



Center for Research in Economics, Management and the Arts

**THE TIMES THEY ARE A CHANGIN':
The effect of institutions on behavior,
cooperation, emotional attachment and
sentiment at 26,000ft**

Working Paper No. 2013-10

CREMA Südstrasse 11 CH - 8008 Zürich www.crema-research.ch

THE TIMES THEY ARE A CHANGIN':

The effect of institutions on behavior, cooperation, emotional attachment and sentiment at 26,000ft

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Abstract

This paper attempts to determine if the introduction of a competing social institution has had a significant effect and shifted the pro-social behavior in the extreme (life-and-death) environment of mountaineering in the Himalayan Mountains over the last sixty years. We apply an analytic narratives approach to empirically investigate the link between death, success and the introduced social institution (commercialization). We use the Hawley and Salisbury (2007) Himalayan Database to determine if the introduction of this social institution is responsible for the decline in pro-social and altruistic behaviors. The results show that the change helping behavior is strongly correlated with the on mass introduction of commercialization. The results show a weakening of the prosocial behavior in the more “traditional climbers” in the modern period, created by a crowding out effect, which may have lead to the break down in prosocial behavior and the rise of anti-social behavior. Additionally, the results indicate that the prosocial behavior of the non-commercial groups in recent times may in fact be driven by the behavior of the Sherpa and not that of the climbers.

Keywords: Decision under Pressure, Altruism, Tragic Events and Disasters, Survival, Natural Field Experiment, Mountaineering.

JEL Classifications: D63; D64; D71; D81

Introduction

“It’s not about failure or success, it’s not about living or dying, understand that you have come to Everest to conquer yourself.”¹

Mount Everest is the jewel in the crown of the Asian subcontinent, the Himalaya, which as the highest point on Earth is a place of wonder and foreboding. It is synonymous with extreme mountaineering, creating a focal point for individuals who wish to challenge themselves in a test of human strength, endurance and personal fortitude. While mountaineering has never be considered a “safe” sport, in recent times its image and that of those climbing Everest has suffered repeated rebukes from the media and legends of the sport. The years 1996 and 2006 have become the most infamous seasons in Everest history, not just because of the record death tolls, but because of the storm of controversy that surrounded them². In 2006, 11 climbers lost their lives over a tragic six week period³, but what shocked the world was not the number of deaths but the manner in which they died.

On the 15th of May, a mere 300 meters from the summit, David Sharp sat just off the climbing route next to a shallow ice cave dying of hypoxia. Starved of oxygen in the rarefied atmosphere 8,500 meters above sea level, slowly drowning as his lungs filled with his own fluids and his arms and legs slowly turned to ice. While horrific, this type of death is not unusual for those brave enough to tackle the challenges of nature and altitude. What disturbed the world was not that he died or the manner of his death, but rather the actions (or inactions) of those on the mountain at the time. On his third (and self confessed final) attempt at climbing Everest, this mathematics teacher from England decided to go solo without either guide or Sherpa. David left Camp three (C3) early on the 14th of May for his summit bid, he was seen again later that night at approximately 8,400m by the ascending Turkish expedition at about midnight that same day. They inquired about his health and upon seeing his condition advised him to go back down, but he waved them away. Hours later when the Turk’s descended from the peak David was still in this position and while some of the team may have been inclined to provide aid, there was a problem unfolding in their own ranks. At this time a Turkish team member was in need of aid and understandably the Turkish expedition chose to help their compatriot. The primary concern here was not that they chose to help someone else, but that they misreported Sharpe’s condition. Upon returning to camp they reported that David was in an irrecoverable hypothermic coma - meaning that he was well beyond help. However, the following morning (8 hours later) Tharumalingam and his Sherpa from the Malaysian

¹Quote attributed to the legendary George Leigh Mallory.

²Story referenced from Bird, Lister, and Hussain (2008); Fickling (2006); Gillman (2006); Hawley and Salisbury (2007); Heil (2006, 2008); Kudas (2008); Krakauer (1997); Moreton (2006a, 2006b); Neighbour (2008); Salisbury and Hawley (2007); Unsworth (2000).

³The prime climbing season in spring runs from the start of March to the end of May, these deaths occurred towards the end of this period between the April 4th and May 25th 1996.

expedition reported that he was conscious, shivering, near death but still able to speak. The previous evening Tharumalingam has heard about Sharp's death and paid it no mind as there is little one can do for the dead. However, after descending from the summit at about 2pm on the following day (the 15th of May) he was shocked to see Sharp still alive when he waved his arm. How could a man in a supposed hypothermic coma spend the night at 8400m in the death zone, unprotected still be alive and talking unless his real condition was misreported? The reason for Sharp's misreported condition is unknown, it could be as benign as a misdiagnosis or sinister as a cover for an embarrassing lack of assistance offered by the Turkish climbers.

