual and can therefore, Magnusson points out, not be adequately modeled through variable-oriented interaction terms.

Second, Magnusson (1992) argues that the celebration of hypothesis-testing as *the* ultimate method, and predictive power and statistical significance as *the* ultimate goals of all psychological research, entails the risk "that technically sophisticated, but irrelevant theories, sub-theories, and fragments of theories multiply and persist, yielding results of little importance for the solution of relevant problems and offering little or no knowledge of interest to people outside the group of researchers who defend or oppose the theory" (p. 3). Prediction is, Magnusson argues, seldom feasible when it comes to the development of individuals, which is a multi-determined, stochastic process, in which even small fluctuations in the initial properties of the system can lead to chaotic variations in its functioning; it is, according to him, often more illuminating to engage in careful, systematic observation, analysis, and explanation of the phenomena that do occur.

Third, Magnusson questions the assumption of linearity, which pervades statistical analyses in psychological research, arguing that the effects of variables, and their roles as independent or dependent variables, frequently vary across persons, systems, and time points, as a function of their interactions with other variables.

Magnusson therefore wants to replace the traditional nomological approach with a general, integrated model of persons and their environments that guides planning and implementation of studies on specific problems, interpretation and evaluation of their results, and coordination of research from many different disciplines, including molecular biology, developmental biology, physiology, genetics, neurosciences, social psychology, sociology, and anthropology. Within this framework, the role of person-oriented research is to investigate: "(1) distinctive configurations of operating factors, at different levels of the total hierarchical system, which characterize each individual's psychological processes in a current perspective, (2) how these change over time in the developmental process of individuals, and (3) the guiding mechanisms in the process of systems stability and change" (Magnusson, 1999, p. 236). The emphasis on understanding the person as a system is, Magnusson notes, in line with trends in other scientific disciplines that deal with complex, dynamic, non-linear processes, including biology, meteorology, and ecology.

Magnusson counters the critique that his framework is so broad and loose that it entails explanatory vacuity by making clear that he is not proposing that everything interacts with everything, that the entire person-environment system can, and should, be addressed in every study, or that interaction is a random, completely idiographic process. Rather, subsystems and their components interact in an organized way, guided by biological and psychological mechanisms, and there is lawful continuity in individual development, connecting the current system to its previous states. This means that there are always limited numbers of system configurations and developmental trajectories that are biologically and psychologically possible (Bergman & Magnusson, 1997; Magnusson, 1999; Magnusson & Törestad, 1993). The purpose of Magnusson's pattern-based methodology is precisely to identify these configurations and trajectories, by grouping the profiles of individuals that are homogeneous with respect to the system or its development, and elucidating prototypes that represent each configuration or trajectory. Recently, a variety of new and increasingly powerful statistical tools have been developed for these purposes (Bergman & Andersson, 2010; Bergman & Magnusson, 1996; Bergman & Trost, 2006; Sterba & Bauer, 2010).

It is, however, crucial to note that, in Magnusson's person-oriented approach, the system configurations and trajectories are represented by within-person patterns across scores *on variables*, modeling the system components and their organization. The variables must have independent contents that are fixed through prior operationalization, rather than emergent from analysis, in order for their referents to stand in causal relations with each other. The meaningfulness of the patterns will therefore depend upon the applicability of the selected variables to the system under scrutiny. Indeed, Magnusson (1999) argues that theoretically sound variable-oriented research does contribute real knowledge about operating factors within the person's psychological systems, while also emphasizing the need to base the selection of variables upon careful description and analysis of the system under consideration and cautioning

toward their inappropriate reification. The latter issue has been discussed at greater depth by Lamiell (1987), who has pointed out that psychological constructs that have been generated through variable-oriented research (e.g. factor analysis) refer to average differences existing *between* individuals in a population rather than properties existing *within* individuals. It follows that person-oriented research employing such variables must take into consideration the applicability of the variables not just to the system as such, but also to the individuals who are being studied.

A similar point can be made about the developmental trajectories of the systems under scrutiny. When postulating inter-individual developmental regularities on the basis of person-oriented analyses, it is important to consider the applicability of the regularities to single individuals, as emphasized particularly by Molenaar (2004). To this end, there is today a growing interest in person-oriented methods that calculate multivariate longitudinal trajectories for each single individual *before* generalizing across individuals, instead of calculating inter-individual similarities between system configurations at each time-point (Sterba & Bauer, 2010).

The content holism of intentional systems

Philosophical basis

Human beings are biological organisms, subject to the same chains of cause and effect, and often even the same biological and psychological systems, as other animals. But human beings are not just that. As noted by many person-oriented theorists (Allport, 1937; Lamiell, 1987; Magnusson, 1999; Stephenson, 1953; Stern, 1938), human beings also have characteristics that set them apart from other animals, which are necessary to take into account in understanding them fully *as persons*. Central among these is their capacity, as linguistic beings, to form abstract representations of the world and let them be symbolized by arbitrary, complexly combinable signs, which enables them to rise above their primeval urges and immediate sense impressions. Only human beings have the capacity to construct and act upon reasons and to pursue, defend, and even wage wars over meanings. Only human beings live in a complex symbolic world, including phenomena such as political parties, universities, human rights declarations, birthday parties, nationalities, and literary genres, which exist only by virtue of the status we collectively confer upon them by treating them as real (Hacker, 2007; Searle, 2010).

