Promoting STEM Risk-taking by Balancing Gender

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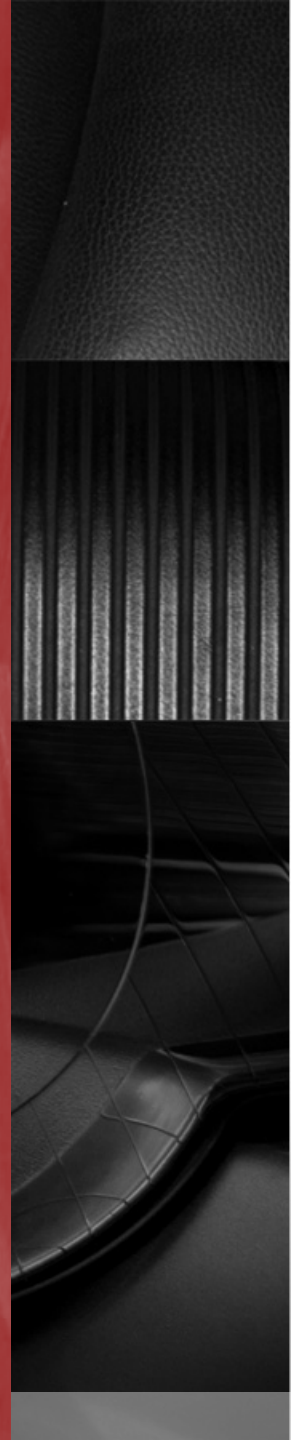
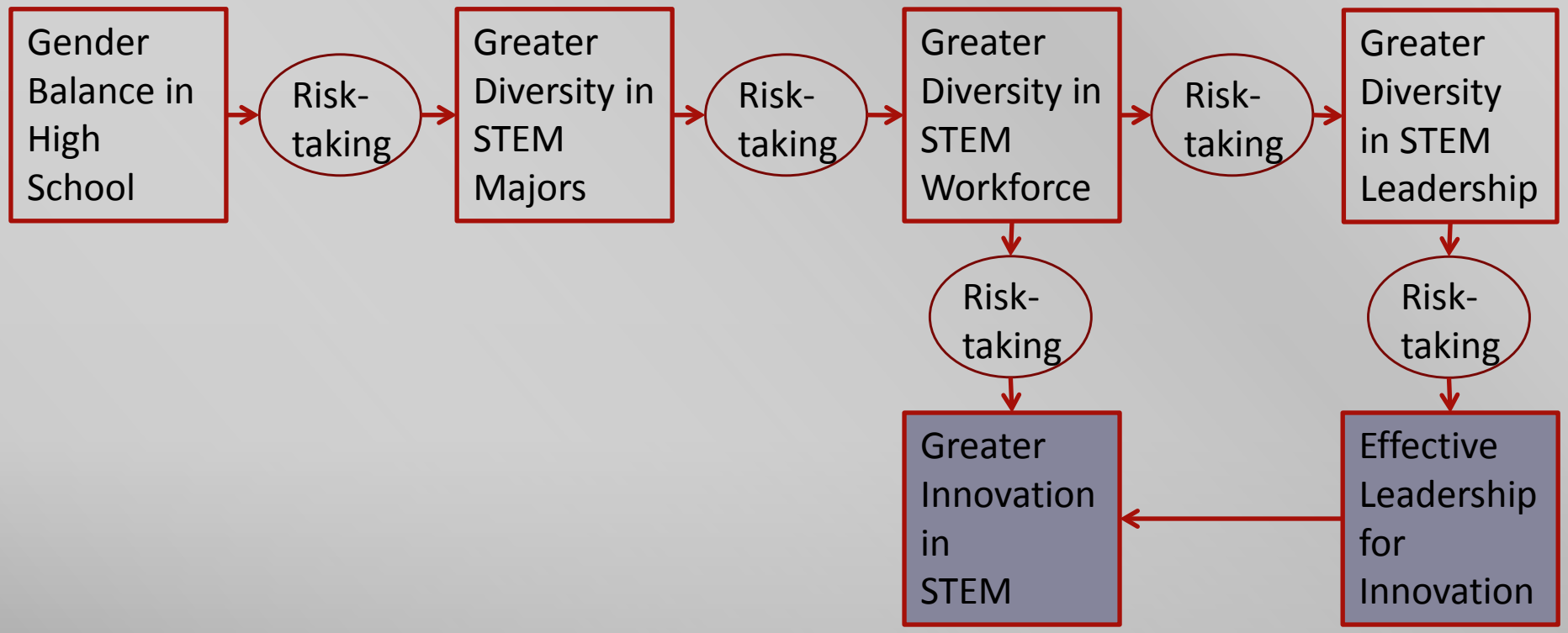