It was estimated that Sharp made the summit early in the afternoon of the 14th of May. Between this point and 2pm the next day (36 hours later) an estimated 40 climbers on their way to the summit walked past a human being in desperate need of aid with only a few rendering any form of assistance. Those who passed him on route to the summit seemed to have placed their own personal glory and conquest of the mountain before the needs of another human being. By the time Tharumalingam stopped to aid David in the afternoon it was far too late. By this stage he was so close to death that any attempt would be at recovery not rescue⁴ and even recovery would have been extremely difficult. Unfortunately, it was at about this time that Russell Brice (the leader of HimEX)⁵ gave the okay for a team to strike for the summit rather than to help, which further inflamed tensions. David Sharpe now rests in that shallow ice tomb just below the summit, beside the frozen corpse of the Indian climber (nicknamed "green boots") who nine years earlier suffered the same slow frozen death. In an interview with the London Sunday Times, Sharp's mother commented that ... "your responsibility is to save yourself, not to try to save anybody else" (Gillman, 2006). This was a courageous sentiment, and one to which some modern climbers would probably agree. What made this story more poignant was a similar drama that was to unfold only two days after Sharpe's death. However, this time many expeditions were coordinating efforts and were racing back up the mountain to save the life of Australian climber Lincoln Hall.

After reaching the summit, Hall had struggled for several hours to descend but had only managed to make it about 100 meters, at which point he ran into life threatening trouble. In his exhausted state he sat down and had become unresponsive, making it extremely difficult for his Sherpa to either move him or get him to move. Now as night was closing in and the temperature began to rapidly drop, the Sherpa who had stayed with him found their oxygen supply fast running out. The Sherpa made the decision to leave Hall behind and attempted to return in the dark freezing conditions lest they themselves ran out of oxygen and died on the slopes. Again the problem was not that a climber was left behind, but that their condition was misreported. The Sherpa reported that Hall had died upon the slopes and as such no attempt was made to rescue him that evening. Early the next day Hall was found by American climber Dan Mazur, sitting on the edge of a 1,000 meter

⁴At this stage Sharpe's physical condition (arms and legs frozen) and mental condition (delirious or unconscious) meant any rescue attempt would require a team to physically carry him down the mountain as he would not be able assist in his own rescue. Therefore, a stretcher would have to be slung between several climbers and man-handle his body off the summit.

⁵Himalayan Experience (HimEX) was set up by Russell Brice (NZ) in 1996 after 20 years of climbing and guiding experience and has been a major player in the adventure travel and expedition company in Nepal ever since and has a good reputation (record) for safety.

drop, sans shirt, hat and gloves. He smiled to Mazur and reportedly greeted him saying "I imagine you are surprised to see me here" (Heil, 2008, p.216). After radioing down that Hall was alive, a large coordinated effort was put together across many expeditions and over 11 Sherpa raced up the mountain with a stretcher and brought him down alive. Remarkably, Hall survived the night on the highest point on earth, in the death zone with neither oxygen nor shelter. Unlike Sharp a massive rescue operation was set into motion to retrieve him. For these two men, the similarities of the events are only eclipsed by the vast differences in outcomes, as they were only separated by a matter of days and the distance between life and death.

One could argue that the massive rescue operation was a knee jerk reaction to the death of Sharp just days earlier or it could just be that everything was in the wrong place at the wrong time for Sharp but right for Hall. In the weeks following these events, newspapers around the world exploded with accusations and scathing stories of neglect, criticizing that people were being left behind to die by uncaring climbers and expeditions. Who were only concerned about themselves or their own personal glory and the finger of blame was being squarely pointed at the commercial operators. Joining his voice to this chorus was the most famous western climber in Everest history, Sir Edmund Hillary. Hillary vented his disgust and contempt for those running tour operations up the sacred peaks, indicating that never in his day never would they have left a man under a rock to die (Fickling, 2006). But never in his day was there so much money to be made through the Contiki style (adventure tour) Everest expeditions. Where the only skill required of the clients was the ability to pay the exorbitant climbing fees, up to an estimated USD\$65,000 (Kodas, 2008, p.9). This violated the climbing ethic of the traditional climber (as demonstrated by the likes of Mallory and Hillary) where the objective of mountaineering was to test one's self in the crucible of the mountains, not for the attainment of personal glory. It would appear that in the age of commercialization individuals could buy a little glory, without having to endure the suffering, personal sacrifice and danger which are the true price of greatness. It would appear that these commercial clients were unfairly basking in the reflected glory of those who gambled their lives in pursuit of a passion.