The very notion of personhood is, in fact, part of the folk psychological concepts and theories[2] we use in everyday life to understand ourselves and others – we talk about persons as free, rational, moral, and cultural beings, driven by beliefs, goals, emotions, values, and so on (Davidson, 2001/1974; Dennett, 1987; Hacker, 2007; Searle, 1983; Strawson, 1959). This folk psychological language has proved to be even less amenable to nomological treatment than the complex mechanisms comprising biological systems.

One of the reasons for the nomological irreducibility of folk psychology is that it treats the person as more intimately connected to the world than mechanistic descriptions do. It ascribes *intentionality* to the mental, construing mental states and processes as being about, or directed at, some aspect of the world – that is, as being *intentional states and processes*. For example, you may be angry *with your friend*, believe that *it is raining outside*, or desire *ice dream*. Intentional states and processes consist of a conceptual or propositional content representing some aspect of the world (i.e., your friend, it is raining outside, and ice cream), and emotional, epistemic, or conative-volitional attitudes held toward that content. The intentional content is, furthermore, in part constituted by what it is about, and conditioned by the person's history of causal interaction with the world; for example, a desire for ice cream can only be a desire *for ice cream* because ice cream is an aspect of the world that the person has come to know through interaction with it (Searle, 1983). In other words, the world makes different forms of intentional thought and action possible by affording the raw materials that can be represented and acted upon, as well as cultural discourses and narratives that structure our intentional engagement with it. Without the world, there is nothing for our emotions, goals, beliefs, intentions, and so on, to be directed at, and derive content from (except for the content they derive from each other). But the world is not static. Technological, political, environmental, and cultural conditions, and particularly the socially constructed aspects of reality, can change unpredictably and can be proactively molded by us. Therefore, much of our intentional thought and action is not amenable to the sort of historically and culturally invariant generalizations envisioned within the traditional nomological account of explanation. Rather, intentional generalizations are sensitive to the current structure of the world, within the contextual domain to which they apply (Fay, 1983).

The second main reason for the nomological irreducibility of folk psychology is that it describes the person as an intentional system that is holistic in terms of content[3] and

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imbued with rationality. The components of this system are intentional states, and are interrelated by virtue of logic rather than material causality. Given that we understand intentional states as in part constituted by their logical relations to each other, we cannot understand them as independent of the systems of meaning they are embedded within (Davidson, 2001/1970; Dennett, 1987; Searle, 1983). As Davidson (2001/1970) remarked in a seminal paper on this topic:

> There is no assigning beliefs to a person one by one on the basis of his verbal behaviour, his choices, or other local signs no matter how plain and evident, for we make sense of particular beliefs only as they cohere with other beliefs, with preferences, with intentions, hopes, fears, expectations and the rest. It is not merely, as with the measurement of length, that each case tests a theory and depends upon it, but that the content of a propositional attitude derives from its place within the pattern. (Davidson, 2001/1970, p. 116)

We could, for example, only make sense of a given political attitude by assuming that the person has a numerous beliefs about the existence, sentience, desires, and well-being of human beings and about the existence, functioning, malleability of economic and social systems, as well as moral preferences about fairness, meritocracy, and so on, and insofar as we see it as embedded within a broader ideological system, we will understand its content also as partly determined by its role within this system. The attitude in question is what it is in part by virtue of the systems of meaning it is embedded within. Each attribution of beliefs and preferences to the person we are trying to understand rests in turn upon the attribution of many other intentional states to him or her, and this leads to content holism.

The intentional states and events are, furthermore, related not just to each other, but also to actions, by virtue of logic rather than material causality. The beliefs, desires, goals, intentions, and shared collective meanings that are invoked to explain the action form a reason that *defines* the action; for example, an altruistic action is altruistic by virtue of expressing an intention to act altruistically. Actions must therefore, just like mental states, be situated within a broader web of beliefs, emotions, attitudes, and so on, for us to be able to make sense of them in intentional terms.

A key implication of this content holism is that the components of intentional systems cannot be fully divorced from the system they belong to and inserted into another one, in the same way that a biological organ can be transplanted, because they have no independent existence, and it is the intentional system as a whole rather than its components that has neurophysiological realization and behavioral

theories may be as semantically holistic as intentional ones, but this does not mean that they describe persons in terms of content holism.

manifestation. Therefore, nomological explanation, which is predicated on the possibility of isolating replicable events, is difficult to square with intentional discourse.

It is, however, natural to ask how we can ever come to understand another person at all, given this far reaching holism of the mental, and all the myriads of possible logical relations between different intentional contents. There seems to be but one way we can do this. We can only make any entity intelligible as an intentional system by understanding it through a pre-conceived theory of interpretation that imposes conditions of rationality upon the system. Just like mechanistic systems presumably have a finite number of configurations and developmental trajectories that are biologically and psychologically possible, there is a finite number of configurations of an intentional system that are within the constraints of rationality and thus intelligible to us. As described by Davidson (2004/1982):

> We start by assuming that others have, in the basic and largest matters, beliefs and values similar to ours. We are bound to suppose someone we want to understand inhabits our world of macroscopic, more or less enduring, physical objects with minds and motives; and that he shares with us the desire to find warmth, love, security, and success, and the desire to avoid pain and distress. As we get into matters of detail, or to matters in one way or another less central to our thinking, we can more and more easily allow for differences between ourselves and others. (Davidson, 2004/1982, p. 183)

