Macrosystems Theory

Based on Bronfenbrenner (1977), Cook et al. (2002, 2005), Rice and Alfred (2014)

Summary prepared by Eric Riggs for the 2019 Earth Educators' Rendezvous

Efforts to broaden participation in the geosciences have traditionally been focused on individual programs, curricular innovations, or recruitment and retention strategies that are institution specific. While these are valuable and are rooted in theories of diversity that are seated in the individual learner and in curriculum structure, there are several programs that have shown notable success in serving underrepresented populations that take a broader focus. Within these institutions, there typically exist arrays of interacting programs and strategies that connect networks of individual institutions at a variety of educational levels and institution types and that enjoy internal, institutional political and financial support.

Working within the framework of Rice and Alfred (2014) and older foundational theories reaching back to Bronfenbrenner (1977), *micro*systems are defined as those factors related to student-centric factors, specifically self-image, identity, self- efficacy, and related affective domain constructs. Factors also grouped in microsystems are personal qualities of determination, persistence and also culture and identity. Microsystems are shown as the inner circle related to the Individual in Fig. 1.

*Macro*systems focus on structural and institutional cultural systems in place around students, rather than within them. These include family and peer support networks, professional mentorship, precollege programs, university resources, broader minority networks, and even employers and career planning. Macrosystems are shown as the outer circle related to the System in Fig. 1.

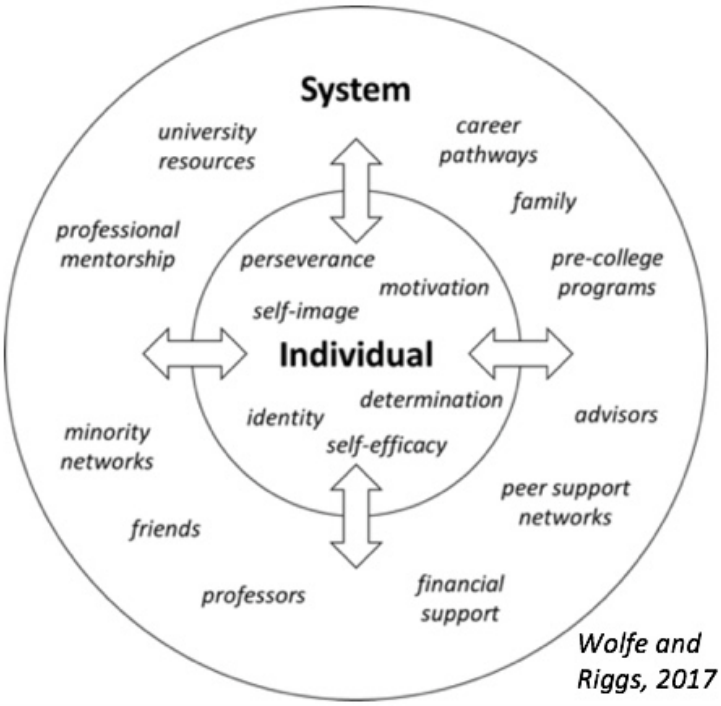

Figure 1: Macrosystems Model. This model is a graphical representation situating the individual student (or faculty member) within the many systems which surround them in an academic setting. The arrows show the bi-directional continuous interactions that shape the individual and the system and influence the direction and persistence of both. The italicized features illustrate a few of the specific examples of elements of the individual and system. These will all be engaged in interactions between an individual and the system around them, and should be taken into account when working to understand and optimize supportive programs for advancing students from diverse backgrounds. From Wolfe and Riggs, 2017.

Many geoscience programs and curricula over the past decade have made deliberate attempts to maximize the whole array of support systems around individual students in support of broadening participation. Leveraging and enhancing connections to macrosystems can enhance recruitment, retention, degree completion, and graduation of underrepresented students. Notable success strategies include explicit attention to bridge programs that capitalize on connections and coordination of external factors and entities. Pedagogical and curricular structures and strategies like inquiry-based and active learning in general and field- and place-based learning in particular make deliberate connections between micro- and macrosystems for all participants. Undergraduate research experiences also can provide successful connections for students, as do explicit efforts through other mentoring and network-building activities that have been shown to improve institutional climate and culture via student participation.

References

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