This sentiment is reflected by many of the traditionalist, climbers like Juanito Oiarzabal, who holds the record for the most ascents of the 8,000'ers, said that Everest had turned into a "circus" where people are buying their way to the summit. Few of these so-called "cheque book heroes" are real climbers (Juanito Oiarzabal quoted in Moreton (2006b)). It would appear that the brotherhood of climbers and the deeply felt kinship between climbers appears to be gone. This is not to say that all cooperative behavior and sacrifice has vanished as was seen by the extraordinary sacrifice made by Spanish climber Juan Carlos Gómez in 1992. Gómez was mere meters away from the his dream of summiting Everest, when he encountered Rafael Vidaurre Garayo (also from Spain) on the Hillary Step, suffering from snow blindness after summiting. Gómez immediately turned around and lead his compatriot down to safety and by doing so gave up his chance to summit (Unsworth, 2000, p.534). It is also possible that we are looking in the wrong place when we talk about the disappearance of the "brotherhood of the rope", a case of not seeing the forest for the trees. Do all modern climbers belong to this "brotherhood?" If not, then are there special bonds or relationships that on casual inspection are not clearly visible that may affect the relationship between climbers or between climbers and Sherpa that could

affect behavior?

One must be careful in such situations not to make judgments without proof, but the weight of anecdotal evidence would indicate that there is a problem. But was Hillary right, has the commercialization of the mountain climbing brought about a change in behavioral attitudes towards and between fellow climbers? While the self-sacrifice behavior of Gómez is laudable, it is in stark contrast to the behavioral attitudes experienced by David Sharpe and Lincoln Hall in 2006. Additionally, it does not provide conclusive evidence of a shift in attitudes or cooperative behaviors in the modern climbing environment. For this, we need a more in depth analysis of the historical data. This is where behavioral economics can be of great use. In recent years behavioral economics has attempted to tackle the discrepancies observed between expected and actual behavior of individuals, as predicted by traditional economic models such as Homo Economicus. Although this model has proved useful in many cases, where individuals can achieve utility-maximization through exclusively pursuing their own material self-interest, it does not allow for motivation other than self-interest. Substantial evidence has been generated suggesting that non-selfish motives, such as altruism, fairness, and morality can profoundly affect behavior (see, e.g., Andreoni & Miller, 2002; Becker, 1974; Bolton & Ockenfels, 2000; Camerer, Loewenstein, & Rabin, 2004; Drago & Garvey, 1998; Dufwenberg & Kirchsteiger, 2004; Elster, 2007; Fehr & Schmidt, 1999; Frey, 1997; Rabin, 1993; Sobel, 2005; Torgler, 2007). Yet despite a mounting body of literature, very little work has been done to explore individual decision making in high cost environments or during life-and-death events (see, e.g., Frey et al., 2010a,b). This study seeks to reduce some of this shortcoming by empirically and theoretically investigating the impact of introducing a competing social institution into this extreme, highly dangerous, life and death environment and the extent to which altruism and pro-social behavior are affected⁶.

The historical nature of this study means that we are not provided with perfect information about events and can only create estimates based upon the available data, which are the outcomes of events not the event themselves. In an attempt to work around these limitations this study uses the narrative analysis technique (see Bates, Greif, Levi, Rosenthal, & Weingast, 1998) which considers the impact of strategic interactions, beliefs, cultural features and social structures on behavior using, for example, a classical game theoretic [or a behavioral] approach (Greif, 1998; Greif & Laitin, 2004). This paper investigates the historical development and nature of the social values and norms (pre-1950s) of traditional Himalayan climbers leading into the investigation period beginning in 1950 and their development into the commercial period (1988-2008). Furthermore, the extent to which these norms were initially self-enforcing but over time has become increasingly difficult to enforce. The approach is “analytic in that it extracts explicit and formal lines of reasoning, which facilitate both exposition and explanation” (Bates et al., 1998, p.10). The approach will be applied to demonstrate the importance of these norms to ensure altruism and cooperation between climbers in an environment where help means the difference between life and death. This system of norms worked so well that it may have been partially responsible for the introduction and explosion of commercial ventures to Everest and the other Himalayan peaks.

