Do rock climbers seek out high-risk climbs?

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The sport of rock climbing is gaining international attention, having been approved for inclusion in the 2020 Olympic Games. But news headlines about the sport are still dominated by reports of gruesome injuries and near-death falls. Are rock climbers going out of their way to seek these risks? A new study published in *Risk Analysis: An International Journal* reveals that decreasing the level of injury risk at a climbing site

generates substantial welfare gains for climbers.

Risk of injury or death is an intrinsic part of rock climbing, whether done for sport or recreation, but not all climbers are thrill-seeking adrenaline junkies. The study, "Valuing the benefits of rock climbing and the welfare gains from decreasing injury risk," shows that these risks can heavily impact where individuals choose to climb.

The team of researchers, Lea Nicita and Giovanni Signorello, from the University of Catania, and W. Douglass Shaw, from Texas A&M University, applied the Kuhn-Tucker approach (conditions for an optimal solution in nonlinear programming) to estimate the demand for rock climbing in Sicily, Italy, to reveal the recreational value of various sites and the value to climbers of a reduction in injury risks. In addition to the degree of difficulty at the sites, climbers also consider length and quality of the climb, approach time, crowding and scenic quality, and travel costs, as well as variables that control for other unknown site-specific influences, when selecting a site to visit for climbing.

Thirty-two rock climbing sites located throughout Sicily were considered in the online survey distributed to Sicilian climbing groups on Facebook and via mailing lists from several climbing clubs. Ninety climbers completed the survey which asked questions about their place of residence, the number of trips taken to each of the 32 sites, self-reported climbing ability, experience, preference for sport or traditional climbing, whether they've attended training courses, are members of a club, whether they climb alone and their socioeconomic status. The average climbing ability of the respondents can be described today as handling routes of "moderate" difficulty, the equivalent of a U.S. 5.10 grade.

The researchers used knowledge of the climbing bolts and rope run-outs at each site to determine if a route was low, moderate or high risk. The distance between any pair of fixed bolts determines the level of

protection and risk as the climber can fall more than twice the distance he or she is above the last bolt. For example, a run-out of 10 feet between bolts may result in a 25-foot fall. While previous studies have explored bolting for sport climbing, they focus more on the environmental consequences of bolting, than the safety afforded to climbers.

The results revealed that a greater quantity of single-pitch routes, higher quality landscape and a lower level of median difficulty all increase the likelihood of climbers visiting the site. A statistical analysis of the responses indicated that the climbers preferred lower risk routes.

The researchers also estimated welfare values for each site to help inform policy maker who might set regulations regarding access to the site and to assess the recreational gains of investing in climbing routes to reduce the level of injury risk. Risk reductions at nearly every site can be achieved by improving the bolting of existing routes. If a policy were introduced to increase the level of protection for climbers, the resulting reduction of injury risk is predicted to generate a welfare gain ranging from $18 to $327, depending on the individual site. "The study has broader implications for assessing other risky activities (e.g., undertaking risky sports and forms of transportation such as biking, risky diets and behaviors) and the value of risk reductions for those," stated Nicita.

The researchers concluded that rock climbing sites with more routes and a better scenic view are more likely to be visited. Most notably, they found that climbers are more likely to choose less risky sites. While risk of injury from falling is intrinsic to the nature of the sport, there is a widespread misperception about the sport in part due to the media coverage and National Geographic filming of climber Alex Honnold, who free-soloed Yosemite Valley's El Capitan. The values for injury risk reductions revealed by this study can be compared to the cost of

increasing safety at a site which can be done by replacing old, worn out bolts and decreasing the length of run-outs.

More information: Lea Nicita et al, Valuing the Benefits of Rock Climbing and the Welfare Gains from Decreasing Injury Risk, *Risk Analysis* (2018). DOI: 10.1111/risa.13170

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