Although philosophers debate over just how far we need to go in ascribing rationality, and similarity with ourselves, to the system we are trying to understand in intentional terms (Davidson, 2004/1982; Føllesdal, 1982; Grandy, 1973), it is clear that we at least need to assume that it shares basic desires and perceptions of reality with us and that it is a rational system with general consistency among its mental states and between mental states and actions (i.e., it generally does what it *should* do, given its mental states). These assumptions are constitutive of the intentional level of description; without them, we cannot even get the process of interpretation started at all, but once they are in place, they enable us to acquire intelligible data about the system that we can use to enrich and individualize our understanding of it. They allow us, furthermore, to make sense of specific irrationalities and inconsistencies. As Davidson (2004/1982, p. 184) put it: "We have no trouble understanding small perturbations against a background with which we are largely in sympathy, but large deviations from reality or consistency begin to undermine our ability to describe and explain what is going on in mental terms".

This folk psychological strategy of interpretation is not perfect. It is approximating, simplifying, idealizing, and probabilistic, and it necessarily involves the imposition of conditions of consistency and rationality upon the system we are interpreting (Davidson, 2001/1974; Dennett, 1987).

It may be that we group together intentional states or processes of different persons not because they have the *exact* same content (which would require the whole network of related contents to be the same), but because they are similar *to a sufficiently high degree* (Block, 1987) for our classification to make the persons intelligible and predictable as intentional systems.

There is, however, a crucial methodological division with regard to the strategy we use to individualize our understanding of a person as an intentional system. We can, as usually is the case in psychological research, operationalize a set of variables and measure the person's scores on these variables, thus fixing the concepts used to interpret the person's intentional states and processes prior to data collection. This is the strategy employed within Magnusson's (1999) interactionist approach when including intentional concepts in the description of the mechanistic systems under scrutiny[4]; his approach is, in this sense, person-oriented with regard to causal interactions and functions but variable-oriented with regard to the contents of intentional states and processes. The other strategy at our disposal is to develop our interpretive framework, through a process of hermeneutic interpretation, so that it better captures the qualities and organization of the person's mental contents, as is typically done in the type of research sometimes referred to as *Qualitative* rather than *Quantitative*[5]. In the so called *hermeneutical circle*, we use our initial, prejudiced understanding of the whole system to make sense of its parts, and we use our understanding of the parts, in turn, to gradually update and fine-tune our understanding of the whole (Gadamer, 1975). This hermeneutic form of interpretation is clearly more sensitive to individuality and potentially allows for more in-depth understanding of an intentional system than the measurement of pre-defined variables does – it is person-oriented with regard to intentional contents.

A hermeneutic strategy for interpretation does, however, not preclude the usage of mathematics and other methodological devices traditionally used by psychologists. Most notably, Stephenson (1953) developed Q-methodology to try to combine openness to the qualities of the person's mental states with a precise and rigorous methodology. Stephenson (1953) became perhaps the main proponent of a person-oriented *methodology* that invokes content holism,

although the contours of content holism were present in person-oriented thought already in Stern's (1938) notion of the person as an indivisible "unitas multiplex".

Stephenson's Q-methodological study of subjectivity

Like Magnusson, Stephenson (1953, 1967, 1991) was critical of research that uses a variable-oriented and hypothesis-testing methodology, modeled upon the paradigm of Newtonian physics, regardless of the research problem at hand. Although he emphasized the role of both theory and empirical testing of theory, he believed that psychology had not progressed far enough for hypothesis-testing to deserve the dominant role it had:

> Psychology, it seems to us, has by no means achieved a sophisticated theoretical status, with ideal constructs such as physics has fashioned for itself. The situations in psychology, therefore, call for an attitude of curiosity, as well as one of hypothetico-deductive logic. A somewhat detached, but inquiring, attitude is called for, in which one seeks to learn more about the intrinsic empirical possibilities rather than the purely logical, deductive, or carefully reasoned ones [..] Curiosity should govern all else, the hypothetico-deductive methodology being a servant and never the master of science. (Stephenson, 1953, pp. 151-152).

But unlike Magnusson, Stephenson's focus was not on the person as a complex causal system; rather, it was on subjectivity as it manifests itself in behavior – which he called *operant subjectivity* – from a folk psychological point of view:

> Ours is the kind of content that the biographers have freely managed to use all down the centuries – we seek to study men's motives, their sayings, musings, imaginings, doings, thoughts, reveries, dreams, cogitations, jealousies, and all else of the kind that a Dickens or a Shakespeare or a Hawthorne dwelt upon. This is the region of *subjectivity*, and perhaps of *personality* as such (Stephenson, 1953, p. 349).

Stephenson's goal was to develop an objective methodology for the study of subjectivity, which he called Q-methodology and contrasted with traditional variable-oriented R-methodology. He sought to dissolve the dichotomy between subjectivity, addressed within the provinces of the arts, literature, hermeneutics, and so on, and rigorous, objective science.

Although his discussions of subjectivity were entangled with a mental behaviorism that later fell into disrepute, and parallels to quantum physics with questionable relevance, Stephenson's Q-methodology bears the hallmarks of content holism and hermeneutic interpretation. Instead of measuring variables that are predefined and operationalized from an external frame of reference, Stephenson sought to

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[4] The fact that intentional concepts resist nomological treatment implies that the causal relations of their referents to other system components are necessarily probabilistic; it does not mean that they cannot properly be treated as components of mechanistic systems. See "The compatibility of causal interactionism and content holism" below.