⁶So far most of the work has looked at the medical aspects of deaths, such as: Cogley, McKenna, and Allan (2006); Elmes and Barry (1999); Firth et al. (2008); Huey and Salisbury (2003); Pun (2009); Windsor (2008).

The altruistic and helping behaviors of the traditional climbers have undoubtedly helped to save the lives of many individuals over the years. However, it is these actions which may have made the probability of survival look much better than it would have otherwise been, attracting less qualified climbers or highly qualified climbers leading the unskilled on expeditions for a large fee⁷.

It may be that the commercialization process introduced a new competing social institution which has inadvertently led to the new social order weakening or destroying the pre-existing order within the original climbing fraternity. In order to determine if this was the case, we use the many detailed references and sources on mountaineering, Everest and the Himalayan Mountains to “seek to understand the actors’ preferences, their perceptions, their evaluation of alternatives, the information they possess, the expectations, they form, the strategies they adopt, and the constraints that limit their actions” (Bates et al., 1998, p.11). It requires that we “cut deeply into the specifics of a time and place, and to locate and trace the processes that generate the outcome of interest” (p.12). It allows to piece together the story where data limitations and holes are numerous. Overall, in line with many papers using analytic narratives this study is problem driven, not theory driven. However, it tries to understand the mechanisms that generate events. The empirical section allows us to go beyond narrative accounts of particular events increasing validity and therefore complementing the narrative element. Together, they contribute to a better completion of understanding environments where data gathering is challenging and incomplete. Thus we are able to explore the effect that the introduction of commercialization may have had on pro-social behavior.

Historical Development

*“Mountains are not stadiums where I satisfy my ambition to achieve; they are the cathedrals where I practice my religion.”*⁸

Numerous unsuccessful attempts to scale Everest were made between 1922, with the first official British expedition, and resumption of attempts after the Second World War in 1950⁹. The watershed moment came in 1953, with the success of Sir Edmund Hillary and Sherpa, Tensing Norgay which ushered in the “golden period” in climbing history. Although many individuals, expeditions and nations have competed for success and for a place in history the rivalry was neither cut-throat nor was it anti-social. The reality was quite the opposite. This was community of climbers who were for the most part well known to each other and regularly climbing through the Himalaya, all of whom were tied together by a deeply felt solidarity or shared culture, the so called Brotherhood of Climbers (see Heil, 2008; Moreton, 2006a). Over time there have been numerous successes, such that

⁷It could be that the less experienced climbers are just hiring more Sherpa to make up for the inexperience. However, contacting and hiring experienced guides and Sherpa is difficult without having prior contact and experience in the sport. Additionally, the commercial ventures have different packages (price and amount of hired help being negotiable). Experienced climbers criticize “short-rope” clients being dragged by Sherpa to the summit.

⁸Inscription taken from the memorial plaque to Anatoli Boukreev.

⁹Although the first official summit was in 1953, speculation still surrounds the 1926 attempt by George Mallory, who was last seen close to the summit and climbing well before being lost, his body was discovered in 1999.

the routes are well mapped and plotted and the equipment and techniques have greatly improved. All these factors have impacted upon the challenge of climbing, as “climbing protection . . . has grown so sophisticated that falling has lost virtually all its terrors and consequences” (Roberts, 2005, p.57). Such changes in the climbing environment could lead to the belief that there is a reduction in the need for aid and assistance for/from others. Which leads to the underlying question, why do we help others? This is a problematic and contentious question within nearly all areas of the behavioral and decision sciences. Do we act altruistically and help others¹⁰ from an innate sense of decency and for the common good or do we have a more primal motivation, one that only helps others from fear of social sanction and self-interest? The modern era has projected a very different set of attitudes and images of the climbing fraternity, than that of the traditional climbers. Heil (2008) bluntly summed up this new attitude by reporting: “Gone were the tweedy gentlemen climbers of yesteryear pioneering their way across virgin landscape; this modern, commercialized Everest was overcrowded and largely unregulated, a high-altitude playground where conga lines of novice clients clogged the routes, where deep-pocketed dilettantes of dubious ability were short roped to well compensated Sherpa’s and guides” (p.5). The modern fraternity appears more at home with ego, hubris and greed. How could such cooperative attitudes and behaviors develop to become the norm, when the environment do not appear conducive for altruism and helping behavior to survive, let alone flourish?

