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Pathways of excellence in science and dance: Lessons learned from a Portuguese case study

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Many researchers are studying the early identification of exceptional individuals, expertise acquisition, personality, and the role of external catalysts, aspiring to explain their influence on the process of talent and expertise development. Researchers seek a deeper understanding of these exceptional individuals, using multiple methodologies and techniques, studying multiple contexts and domains, and focusing on multiple dimensions and constructs associated with excellence. Moreover, much psychological research on excellence takes a predominantly outsider perspective favoring quantitative inquiry, but little is really known about the experiences and personal meanings of exceptional individuals. In this study, we explored the insider perspective of being excellent. Using a case study approach, two dancers and two scientists were interviewed. A theoretically-oriented content analysis grid was constructed to assist data analysis. Overall, participants stressed personal characteristics such as extreme curiosity, persistence, and passion for their work as central features in nurturing and sustaining their motivation for practice, and also as key features of being an excellent performer. Additionally, intensive and hard work, discipline, and strong commitment were emphasized and other personal and contextual dimensions highlighted. Singularities and some reflections that emerged from this study are discussed.

Keywords: excellence; dance; science; performance; qualitative

The interest and curiosity about the lives of exceptional scientists, artists, or athletes has always encouraged researchers to search for the reasons and determinants of being creative and attaining high levels of performance. In science and performing arts, pioneering work by Roe (1946), Bloom (1985),

Gardner (1993), and Feist (2006) has inspired many researchers. For instance, Lubinski *et al.* (2001) tracked intellectually precocious youth over 25 years, reaching conclusions about stimulating early educational experiences, mentoring relationships, early development of interests, and strong commitment to career and work as significant attributes in developing exceptional expertise in science. Recently, Feist (2006) conducted and reviewed several studies on personality and development of scientists, arguing for the need of a new "psychology of science" for a complete understanding of scientific thought and behavior. Conversely, research in dance seems to be still developing, focusing essentially on classical and non-professional dancers, and more "negative" topics, such as eating behavior disorders, injury, stress, or physical and biomechanical issues (see Krasnow and Kabanni 1999). Still, some efforts have been developed towards a more complete dance science, with studies focusing on professional and elite performing artists and psychological issues, such as personality profiles, expertise, or motivation (e.g. Hays 2002, Kogan 2002, Ureña 2004).

Moreover, several theoretical models have been developed to explain the process of performing excellence in different domains (see Araújo *et al.* 2007). The theoretical models of Renzulli (2002) or Gagné (2004), explaining talent development, Ericsson's deliberate practice and expert performance approach (Ericsson and Charness 1994), as well as the Berlin school paradigm on the study of wisdom (Baltes and Staudinger 2000) represent some of the strongest approaches that influence current empirical research. Overall, findings suggest that singularity of exceptional individuals seems to emerge from a dynamic combination of contextual and personal factors.

Despite the vast amount of research on excellent performance, several issues remain ambiguous. Definitions of excellence are still vague and multiple criteria are used to identify excellent performance (Weiss *et al.* 2002, Trost 2000, Ureña 2004, Zannotto 2006). Additionally, little is known about the trajectories of excellent individuals from their own thoughts and meanings. Quantitative inquiry has been favored in the study of performance excellence, even if the singularity of successful trajectories and the complexity associated with performing excellence in adulthood is assumed. Nevertheless, qualitative methods are being gradually accepted as a valuable way to investigate singular and complex topics in-depth. Hence, a qualitative case study was conducted aiming to analyze the singularities and commonalities behind talent and success trajectories. In this paper, we present general findings and discuss some lessons learned from this research.

METHOD

Participants

Two female dancers (contemporary dance) and two scientists (life sciences, female and physics, male) were consensually identified by a panel of experts in each specific domain. Participants were all nominated for revealing excellence in performance and being actively engaged in their respective field. The ages of participants were 36, 41, 38, and 43, respectively.

Materials

The interview protocol was created after reviewing relevant literature and interview guides successfully used in previous studies with exceptional individuals in different domains (e.g. Connaughton *et al.* 2007, Kiewra and Creswell 2000). A semi-structured protocol covering the following main areas in a fluid and flexible sequence was used: (1) career path, (2) past achievements and actual performance, (3) expertise acquisition, (4) personal characteristics, (5) role models and significant others, and (6) relationships within each professional community. In addition, participants' academic and professional pathway and productivity were analyzed through their actualized curricula vitae.