[5] Although the Quantitative-Qualitative divide may refer to many different distinctions, the division between fixing and modifying the interpretive framework is the most methodologically substantial one.

generate constructs from the person's own internal frame of reference. Through Q-methodology, he hoped to provide a way of understanding each expression of subjectivity hermeneutically, in terms of the person's whole subjective point of view, coupled with an objective procedure that, to the extent possible, avoided projecting the researcher's frame of reference upon the person's communications. Stephenson claimed that

> It is possible to experiment upon matters of theoretical interest about attitudes (with all the power of experimental design, variance analysis, and dependency factor analysis to further one's investigations) without the slightest reference to *norms*, nomothetic *scales*, or any *measurements* for individual differences. (Stephenson, 1953, p. 220)

In his Q-methodological procedure, the person sorts ("Q-sorts") a set of materials ("Q-sample"), such as statements, pictures, traits, or essays, sampled from, for example, the person's own communications, cultural discourses, or previous questionnaires, preferably in an ecologically valid way. The person sorts these materials into a set of piles (today usually with a computer program, e.g., Schmolck, 2014) on the basis of his or her agreement to, approval or enjoyment of, or other type of judgment about them. The piles can, for example, be numbered from -3 (Strongly disagree) to +3 (Strongly agree), and the participants are typically asked to place a fixed number of materials into each category, which makes the distribution of data quasinormal (McKeown & Thomas, 1988). The data are subjected to an "inverted" factor analysis that groups persons with similar response patterns rather than items that co-vary; Stephenson preferred the somewhat unconventional centroid method of factor extraction because it leaves most room for theoretical understanding to determine the factor solution, thus making the analysis less mechanical (McKeown & Thomas, 1988). The resulting factors represent shared points of view of distinct groups of persons, and they can also be treated as prototypes that each individual loads positively or negatively upon.

Content holism enters this picture through the sorting procedure and the interpretation of the factors. First, because the materials are sorted, they are explicitly compared to each other, and thus understood in the context of the whole Q-sample rather than in isolation from each other. By encouraging participants to consider similarities and differences, as well as potential logical relations, between the presented materials, the sorting procedure is likely to make the data more informative about the structure of the participant's understanding of the materials than they would be if the materials were judged one by one.

Second, because participants place materials that they feel most strongly about in the extreme categories and materials they are neutral, ambivalent, or uncertain about at the center point of the distribution, Stephenson (1967) reasoned that the Q-sorts of different persons are placed on a common metric of subjective psychological significance, and that it is the highly psychologically significant materials that are most relevant to the interpretation of the factors. These highly significant materials illuminate key loci of meaning that are central to the structure of the intentional system.

Third, the subjective meanings of the materials are interpreted hermeneutically, in light of the whole Q-factor, without "extramural assumptions about what a statement might mean 'in general,' or 'on the average'" (Stephenson, 1953, p. 195). This interpretive process involves trying to understand how the different parts of a Q-factor fit together and how they form a unitary and logically coherent point of view that it would make sense for a rational being to have, given background assumptions about human nature, the cultural context, and the beliefs, traits, emotions, past experience, and so on, of the persons who completed the Q-sorts. Unlike Magnusson's interactionism, where validity and reliability is assessed at the level of variables entered into the analysis, it is only the generated points of view that can have validity and reliability, as unified wholes, in Q-methodology.

Another feature of Q-methodology that is characteristic of the content holism of intentional systems and that sets it apart from Magnusson's interactionism is that it deals only with meaning-laden, subjectively communicated data, without "concern with the brain, conditioning of the nervous system, or with cybernetic models of these physiological matters" (Stephenson, 1953, p. 4). Although it may be meaningful to consider disparate biological, mental, and behavioral properties, conceived of in mechanistic, interactionist terms, as representing parts of the same complex system, it would be nonsensical to combine them in this way in a system that is holistic in terms of content. Due to the content holism of intentional states, folk psychology simply cannot supply the required logical connections between mental and biological properties (Davidson, 2001/1970).

Facing up against criticism from giants such as Eysenck, Burt, Cattell, and Cronbach, Stephenson was, however, unable to fully convey his vision and its merits to the psychometric research community. To his critics, Q-methodology was just the usage of an ipsative response format and an inverted factor analysis on a transposed data matrix, and this was the narrative that became standard in textbook accounts of Q-methodology. Stephenson's idea that a Q-data matrix is, because of its holistic, internal frame of reference, fundamentally different from, and not transposable into, an R-data matrix, was lost on mainstream psychology (Brown, 1997), although a limited number of researchers continued to use and advocate Q-methodology (Block, 1961; Brown, 1980; Thomas, 1976).

The compatibility of causal interactionism and content holism

The differences between causal interactionism and con-

tent holism that have been discussed so far are summarized in Table 1. Given that the relations between the components of an intentional system are logical rather than causal, philosophers have sometimes thought that there is a deep incommensurability between intentional and mechanistic descripttions. On an influential view that is commonly attributed to Wittgenstein (1953)[6], psychology is mistaken in treating intentional states as referring to internal psychological properties with causal powers, and this mistake results from a confusion, inherent in everyday language, between the reasons we make up to justify our actions and the causes that brought the actions about. On this account, intentional predicates refer to something like social masks we wear, roles and reputations we negotiate, justifications we make up to defend our actions, and other acts that serve to make up the fabric of our social world, rather than internal causal properties (Harré, Clarke, & DeCarlo, 1985).