Social Norms and Institutions

Who were these “tweedy gentlemen”¹¹ and how did the Brotherhood of Climbers form or for that matter why did it dissolve? It is “widely agreed” that in the early years climbers were predominately wealthy, private school educated gentlemen (see, e.g., Cook (1978, pp.462-463) or Savage and Torgler (2010)), who followed the forms of gentlemanly conduct and sportsman like behavior. These men exerted enormous influence over future climbers by shaping the attitudes and norms for generations to come¹². These were not a group of random individuals who occasionally interacted. This was a group of people who are well known to each other and interacted often. This would also extend to include the Sherpa and locals who are also regularly in the mountains and interacted with the climbers. This brotherhood is in many respects similar to an extended family or community, individuals who are repeatedly interacting with each other, hold the same passions (climbing) and follow a shared set of beliefs. Many of the models of human behavior show that the way in which we behave is driven by our desires (or values) and our beliefs. The way in which we form our values and beliefs are derived via the influence of such factors as: moral and social norms, religious and political ideology. For an ad hoc community such as this, drawn from many different societies and nations, social norms would arguably be the most important. Social norms are the set of values and beliefs shared by societies’ members

¹⁰In line with Phelps (1999) we define altruism as “individual behavior that helps another at personal cost” (p. 17). However, there might be differences between the act itself and motivation behind the act (for a discussion see Frey, Savage, & Torgler, 2010b).

¹¹This description is a tautology, given that tweed is a fabric most closely associated with the England, Ireland or Scotland and the denotation of a gentleman is synonymous with being English.

¹²For discussion on the history of mountaineering, the cultural and social evolution of the sport see Cook (1978).

(for a full discussion see Durkheim, 1997; Elster, 2007), sometimes called the collective consciousness. These norms are the generally acceptable forms of behavior and attitudes under which a society functions, forming the social fabric of how individuals with that society are expected to act as well as providing the moral and ethical compass with which to navigate a societal existence without the need or force of law (see also Cialdini & Trost, 1998). The inter-relationship amongst individuals as defined by their roles and status is the social structure of a society and it is the interactions that define a society (Schooler, 1996). One could argue that actions and behaviors is driven from their belief systems, and are the physical manifestations of the way in which they interact with their social systems and are in turn linked to their emotions.

If a set of shared beliefs (or social norms) are strongly held over time they eventually became institutionalized (Frank, Meyer, & Miyahara, 1995), which then become much more than a loose set of common beliefs. The institutionalized norms can become the set of rules that governs behavior and social interactions for members of that social group. The process through which people learn the skills, knowledge, values, motives and roles of the society to which they belong is called socialization (Goldthorpe, 1998; Long & Hadden, 1985) and has a significant impact on values and beliefs (Inkeles, 1969). It is through the process of socialization norms are passed on the incoming members of that society (climbers), thus perpetuating and strengthening the norms (Caudill, 1973; Foucault, 1979; Frank et al., 1995). These norms are then enforced by the members of that society and are expected to be adhered to by all¹³. The sum of any culture or society, is greater than its behavioral parts and extends beyond the beliefs, norms and values of that social group and its interactions (see, e.g., Griswold, 2008). This is true for all societies, large and small, including all subsets such as mountaineers.

These “gentlemen” were a ubiquitous concept within British culture and while broadly acknowledged it is difficult to define, but has for centuries been engrained in the British psyche¹⁴. Given that the majority of early climbers were the gentlemen elite from Britain, the behavior of a gentleman was historically entrenched within these early climbers. An early 17th century tome (1630), aptly entitled *The English Gentleman* (Braithwait, 1994) provided a detailed and insightful look at the workings of the modern gentleman, including education, recreation and character, claiming that it is neither birth nor position that makes the man but his behavior and actions. The 18th century echoed the sentiment, “the appellation of Gentleman is never affixed to a man’s circumstances, but to his behavior in them” (Steele, 1955). By the end of the 19th century the gentleman had evolved from an aristocratic pursuit to the model for general behavior. The creation of the modern

¹³However, one must note that many of these norms may have been developed for the survival of the group rather than the for the benefit of any one individual within that group, which in extreme environments should promote pro-social over self-interested behavior (see, e.g., Eek, Biel, & Gärling, 2001). This could mean that cooperative and helping behaviors exist not because of a truly altruistic attitude, but from a need for reciprocity. Where individuals render aid to other not from the internal satisfaction it generates (warm glow) but from recognition that future aid may be dependent upon rendering assistance to others today. In the initial period of climbing the identification of a member of your social group was an easy exercise, as all climbers were expected to adopt and follow these norms.