Procedure

A nomination strategy was conducted to select participants. Although criticized, this strategy seems to be effective, particularly in domains where objective and rigorous criteria are difficult to establish and "gold standards" do not exist. In addition to peers' recognition, some quantitative criteria were considered (Weiss *et al.* 2002, Urenã, 2004, Zanotto 2006). Criteria to select scientists included: number of publications on refereed journals, number of citations, highly cited papers, awards, members of editorial boards, and grants. Awards, participation on international/European dance companies/projects, and professional certification were the criteria used to select dancers. Identified participants were contacted by email or telephone, study aims were presented, and data anonymity and confidentiality was guaranteed. Subsequent to participants' agreement, interviews were scheduled according to their time and location. Interviews were recorded integrally and transcribed verbatim and sent to participants for verification. A theoretically-oriented content analysis grid was designed to assist data content analysis. Since the interview protocol had a semi-structured and flexible format, themes in the analysis grid had a different organization reflecting that unan-

ticipated issues could arise during interviews. Transcripts were sorted into three main dimensions: (1) contextual factors, (2) personal factors, and (3) answers to a specific question: "what makes you an excellent professional." Texts were coded and analyzed using Maxqda qualitative analysis software and following the proposals of Schilling (2006) and Mayring (2000) on qualitative content analysis. Some validity procedures were used such as triangulation, member checking, and peer-debriefing (Onwuegbuzie and Leech 2007).

RESULTS

An overview of participants' productivity through their curricula vitae shows some evidence for their superior performance. The scientists had several publications in refereed journals, some of which are highly cited papers. We found them working within the most influential international research networks and heading research teams with national and international grant funding. The dancers were also distinguished by their creative and outstanding performance. They work with the most creative and renowned Portuguese choreographers and are frequently selected to perform on choreographic projects in Europe.

Interviews' content analysis highlighted several features confirming some general research findings (e.g. Feist 1996, Lubinski *et al.* 2001, Kogan 2002). Describing some aspects of macro context (social, historical, economical, cultural), all the participants mentioned that, at the time they started to become involved in domain-specific activities, Portuguese society was not sensitive to their domain (dance/research), and opportunities and choices were limited. Nevertheless, participants reveal that, currently, it is possible to find a stimulating and optimal professional environment. Furthermore, participants clearly identified significant people in their lives who provided important socio-emotional support but also an inspiring role in their career choices and opportunities. Transcript analysis also indicates a strong presence of individuality and singularity on participants' trajectories. Overall, participants stressed personal characteristics such as curiosity, perseverance, openness to new experiences, adaptability, and passion as central in nurturing and sustaining their motivation. Additionally, intensive and hard work, discipline and sustained commitment were considered important factors in performing excellence. Finally, all the participants affirmed their strong concern with society and a sense of social responsibility and also the importance of family and social networks as core life values.

DISCUSSION

In this study, the role of positive emotional states and strong psychological features are clearly associated with performing excellence, in addition to contextual factors. However, we observed a slight difference between artists and scientists, mainly on working strategies and career trajectories. Whereas careers in science are more organized and sequential, trajectories in dance are irregular and unstable. Scientists seem to plan more, following rigid schedules, while dancers have more flexible agendas and engage in multiple activities other than physical training, which seems to contribute to their technical and performance skills (Kogan 2002). Furthermore, this study provided a rich description of individuals' trajectories, showing several important conditions needed to excel in a small and peripheral country such as Portugal. Participants' critical picture of the Portuguese educational and professional system questions its role in the identification and encouragement of potential talents, suggesting the importance of mentorship and awareness of creative, sometimes unconventional, accomplishments. Not withstanding some well known limitations of qualitative case studies, we believe that more qualitative research is needed in order to promote a deeper understanding of performing excellence. A vast amount of research with scientists exists, but contemporary dancers are as yet under studied. Hence, the present case study suggests that scientists and dancers' personal wellbeing, as well as their career development patterns, are interesting topics for further research efforts.

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