Table 1.
Summary of differences between causal interactionism and content holism

	Causal interactionism	Content holism
System	Mechanistic	Intentional
Relations	Causal	Logical
Explanation	Functions and mechanisms	Reasons and shared meanings
Example of methodology	Magnusson's developmental approach	Stephenson's Q-methodology

But following Davidson (2001/1963), many philosophers abandoned this alleged dichotomy between intentionality and causality. Davidson argued that the causes of one and the same action can be described both in nomological terms and in intentional terms and that a reason explains an action only if it cites intentional states that were actually part of the reasoning processes causing the action; that it conforms to the rules of a folk psychological language game is not enough. The reasoning processes need not consist in a deliberate calculation of costs and benefits or even be conscious to the agent. What matters is that the explanation cites beliefs, intentions, goals, emotions, and so on, that de facto caused the action.

This makes reason-based explanation a sub-species of causal explanation, rather than an altogether different kind of activity, although it operates at the intentional rather than mechanistic level of description. Expanding this account, Davidson (2001/1970) also argued that each intentional state is identical to a brain state although each *type* of intentional state does not correspond to a particular *type* of brain state. While acknowledging the nomological irreduc-

ibility of intentional concepts, Davidson argued that we, nevertheless, have good reasons to believe that intentional generalizations are underpinned by more precise laws that could, in principle, be stated in a different kind of vocabulary (they are "heteronomic"). In other words, intentional and mechanistic descriptions of persons may, on this view, refer to the very same psychological states, albeit illuminating different properties of these states.

In a similar but more instrumentalistic vein, Dennett (1987) has argued that the intentionality of an object exits by virtue of our ability to make its behavior predictable in intentional terms – that is, by our successfully viewing it from *the intentional stance*. We could also view the object from *the design stance*, as having functions tailored by evolution or human purposes, or from *the physical stance*, as amenable to strict physical laws. But for purposes of predicting human (and sometimes non-human) behavior, the intentional stance is an eminently useful strategy according to Dennett (1987): It enables us to "operate on multiperson projects, learn from each other, and enjoy local periods of peace", which would be "unattainable without extraordinarily efficient and reliable systems of expectation-generation" (p. 11), and it is a "rationalistic calculus of interpretation and prediction – an idealizing, abstract, instrumentalistic interpretation method that has evolved because it works and works because we have evolved" (p. 48).

Others have, however, been less sanguine about the utility of intentional descriptions, due to the nomological irreducibility and other messy properties of these descriptions. Most notably, Churchland (1986) has argued that folk psychology is a misleading account of the causes of human behavior that will, much like folk physics and folk biology, be rendered obsolete by future scientific advances. Indeed, questions about whether, and in what sense, intentional systems are real psychological systems existing independent of folk psychology, whether folk psychology is just a theory supplying us with convenient fictions that are useful for simplifying the world, or whether folk psychology is a deeply flawed, unscientific theory (Churchland, 1986; Davidson, 2004/1987; Dennett, 1987; Searle, 1983) continue to stir philosophical contention to this day. For our present purposes, it is, however, sufficient to note that the intentional level of description is indispensable for a psychology that aspires to deal with persons, because the very notion of personhood is in itself deeply embedded within folk psychology (Davidson, 2001/1974; Hacker, 2007). Without the intentional level of description, we simply forego the possibility of understanding anything fully as a person and of drawing on the explanatory and predictive resources of folk psychology. To abandon intentional descriptions would therefore be to also jettison the very idea of the person as a proper target of scientific inquiry.

The only viable option for a psychology that focuses on persons and aspires to accord both mechanisms and intentional states causal powers, without the metaphysical excesses of Cartesian dualism – that is a psychology of the

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[6] Whether this is a formulation Wittgenstein would approve of, or whether it is even consistent with Wittgenstein's general style of philosophizing, is, as pointed out by one reviewer, debatable.

sort that person-oriented theorists, such as Allport (1937), Magnusson (1999), and Stern (1938) have long defended – thus seems to be to adopt a non-reductive materialist account that acknowledges mutually irreducible forms of description of the same psychological phenomena (e.g. Davidson, 2004/1987; Dennett, 1987; Searle, 1983). Magnusson's (1992) influential claim that it is the characteristics of the phenomena under scrutiny that determines the appropriateness of the chosen methodology must therefore be complemented with a consideration of the level of description operative in the identification of these characteristics. Mechanistic and intentional descriptions unveil and illuminate different kinds of characteristics of persons and fit different kinds of person-oriented methodologies. Research questions construing the person as a mechanistic system implicate causal interactionism and fit with Magnusson's (1999) approach, whereas research questions construing the person as an intentional system implicate content holism, and fit with Stephenson's (1953) approach.

Discussion

Person-oriented research is predicated on a notion of the person as an organized system rather than a collection of isolated fragments and embraces a holistic focus on the person as a whole. But this general, and somewhat vague, description obscures important philosophical and methodological differences between different ways of construing and studying the person as a system. I have argued that we, specifically, need to disentangle causal interactionism, which treats the psychological functions and consequences of each system component as dependent upon its role in the system as a whole, from content holism, which treats the content of each system component as partly constituted by its relations to the system as a whole. Causal interactionism is a basic feature of our understanding of the hierarchically organized, functionally integrated, mechanistic systems that make up all living organisms. Content holism is a basic feature of our understanding of intentional systems, whose components are portrayed, from a folk psychological perspective, as interweaved by virtue of principles of logic and rationality rather than material causality. Causal interactionism can be exemplified in terms of Magnusson's (1999) developmental approach, which models the organization of mechanistic systems in terms of within-person patterns across variables and studies their development over time. Content holism can be exemplified in terms of Stephenson's (1953) Q-methodology, which seeks to generate data that preserves the structure of subjective meanings, without predetermined variables, and to understand these structures hermeneutically, as unitary viewpoints.