¹⁴The gentleman has been evident in both society and literature for well over 600 years. One of the earliest literature references is the 14th century Canterbury tales (Chaucer, 1998) with the introduction of the gentil knight.

gentleman was the self-declared role of many educational institutions (Mangan, 1975) and the designation of gentleman became the ultimate achievement (Berberich, 2007) greater than any title that could be bestowed by kings or queens. Central to the tenets of being a gentleman was strict adherence to a code of conduct which included: deference and courtesy towards women at all times at any cost to self; politeness, civility and manners towards all others regardless of class or rank; honesty, generosity and faith; and above all else never act in any manner unbecoming to a gentleman.

This gentlemanly attitude could be clearly observed by the behavior of Englishmen during the sinking of the Titanic, where they stood aside and allowed all the available women and children to be taken to safety first at the cost of their own lives (Frey et al., 2010b). This ideal was viewed for centuries as the epitome of cultural/societal achievement, independent of class, wealth or title and actively pursued by those from beyond the traditional class boundaries. It is this selfless attitude towards women and others that could explain the adoption of the altruistic and helping behavior discussed in the early mountaineering norms. Gentlemanly behavior in this case would be to always render all possible aid to a fellow member of your own society when required regardless of the cost to oneself. These norms can be observed to operate under normal conditions and have in recent research been shown to operate under extreme as life and death environmental conditions (Frey, Savage, & Torgler, 2011a, 2011b). The norms followed by the members of any sub-society may invariable differ from those of general society, and on casual reflection can appear odd or suspect. This difference was eloquently summed up by an off the cuff remark to the media by George Leigh Mallory, which has become synonymous with climbing and Everest itself: "So, if you cannot understand that there is something in man which responds to the challenge of this mountain and goes out to meet it, that the struggle is the struggle of life itself upward and forever upward, then you won't see why we go. What we get from this adventure is sheer joy" (Mallory quoted in Heil, 2008, p.56).

Once norms are identified as being shared by other members of society they cannot be easily disregarded, individuals will follow the prescripts of a social norm even when it is clearly not in their own best interest to do so (Elster, 1989; Weber, 1930). It is this enforcement of the social norm by the individual and the group that makes it possible for individuals to take a course of action that would under other circumstances seem irrational. This behavioral enforcement is mostly achieved through either the coercion or shaming of individuals into the required action (Elster, 1998). Furthermore, commonly held social norms undergo herding type behaviors, where once a society member is observed conforming to a norm, others will automatically adopt the norm (see, e.g., Banerjee, 1992; Dong, Dulleck, & Torgler, 2012). It has been shown that following social and moral norms can have direct effects on behavior and survival outcomes for individuals who in a self-interested society would have perished, such as "Women and Children first" during maritime disasters (Frey, Savage, & Torgler, 2010a). Helping behavior is linked to altruism (Piliavin & Charng, 1990) as well as to reciprocity (Fehr, Fischbacher, & Gächter, 2002; Henrich, 2004; Oberholzer-Gee, Bohnet, & Frey, 1997). The basic underlying concept of reciprocity is to help those who have helped us. The reciprocal of this would be to harm those who have harmed us or to withhold assistance from those who need it, such as not rendering assistance to an individual who refused to aid you in the past ("an eye for an eye" so to speak). Wilson (1975) illustrates that when a population follows a series of social norms, the

reciprocated altruistic acts will increase individual members survival fitness. Additionally, individuals who attempt to cheat (e.g., those who do not respond in kind) will be treated detrimentally by all other members of that society when identified as such. This behavior is of vital importance in an environment where exogenous shocks (blizzards, avalanches or rock falls) are prevalent and helping behavior could save lives.