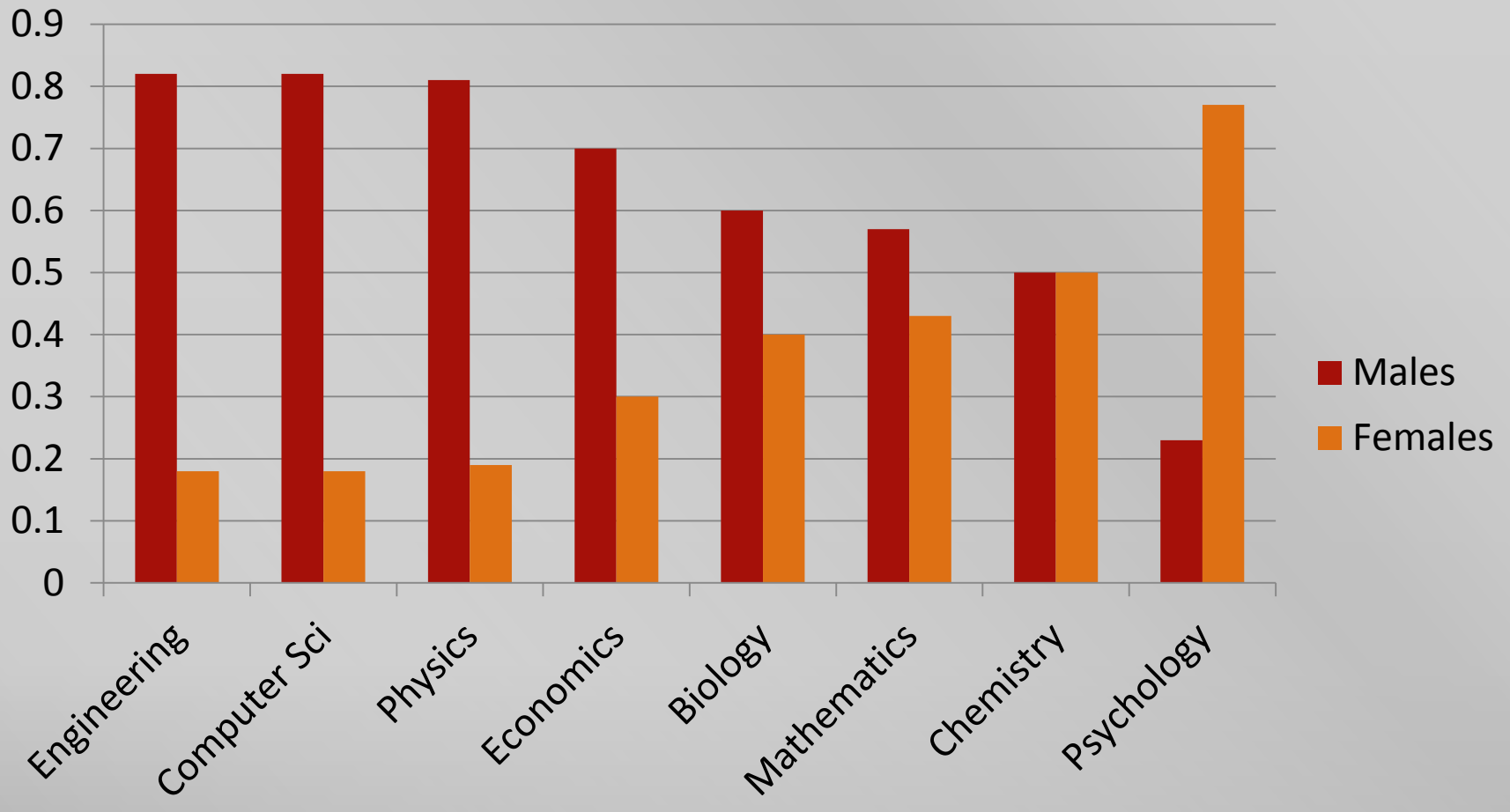
My Perspective

- My task: consider how risk-taking plays a role in the gender diversity of STEM workforce and leadership, and ultimately innovation in STEM
- Goal is to focus attention on key points in development where interventions to encourage risk-taking might make a difference to promote both diversity and innovation