There are surely other kinds of systems and within-person patterns than the ones addressed here, including social systems (Searle, 2010) and cross-situational behavioral signatures (Mischel, 2004), and the patterns of within person-variation over time (Molenaar, 2004) would deserve

to be discussed at greater depth. Yet the distinction between mechanistic and intentional levels of description is fundamental to the study of persons. A greater appreciation of the importance of this distinction would be beneficial for person-oriented theory and research. Although the emphasis on fit between research problem and methodology in person-oriented theory is commendable, the previous neglect of the role of levels of description is problematic. The intentional and mechanistic levels of description allow us to formulate different kinds of research questions and to interpret the data in different ways. They may also motivate us to make different methodological decisions about how to optimally collect and analyze data, as exemplified by the differences between Magnusson's and Stephenson's methodologies.

But further work is needed to elucidate the varieties of person-oriented research problems enabled by the mechanistic and intentional levels of description, respectively, and the methods most suitable for addressing them. Previous reviews of the methodological tools available to address different kinds of person-oriented research questions (Bergman & Magnusson, 1997; Sterba & Bauer, 2010) focus chiefly on the interactionistic perspective. Surely several of these methodological tools can be used also to address person-oriented problems at the intentional level of description. Sometimes even the exact same results (e.g. from a cluster analysis of responses to a set of questionnaires) could be interpreted from either an intentional or a mechanistic point of view. But methods that are more specifically tailored to the intentional level of description, such as Stephenson's Q-methodology, are less thoroughly explored in the previous person-oriented literature.

Further work is also needed to clarify the relationship between person- and variable-oriented forms of research, in order to learn how to harness their potential complementarity and illuminate the relevance of person-oriented research to contemporary mainstream research in psychology. It is, I suggest, important not to exaggerate the gulf between person- and variable-oriented methodologies. Although person-oriented methods are particularly well-suited to the pursuit of in-depth understanding of the whole person as a mechanistic or intentional system, all studies of persons necessarily involve a degree of decontextualization and simplification of the systems under scrutiny. When studying mechanistic systems as within-person patterns across variables, we necessarily operate on idealizing assumptions about the applicability of the variables to the individuals we study and the irrelevance of system properties we have not measured. Even when trying to understand the unfathomable holistic complexity of intentional systems without predetermined variables, we are bound to ultimately reduce them to a limited set of core assumptions, constructs, values, and narrative scripts – a *worldview* (Nilsson, 2014) – in order to make them optimally intelligible. Because both holistic and interactionistic methodologies allow us to treat person factors as prototypes that each person has a degree of similarity or dissimilarity to (i.e. factor loading), and

they presuppose a degree of robustness in the meaning structures and system configurations that can occur within and between individuals (Magnusson, 1999; Stephenson, 1953), the progression of person-oriented research should allow us to design new variables that capture these robust prototypes, including their breadth and sensitivity to person-level patterns. It should also allow us to develop confirmatory methods that allow us to more rigorously test our theories of robust meaning structures and system configurations (Sterba & Bauer, 2010). Conversely, variables developed through theoretical or variable-oriented means can be evaluated through person- oriented methods, in terms of their applicability to persons (Grice, 2004; Nesselroade, Gerstorf, Hardy, & Ram, 2007; Thomas, 1976). The variable-oriented findings can, furthermore, potentially be used to enrich the prejudicial assumptions we need to initially feed into the hermeneutic circle when grappling with individuals as intentional systems. In other words, although Magnusson and Stephenson are right to criticize the variable-oriented monopolization of research in psychology, it is, I suggest, not merely the case that variable-oriented findings are, as Stephenson (1953, p. 100) put it, "*postulatory* to the more essential problems of psychology". Rather, the relationship between person- and variable-oriented forms of research is a potentially more interactive and mutually beneficial one (Nilsson, 2014).

Finally, the mechanistic and intentional levels of description are both necessary for understanding persons fully, and neither is inherently superior to the other. But it is the mechanistic framework that dominates psychology today, even within the field of person-oriented research. Attempts to engage with the philosophical literature on mind, intentionality, and personhood are conspicuously absent from contemporary academic psychology. Yet it is not enough to explicitly recognize that persons are proactive, rational agents, and moral, political, religious, and philosophical beings, motivated to pursue meanings and assuage existential fears and anxieties. We also need to understand, and take seriously, the characteristics of the intentional level of description that underlies these sorts of descriptions of persons (Nilsson, 2013, 2014), including the content holism of intentional systems explicated in this paper. We need to recognize that the monolithic, physics-inspired methodological ideal of mainstream psychology includes not just variable-centeredness, hypothesis-testing, and linearity, but also a mechanistic level of description. Person-oriented theorists, who have always emphasized the need for a theoretically sound foundation for psychology, that treats human beings fully as persons rather than mere things or animals (Allport, 1937; Lamiell, 1987; Magnusson, 1999; Stern, 1938), have a special responsibility for leading the way.

