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RESPONSE TO COMMENTARIES

Default or Not Default on Imagery Perspectives Development

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We wish to express our sincere gratitude to all our colleagues for their expert commentaries on our paper. It is clear that they have applied their considerable knowledge and critical capacities to the argument we made about the development of internal and external imagery perspectives, providing many thought-provoking and stimulating ideas on various aspects of our presentation. Although most researchers in any field share substantial common ground in the established literature, there is no doubt that all of their experiences in research color their own views. This provides richness when colleagues compare their perspectives on the same topic. Add to this the diversity of research backgrounds across psychology, neurophysiology, and sport, as represented here, and we have an admirable repertoire of insights to stimulate our thinking and that of our peers. Indeed, it is because of this that we decided to address the major themes that emerged in the commentaries: namely, the definition of internal and external imagery perspectives, the measurement of imagery perspectives, the usefulness of a default hypothesis of imagery perspectives development, the contribution of neurophysiological research to understanding the development of imagery perspectives, and research directions to test and expand on a default hypothesis of imagery perspectives development. We address each in the order just listed, and while we do mention some specific comments, this remains subsidiary to our aim of responding to the main thrusts of the commentaries.

Before we begin, however, we would like first to comment on a question that emerged in several commentaries, that is, whether there is a need for a theory and research on imagery perspectives development at this time. It was argued by some commentators that imagery perspective is not one of the key components of imagery and, therefore, it might not merit the kind of attention we are recommending. In responding, we feel that it is important to reiterate the point we made in the original paper that whenever people imagine, they adopt a perspective. Research suggests that although perspective use does affect the outcome of imagery use, people rarely select their imagery perspective on the basis of any rational process and thus often adopt the less effective perspective. We argue that those who use imagery to enhance performance, such as sport psychology practitioners, could increase the effective use of imagery by helping people to more frequently match perspective use with the purpose of their imagery.
Related to this point, some commentators questioned the value of studying the development of imagery perspectives. We argue that examining the development of psychological processes often helps psychologists understand how these processes work and this, in turn, leads to the development of techniques to maximize their use. If our proposition that internal imagery is the default perspective and that an external imagery perspective develops to the extent that children (and adults) have experiences from the other's perspective is correct, then it has many implications for the learning and practice of imagery. Many children (and some adults) whose preference for an internal imagery perspective may not be optimal for attaining the goal may be trained to use external imagery in appropriate circumstances, leading to more successful use of imagery overall. Contrary to the suggestion made in at least one commentary, we want to stress that we are not proposing that external imagery should replace internal imagery in all circumstances. Rather, we argue for the judicious use of both types of imagery perspective. One way that helps us understand when each perspective is more appropriate and how to train people in its use is through research on the development of imagery perspectives. We strongly believe that continuation of this discussion and of research stimulated by this debate will be highly illuminating, as were the comments on this topic, that we will now discuss.

The Definition of Internal and External Imagery Perspectives

As a precursor to developing our argument regarding the development of imagery perspectives, we considered that it was important to acknowledge the role of the definition of internal and external imagery perspectives. Our analysis of the commentaries showed that the need to define these terms loomed large in our colleagues' thoughts, suggesting that further clarification and agreement is important to progress research on the study of imagery perspectives.

One issue that was raised concerned the possibility that the range of terminology used in cognitive psychology, which is similar in meaning to internal/external imagery perspectives, causes confusion in conceptualization of this phenomenon. Regarding these terms, Collet and Guillot (2012) mentioned actor/spectator, Holmes (2012) actor/observer as well as egocentric/allocentric, and Sutton (2012) field/observer. The message seems to be that there is the need for a thorough analysis of the meaning of all these terms, leading to greater clarity not only about what internal and external imagery perspectives are but also about what they are not. While this was not the aim of our paper, we agree and look forward to researchers taking up this challenge.

Another source of confusion, as pointed out by Olsson (2012) as well as Collet and Guillot (2012), appears to be the literature that discusses the dis-
Distinctive between kinesthetic and visual imagery in association with internal and external imagery perspectives. Callow and Roberts (2012) and Tobin and Hall (2012) stated their view that imagery perspectives should be considered to be visual only. We acknowledge that the perspective adopted by the person is often most readily determined by examining the visual framework, but at the same time, we maintain that all sense modalities can be experienced during imagery from both perspectives.

Regarding the external imagery perspective, Holmes (2012) and Sutton (2012) appear to agree with our position that there are, theoretically at least, an infinite number of external perspectives, and recent research on different angles mentioned by Callow and Roberts (2012) has a similar theme. We also concur with the position of Holmes and Sutton that the external perspective is about the self, a view that is consistent with that of Roberts et al. (2008) in their revision of the VMIQ. The comment made by Smith, Wakefield, and Wright (2012) about the importance of agency is helpful here, and their discussion of the issue is one of the clearest we have read.

Finally, we agree with the call by Holmes (2012) as well as Giacobbi (2012) not only for a clearer but also for a more precise use of terms.