The social norms adopted through the institution of the gentleman and the concepts of challenging ones-self, has led to the concept of the traditional climber. The traditional climbers are most often lifelong climbers, who started climbing on their local peaks and built up in difficulty and height over time. They seek to challenge themselves and are likely to seek the next challenge or return to the one not yet finished. Thus, the traditional climber will regularly return and reciprocity becomes an important factor, such that refusal to render assistance could provoke retraction of aid in the future, which in such a hostile environment could be fatal. Research has shown that legitimacy has a significant effect on helping behavior, such that a legitimate need elicits more help than does an illegitimate need, such as one's own laziness or the lack of proper preparation (Berkowitz, 1969; Savage & Torgler, 2010; Schwartz & Fleishman, 1978). In the case of a natural disaster, people are confronted with an exogenous shock (one which is outside anyone's control), which helps to control for legitimacy issues (Frey et al., 2010b). However, many of the behaviors and attitudes are dependent on the identification of group status, especially in an environment with more than one social institution (e.g., class or caste societies). If helping behavior is based upon reciprocal attitudes, it is vital that individuals are able to identify members of their own group. Additionally, enforcement or retribution of norms is also dependent on the ability to identify an individual with a particular social group or institution. Identification and situation are highly important to eliciting helping behavior and how close one is to the victim (Piliavin and Piliavin quoted in Beil & Thøgersen, 2007, p.102). Schwartz and Howard (1982, 1984) indicates that while the awareness of the need for action is important, alone it is not a sufficient condition to ensure an individual's norm for a specific type of behavior (i.e. helping behavior) to be turned into action. Beil and Thøgersen (2007, p.107) indicate that in social dilemmas, individuals take several factors into account when deciding to take action, such as: the benefits and costs, situational framing, the behavior of others, need, communication as well as their own set of norms and values. This is supported by the findings of Rabbie, Schot, and Visser (1989, p.197) who indicated that in experiments where there was a perceived dependence on other in-group members, there is a significant level of favoritism towards those members. This is in line with the helping behavior in the modern climbing environment, where the reciprocal need for aid may be more likely given to those identified as in-group members, and less likely to others.

The development of the traditional climbing fraternity's social norms has done so alongside that of the locals, Sherpas and guides. Nearly all of the early successes and disasters occurred side by side with the support of the local populace, the Nepalese and Tibetan peoples. Over time and through repeated interactions the traditional climbers have built close and lasting relationships with many of those they hire to climb with them. There

was not only a lifelong friendship¹⁵ between Sir Edmund Hillary and Tensing Norgay¹⁶, but Hillary displayed a love for the people and returned many times to advance the living standards of the Nepalese¹⁷. The Sherpa were as integral to the setup of an expedition as any other member, such that on occasion when a particular Sherpa was not available expeditions were either delayed or cancelled. This is not to say that all climbers build the same relationship with the Sherpa, or react in the same way when tragedy strikes. On the 17th of October the 1986 Everest North Ridge Expedition (non-commercial) lost “one of [their] best loved Sherpas, Dawa Nuru” (Hawley & Salisbury, 2007, EVER-863-03)¹⁸ at 22,000ft while descending from the North Col. The team carried him back down for the proper Buddhist service, but afterwards sought to continue back up, only to be continually frustrated by the weather that had hampered the entire expedition. This is somewhat different to the attitudes displayed by the non-commercial climbers in 1994 Ukrainian expedition, who after the death of a comrade immediately called off the remainder of the expedition because their climbing ethics dictated that “climbing is not to continue after the death or disappearance of a member” (Hawley & Salisbury, 2007, DHA1-943-06). These incidents demonstrate a strong emotional attachment or sentiment between those who regularly interact with each other¹⁹.

However, it may be the case that with the commercialization of expeditions we may observe a different rational and behavior. Climbers who have bought a place in a commercial expedition are viewed by many of the traditional climbing fraternity as not having legitimate reason for being there. Which (as discussed earlier) research has shown to elicit lower levels of helping behavior. Heil (2008, p.5) summed up this attitude stating that the older more traditional climbers had long championed a keen sense of ethics and style, but the modern climbers did not at all represent this sense of self. They were deemed by many as being unworthy, defiling not only the mountains but their climbing way of life. They generally lacked the experience, dedication and training that a traditional climber invests through a lifelong involvement in the sport. Commercial climbers are thus viewed as being outsiders as they were not bound to the traditionalist’s social norms or values. Shotland and Stebbins (1983, p.36) point out that people have a need (innate or acquired) to help others in need, but also have a “hedonistic base.” They also weigh the benefits and costs to themselves in order to reach the decision to help or not and will be adversely affected by issues of

¹⁵The story of how Hillary and Tenzing became climbing partners apparently started the year before their epic triumph. Allegedly Hillary slipped and was potentially falling towards his death, when one of the porters put his own life in danger to save him, the porter was Tenzing Norgay. Ever since this incident Hillary made sure he climbed with Tenzing, the rest as they say is history.

¹⁶Tenzing was awarded the title of Sherpa for his efforts with Hillary and from this point on he was known as Tenzing Sherpa. The term Sherpa is multiuse, for while it literally means the “tiger people”, it is not limited to the description of an ethnic group as it is also a title and job description. This title/name is proudly worn by the Sherpa people, much like the term “gentleman” was worn by the English.