References

Allport, G. W. (1924). The study of undivided personality. *Journal of Abnormal and Social Psychology*, *19*, 132–141. doi: 10.1037/h0064744

Allport, G.W. (1937). *Personality: A psychological interpretation*. New York: Holt, Rinehart & Winston.

Allport, G. W. (1961). *Pattern and growth in personality*. New York: Holt, Rinehart & Winston.

Bechtel, W. & Wright, C. (2009). What is psychological explanation? In P. Calvo and J. Symons (ed.) *Routledge companion to philosophy of psychology* (pp. 113-130). London: Routledge.

Bergman, L. R. & Andersson, H. (2010). The person and the variable in developmental psychology. *Journal of Psychology*, *218*(3), 155-165. doi: 10.1027/0044-3409/a000025

Bergman, L. R. & Lundh, L. G. (2015). Introduction: The person-oriented approach: Roots and roads to the future. *Journal for Person-Oriented Research*, *1*(1-2), 1-6. doi: 10.17505/jpor.2015.01

Bergman, L. R. & Magnusson, D. R. (1997). A person- oriented approach in research on developmental psychopathology. *Development and Psychopathology*, *9*, 291-319. doi: 10.1017/S095457949700206X

Bergman, L. R. & Trost, K. (2006). The person-oriented versus the variable-oriented approach: Are they complementary, opposites, or exploring different worlds? *Merrill-Palmer Quarterly*, *52*(3), 601-632. doi: 10.1353/mpq.2006.0023

Block, J. (1961). *The Q-sort method in personality assessment and psychiatric research*. Springfield, IL: Charles C. Thomas. (reprinted 1978 by Consulting Psychologists Press, Palo Alto, CA).

Block, N. (1987). Advertisement for a semantics for psychology. *Midwest studies*, *10*(1), 615-678. doi: 10.1111/j.1475-4975.1987.tb00558.x

Brown, S. R. (1980). *Political subjectivity*. New Haven, CT: Yale University Press

Brown, S. R. (1997) *The history and principles of Q methodology in psychology and the social sciences*. Department of Political Science, Kent State University, Kent, OH. Retrieved 2015 03 17 from http://facstaff.uww.edu/cottlec/QArchive/Bps.htm

Churchland, P. S. (1986). *Neurophilosophy: Toward a unified science of the mind/brain*. Cambridge, MA: MIT Press.

Davidson, D. (2001/1963). Actions, reasons, and causes. In D. Davidson, 2001, *Essays on actions and events* (pp. 3-20). New York: Oxford University Press. Originally published 1963, *Journal of Philosophy*, *60*, 685-700.

Davidson, D. (2001/1970). Mental events. In D. Davidson, 2001, *Essays on actions and events* (pp. 207-228). New York: Oxford University Press. Originally published 1970, in L. Foster & J. W. Swanson (Eds.), *Experience and Theory* (pp. 79-101). London: Duckworth.

Davidson, D. (2001/1974). Psychology as philosophy. In D. Davidson, 2001, *Essays on actions and events* (pp. 229-238). New York: Oxford University Press. Originally published 1974, in S. C. Brown (Ed.), *Philosophy of psychology* (pp. 41-52). London: Macmillan.

Davidson, D. (2004/1982). Paradoxes of irrationality. In D. Davidson, 2004, *Problems of rationality* (pp. 169-188). New York: Oxford University Press. Originally published 1982, in R. Wollheim, & J. Hopkins (Eds.), *Philosophical essays on Freud*

(pp. 289–305). Cambridge University Press.

Davidson, D. (2004/1987). Problems in the explanation of action. In D. Davidson, 2004, *Problems of rationality* (pp. 101-116). New York: Oxford University Press. Originally published 1987, in P. Pettit, R. Sylvan, & J. Norman (Eds.), *Metaphysics and morality: Essays in honour of J. J. C. Smart* (pp. 35-49). Oxford: Blackwell.

Dennett, D. C. (1987). *The intentional stance*. Cambridge: The MIT Press.

Fay, B. (1983). General laws and explaining human behavior. In D. R. Sabia & J. Wallulis (Eds.), *Changing social science: Critical theory and other critical perspectives* (pp. 103-128). State University of New York Press.

Føllesdal, D. (1982). The status of rationality assumptions in interpretation and in the explanation of action. *Dialectica*, *36*(4), 301-316.

Gadamer, H. G. (1975). *Truth and method*. New York: Continuum Publishing Group.

Gervais, R. & de Jong, H. L. (2012). The status of functional explanation in psychology: Reduction and mechanistic explanation. *Theory & Psychology*, *23*(2), 145-163, doi: 10.1177/0959354312453093

Glennan, S. S. (1996). Mechanisms and the nature of causation. *Erkenntnis*, *44*, 49-71. doi: 10.1007/BF00172853

Godfrey-Smith, P. (2003). *Theory and reality: An introduction to the philosophy of science*. University of Chicago Press.

Gould, S. J. (1984). Challenges to Neo-Darwinism and their meaning for a revised view of human consciousness. In S. J. Gould (2007), *The richness of life: the essential Stephen Jay Gould* (pp. 222-237). London: Vintage Books.

Grandy, R. (1973). Reference, meaning, and belief. *The Journal of Philosophy*, *70*(14), 439-452. doi: 10.2307/2025108

Grice, J. W. (2004). Bridging the idiographic-nomothetic divide in ratings of self and others on the Big Five. *Journal of Personality*, *72*, 203-242.