The Measurement of Imagery Perspectives

If we are to provide a basis for understanding imagery perspectives and their development, we need appropriate measures. Although measurement of imagery perspectives remains problematic, our call for the development of a better psychometric instrument was reinforced by McKean and MacDonald (2012) as well as Tanaka (2012). As pointed out by Callow and Roberts (2012), such measures depend on a clear, operational definition of imagery perspectives, and although we acknowledge that reaching consensus on such a definition will be difficult, as discussed earlier, we do need to achieve some clarity on what it is that we are measuring.

The VMIQ-2 (Roberts et al., 2008), as we highlighted, has overcome many limitations of previous measures used to measure imagery perspective ability and we encourage researchers to use it for that purpose. We acknowledge the position of Callow and Roberts (2012) that the VMIQ-2 focuses on generic motor actions to allow for wider use and that a sport-specific imagery perspective ability measure may have limited ecological validity. We also recognize that the VMIQ-2 is not designed to establish imagery perspective use. The main purpose of our comments, however, was to emphasize that the VMIQ-2 measures imagery perspective as an ability, and that to investigate the development of imagery perspectives and the default hypothesis, we need measures of
imagery perspective use (rather than ability) in sport. If we are unable to measure use with a valid and reliable measure, it will be difficult to verify use patterns in development, as would be needed to support predictions from the default hypothesis. Callow and Roberts have provided a potential measure of imagery perspective preference with the adapted version of the VMIQ-2 (Callow, Roberts, & Amendola, 2012). Nevertheless, based on our studies in which measures of preference for internal and external imagery perspectives were relatively weak predictors of actual imagery perspective use (Spittle & Morris, 2007, 2011), we hold that there is still a need to delineate and measure imagery perspective use. As well, we recommend that future research systematically investigate the angle adopted during external imagery and how each affects the relationship between external imagery and performance outcomes.

The Usefulness of Default Theory

The main focus in our target article was the proposal of a default hypothesis of imagery perspectives development. Thus, we were particularly interested to examine how the commentators addressed it.

We welcome the thoughts and research reported by McKelvie and MacDonald (2012). Their critique of our position was informative, yet it did rest to some extent on propositions that we did not intentionally suggest. We do not propose differences in imagery perspective development between athletes and non-athletes. The reference we made to Piaget’s work, and its further development by researchers such as Epley, Morewedge, and Keysar (2004), is consistent with our position that the internal perspective is the default in all individuals and the extent to which they develop external imagery depends on their experience of that perspective in life in general. We understand McKelvie and MacDonald’s second concern with the default hypothesis to be that it depends upon, and we claim for it, different positive effects of internal and external imagery. Perhaps this is an issue of semantics, as we do not claim different effects, but rather differences in the effectiveness of internal and external imagery perspectives in different tasks or components of complex tasks. We acknowledge that research has produced varying outcomes, but there is so much variability in methods and contexts/tasks that no definitive conclusions can be drawn. We claim only that in our research we found predictable results for one task type comparison, namely, that between open and closed skills. We agree with McKelvie and MacDonald that further, carefully designed research is necessary. In particular, we emphasize that one important methodological issue is how to insure that participants are actually using the intended perspective and not simply relying on experimental instructions or pretest preferences as the basis for their perspective use.
Rigorous examination of our primary proposition that the development of imagery perspectives is a case of default theory is reflected in a number of commentaries. In particular, Moran and MacIntyre (2012) present an insightful commentary. Reflecting upon their comments about the adequacy of default theory, we concur that it does not meet all the essential requirements of a strong theory. Further, as they point out, it is quite probably not necessary to our proposition that young children imagine from an internal perspective and develop external imagery through their experience of the perspective of the other. Even if default theory is put aside, a default still appears to operate, as indicated by Epley’s (2004) use of the term egocentric default in his examination of perspective development in cognitive processing, which challenges Piaget’s proposition that the egocentric is replaced by the allocentric perspective in adults. Thinking about the development of imagery perspectives is still in its very early stages, and by opening up the topic for debate, we hope and expect that conceptualization will develop further. At this stage, we view the modifications of Piaget’s work by researchers such as Epley et al. (2004) and Donaldson (1978) as compatible with our proposition that external imagery develops with experience of the perspective of the other. Much seems to depend on who is asked and what he or she is asked about. In many situations, a proportion of adults favor an internal perspective, whereas in particular contexts, some younger people use an external perspective.