Pipeline to Desired Outcome



Percentage of Science Bachelor's Degrees by Gender 2009



Source: National Center for Science and Engineering Stats, January 2012

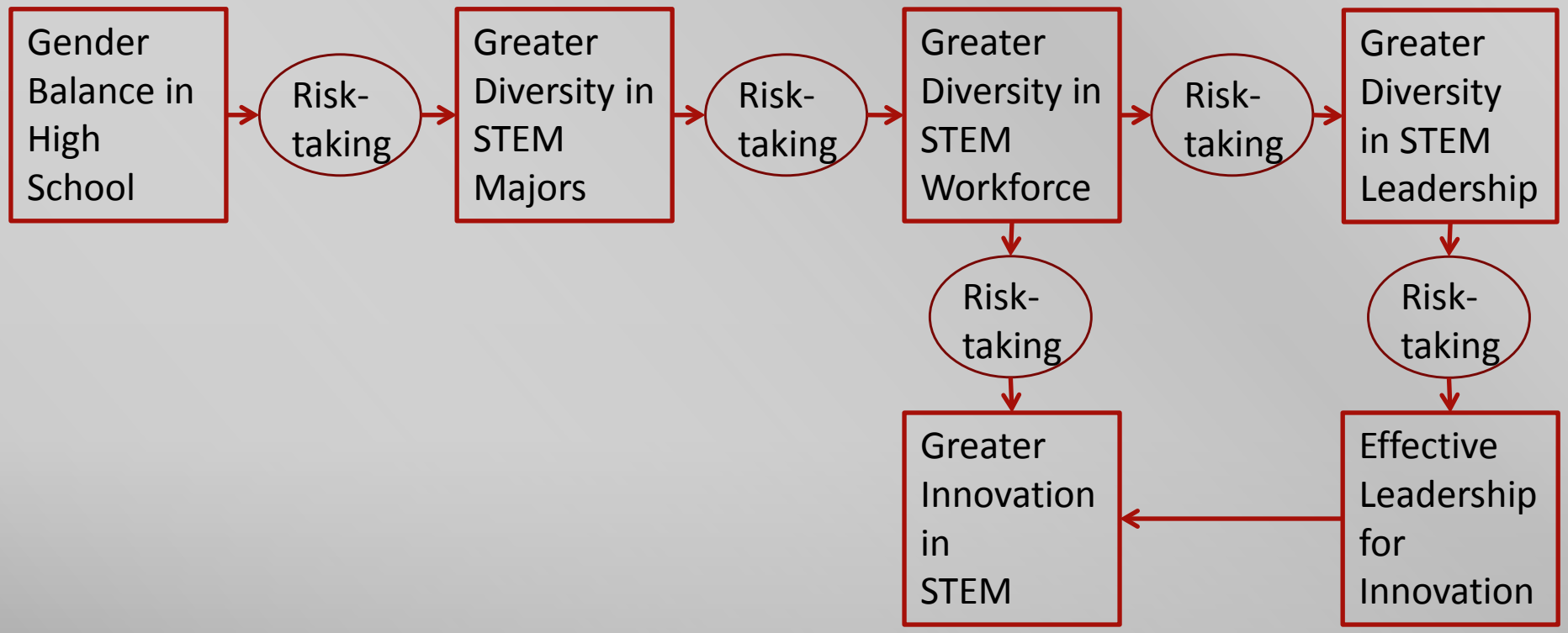
Clarifying Nature of Risk-taking

- All choices are risky at some level, but some actions more risky than others (more likely to lead to negative outcomes)
- Both positive (adaptive) and negative (maladaptive) forms; promote former, reduce latter
- Successful people regularly choose courses of action that are likely (but not certain) to lead to desired outcomes, and avoid courses of action that are likely (but not certain) to lead to undesired outcomes
- Successful people are not risk-averse, they are ***self-regulated*** risk-takers; this approach is learned, acquired by experience; so is risk-aversion
- Gender differences vary by topic; men are not inherently more inclined to take all kinds of risk
- But smattering of studies show males take more intellectual risks in STEM contexts; however, mixed-gender teams in simulated businesses do best

Key individual difference factors (Why some people take more risks than others)

- Expectations (including self-efficacy) regarding likelihood of positive and negative consequences
- Values about the desirability of positive consequences and undesirability of negative consequences
- Beliefs about one's ability as a scientist, constraints, roles
- Context appropriate use of self-regulatory strategies (advice seeking, emotion regulation, inhibition, initiation)

Pipeline to Desired Outcome



Experience, Socialization, and Risk-taking

- Traditional STEM classrooms do not promote risk-taking but rather the correct answer and replication of proper procedure; testing exacerbates this
- Reform and inquiry approaches are ideally suited to risk-taking but ruled out by time constraints and testing requirements
- Experiencing the consequences of choices should promote increased calibration of expectations (which lead to desired outcomes, which do not), but some students impervious to outcomes, some find mistakes too aversive, some get right balance
- Values about the desirability of outcomes are socialized by parents, peers, teachers, media; same for risk-taking; what is the payoff for choosing STEM majors, STEM careers, leadership roles and innovation? Worth the risks?
- Self-regulatory tendencies are learned and socialized
- Note how values and interest towards the helping professions (medicine, psychology) would motivate STEM majors of biology, chemistry, psychology, but also mathematics and science education