Hacker, P. (2007). *Human nature: The categorical framework*. Oxford: Blackwell publishing.

Harré, R., Clarke, D., & DeCarlo, N. (1985). *Motives and mechanisms: An introduction to the psychology of action*. New York: Methuen.

Hayek, F. A. (1967). The theory of complex phenomena: A precocious play on the epistemology of complexity. In Hayek. F. A., *Studies in Philosophy, Politics, and Economics* (pp. 22-42). University of Chicago Press.

Hempel, C. G. & Oppenheim, P. (1948). Studies in the logic of explanation. *Philosophy of Science*, *15*(2), 135-175.

Hume, D. (1978/1738). *A treatise of human nature*. Oxford University Press.

Lamiell, J. T. (1987). *The Psychology of Personality: An Epistemological Inquiry*. New York, NY: Columbia University Press.

Magnusson, D. (1992). Back to the phenomena: Theory, methods and statistics in psychological research. *European Journal of Personality*, *6*, 1-14. doi: 10.1002/per.2410060102

Magnusson, D. (1995). Individual development: A holistic integrated model. In P. Moen, G. H. Elder, & K. Lusher (Eds.), *Linking lives and contexts: Perspectives on the ecology of human development* (pp. 19-60). Washington, DC: APA Books.

Magnusson, D. (1999). Holistic interactionism: A perspective for research on personality development. In L. Pervin & O. John (Eds.), *Handbook of personality* (pp. 219-247). New York: Guilford.

Magnusson, D. (2001). The holistic-interactionistic paradigm: Some directions for empirical developmental research. *European Psychologist*, *6*, 153– 162. doi: 10.1027//1016-9040.6.3.153

Magnusson, D., & Törestad, B. (1993). A holistic view of personality: A model revisited. *Annual Review of Psychology*, *44*, 427–452. doi: 10.1146/annurev.ps.44.020193.002235

Mayer, J. D. (2007). Asserting the definition of personality. *P: The online newsletter for personality science*, *1*, 1-4. Retrieved 2015 09 04 from http://www.personality-arp.org/html/newsletter01/page5d.html.

McKeown, B.F., & Thomas, D.B. (1988). *Q Methodology*. Newbury Park, CA: Sage.

Mischel, W. (2004). Toward an integrative science of the person. *Annual Review of Psychology*, *55*, 1-22. doi: 10.1146/annurev.psych.55.042902.130709

Molenaar, P. C. M. (2004). A manifesto on psychology as idiographic science: Bringing the person back into scientific psychology, this time forever. *Measurement*, *2*(4), 201-218.

Nesselroade, J. R., Gerstorf, D., Hardy, S. A., & Ram, N. (2007). Idiographic filters for psychological constructs. *Measurement*, *5*(4), 217-235. doi: 10.1080/15366360701741807

Nilsson, A. (2013). *The psychology of worldviews: Toward a non-reductive science of personality*. Doctoral dissertation, Lund University, Sweden. Available online at: http://lup.lub.lu.se/record/3738772/file/3738786.pdf (Accessed August 10, 2015).

Nilsson, A. (2014). Personality psychology as the integrative science of traits and worldviews. *New Ideas Psychol. 32*, 18–32. doi: 10.1016/j.newideapsych.2013.04.008

Pervin, L. A. (2001). A dynamic systems approach to personality. *European Psychologist*, *6*(3), 172–176.

Quine, W. V. O. (1953). *From a logical point of view*. Harvard University Press.

Salmon, W. C. (1990). *Four decades of scientific explanation*. Minneapolis: University of Minnesota Press.

Schmolck, P. (2014). *The QMethod page*. Retrieved 2015 09 04 from http://schmolck.userweb.mwn.de/qmethod/

Searle, J. R. (1983). *Intentionality: An Essay in the Philosophy of Mind*. Cambridge: Cambridge University Press.

Searle, J. R. (2010). *Making the social world: The structure of human civilization*. Oxford University Press.

Shapiro, L. (2010). Evolutionary psychology. In E. Craig (Ed.), *Routledge Encyclopedia of Philosophy Online*. Retrieved 2015 09 04 from http://www.rep.routledge.com/

Stephenson, W. (1953). *The study of behavior: Q-technique and its methodology*. University of Chicago Press.

Stephenson, W. (1967). *The play theory of mass communication.* Chicago: Univesity of Chicago Press.

Stephenson, W. (1991). Introduction to Q-Methodology. *Operant Subjectivity*, *17*(1/2), 1-13.

Sterba, S. K. & Bauer, D. J. (2010). Matching method with theory in person-oriented developmental psychopathology research. *Development and Psychopathology*, *22*, 239-254. doi: 10.1017/S0954579410000015

Stern, W. (1938). *General Psychology, from the Personalistic Standpoint.* (H. D. Spoerl, Transl.). New York, NY: The Macmillan Company. doi: 10.1037/11642-000

Strawson, P. (1959). *Individuals*. London: Methuen.

Thomas, D. B. (1976). Exploring the personality-ideology interface: Q-sort consideration of Tomkins' polarity theory. *Experimental Study of Politics*, *5*, 47-87.

Wittgenstein, L. (1953). *Philosophical investigations* (G. E. M. Anscombe, Transl.). Oxford: Blackwell.