We acknowledge the claims by Smith, Wakefield, and Wright (2012) that the default hypothesis is simplistic and that evidence also exists of athletes who use an external perspective and require training in use of the internal perspective. As well, we note that Callow and Roberts (2012) and Moran and MacIntyre (2012) also state that there is evidence contradicting the default hypothesis prediction that an internal perspective is the default. In responding briefly, we would emphasize two points. First, we do not believe that any of these observations are incompatible with the central claim in our target article that internal imagery is the default perspective, because in very young children, it is the dominant mode of experience, supplemented by external perspective imagery to the extent that children experience the perspective of the other. Second, we welcomed the opportunity to present this proposition precisely for the purpose of stimulating a debate that we anticipated would help evolve thinking about imagery perspectives development. We feel that the excellent commentaries presented here have achieved that purpose in large measure. They promise much for generating continued discussion on the development of exciting new research and greater insights that will, in time, illuminate the processes involved in imagery perspective use, leading to applications that will improve the effectiveness of imagery use in sport.
The Contribution of Neurophysiological Research

COLLET AND GUILLOT (2012), OLSSON (2012), and TAKTEK (2012) each recommended that it would be important to examine recent neurophysiological work when considering the literature on internal and external imagery perspective as well as when testing the default hypothesis of imagery perspectives development. We proposed the default hypothesis based largely on initial behavioral research, which is vital for exploring the use of internal and external imagery perspectives, and especially in identifying patterns of use in the development of imagery perspectives. At the same time, however, we recognize and acknowledge the point made by COLLET AND GUILLOT (2012) that neurophysiological evidence could help to both validate and measure internal and external imagery perspectives. These commentators highlight the disparate research on imagery perspectives being conducted in the psychological, neurophysiological, and sports science fields and the urgent need to bring this work together. We agree that doing so could contribute much to our collective understanding of imagery perspectives in general and that, in particular, it could extend our exploration of the default hypothesis by helping us understand more about how imagery perspectives develop.

TAKTEK (2012) described some exciting neurophysiological studies whose methodology could overcome some of the perceived methodological concerns regarding reliance on behavioral evidence alone to scrutinize imagery perspectives development. As suggested, researchers could use both central and peripheral measures of nervous system activation during imagery of various motor tasks, such as skills that would be expected to utilize more of either an external or an internal imagery perspective.

OLSSON (2012) underlined that to progress a hypothesis of imagery perspectives development, it is important to understand the mechanisms through which imagery works, a focus that, we agree, is better served by neurophysiological than behavioral research. Olsson carefully outlines the neurophysiological evidence that would be required to support a default hypothesis. He argues that if internal imagery is the default, then the motor parts of the brain should be active during imagery of tasks early in development. Because experience of the physical skill is important to access motor representations, experience is important for the development of motor imagery. Olsson’s position appears to equate motor imagery with internal imagery and visual imagery with external imagery. Our position, however, is more in line with the position of CALLOW AND ROBERTS (2012), SMITH, WAKEFIELD, AND WRIGHT (2012), and TOBIN AND HALL (2012), who propose that imagery perspectives refer to the visual perspective adopted rather than the sensory modality experienced.
We encourage researchers to use this debate as a stimulus for more research collaboration among those of us investigating imagery perspectives through psychological, neurophysiological, and sports science lenses. It is also a call for researchers to explore the development and use of imagery perspectives from both behavioral and neurophysiological perspectives.

Research Directions

The commentaries on our proposal that the development of internal and external imagery perspectives reflects a default hypothesis provide rich fields for further research. We have already acknowledged some of the key questions raised on topics related to the definition and measurement of internal and external imagery perspectives. We have an abiding commitment to research linking the brain and behavior, and so we are excited by the prospect of research collaboration between psychologists, whether cognitive or sport-based, and neurophysiologists on questions related to internal and external imagery perspectives in general and on testing of the default hypothesis in particular.

We welcome further discussion with experts such as Collett and Guillo, Olson, and Holmes on the many important conceptual and practical issues they have raised regarding imagery perspectives and sports. In addition, we encourage the development of ideas about new directions for research expressed in many of the commentaries. This includes the consideration of imagery perspectives development in the context of exercise and movement generally as well as of sport in particular, as suggested by Giacobbi (2012), and examination of the use of imagery perspectives in relation to cognitive and motivational functions of imagery, as suggested by McKelvie and MacDonald (2012) and Stutton (2012). We also are interested in the expansion of research on imagery perspectives to other psychological constructs such as self-efficacy, as recommended by Giacobbi (2012), who also pointed out the limited age range of the samples in our studies of imagery perspectives that provided some of the insights that led us to the default hypothesis. We acknowledge that the participants in those studies were mainly young adult sports performers. Indeed, it is because of their age that we proposed a range of new research directions involving children and adolescents.

In this light, we reiterate our view that potentially the most useful research on the default hypothesis would be conducted with children, although the ethical and methodological challenges with this age group are substantial. We found it disappointing that our proposed research directions, which we considered the culmination of our argument for a default hypothesis of the development of imagery perspectives, generated little debate and hope that more will be forthcoming subsequent to the interactions in these pages.
Conclusions

The discussion stimulated by our proposal of a default hypothesis of imagery perspectives development is gratifying. The commentators raised many exciting and challenging issues regarding the conceptualization, operationalization, and study of imagery perspectives in general and the default hypothesis in particular. In view of the richness of these responses and the importance of the topic, we encourage colleagues to contribute further pieces as ideas or evidence come to mind not only at professional conferences but also in the JMI, which invites ongoing dialogue on open peer commentaries in its pages by current as well as new contributors. We look forward with excitement to expanding on the ideas presented here and to the bright future ahead for collaborative research on imagery perspectives.

References