¹⁷Hillary and Tensing were acknowledged as the first to reach the summit of Mount Everest, although there was conjecture that Mallory may have been the first to reach the summit in 1926 but died on the descent.

¹⁸This reference number is taken from the Himalayan Database (Hawley & Salisbury, 2007). The specific identification number EVER-863-03 stands for the 1986 Everest expedition, climbed in autumn and was the 3rd expedition of that season.

¹⁹From an evolutionary approach one may argue that it may be the “save rule” that increases survival and that an emotional imbalance due to the death of a friend or group member may decrease the strength and endurance of individuals making it more difficult to survive this difficult trip.

legitimacy. The traditional climbers may likely take the view that the commercial clients do not have a legitimate reason to be in the mountains, which may be reflected in the traditionalist viewpoint that it is not their task to rescue individuals who have no business being there. Ultimately, it would appear that not only are the traditional climbers no longer bound by the strong social norms of their forbears and the need to be a strong reciprocator for possible future aid. Given that they (commercial clients) do not repeatedly climb and interact, they are unlikely to forge strong bonds or attachments with Sherpa or other climbers. This should result in a diminishing number of instances in the modern period of pro-social behavior. Behavior so often (anecdotally) observed during the early years of mountaineering in the Himalaya, where expeditions were halted to rush to the aid of another group in distress or stopped if a member died. If this was indeed the case then it should be easy to reconcile the volume of reports of selfish and self-interested behavior in recent times?

Baseline Model

The decision to provide aid is a snap decision that must be made on the spot by every expedition and climber, a choice that breaks down to providing aid or to ignore their plight and continue on towards their own goals. This is by no means a simple or easy decision. Once a decision to aid is made, then climbers need to make an additional choice on the continuance of their expedition. Furthermore, providing aid is not a costless act and may indeed cost the expedition their chance of success. Alternatively, the incident or conditions that put the victims in the need of aid may indicate that success on this day is impossible and turning back could be the better part of valor. The choice presented to climbers is the decision to act altruistically and provide aid or to act with self-interest and not to provide assistance. The situation begins with a state of nature, where the conditions facing the climbers is randomly determined, such as weather conditions (temperature, wind, snow etc.) and other exogenous events (ice falls, rock slides avalanches etc.). It could be argued that regardless of skill level, training/preparation or the events and conditions that occur during a climb are completely exogenous to the climber. More experienced climbers may be better able to predict some weather conditions but events like icefalls and sudden storms are beyond their ability. The skill (experience) of a climber can downgrade the conditions, such that a skilled individual could turn impossible conditions into very difficult or difficult into hard and so on. An unskilled (inexperienced) climber can make no such adjustment, so the conditions facing them are set. This is an additional cost that faces climbers who have not had extensive training or experience and all other randomly occurring events are unknown to climbers before beginning ascents.

The first decision point for all climbers is to decide whether or not to render aid after an incident. After this, the climber must then decide whether or not to continue on with the expedition or to stop. This decision is made irrespective of the decision to provide aid. There are several assumptions we have made in this decision process that need to be made clear. The first assumption is that if aid is not given then the victim could pay the ultimate price and dies if no other group is willing to help thereafter. This imposes a very large weight upon the aid decision, knowing that by choosing to not help will most likely result in the

death of those in need²⁰. A successful climber would receive the maximum utility (payoff), but survival must also have some benefit as climbers who fail to summit but survive can return again (or return to normal life) and would also receive some utility, albeit a smaller one²¹. This is best summed up by the motto in Viesturs and Roberts (2007) book “Getting to the top is optional. Getting down is mandatory.” We can also assume that climbers gain more information upon discovery of the incident. They gain some additional information which provides a fuller set of information on the conditions of a successful climb²².

An additional problem of rendering aid is the aid itself, it comes at a cost, where aid could include: physical aid, such as carrying the injured back down the mountain to lower camps, or equipment aid, surrendering oxygen or medicines to victims. Physical aid not only cost the expedition time and energy to turn around and go back down, but also includes the time spent actually getting to a stricken climber which in itself can be very dangerous and time consuming. Material aid is costly not only in monetary term but can have a major detrimental effect on the probability of success of an expedition, as the supplies carried by climbers are the bare minimum needed to summit and return. As a result climbers tend not carrying spare equipment (excluding possibly an extra oxygen cylinder) as every additional pound of weight makes success much more unlikely. Therefore, giving away of these scarce resources limits that climbers’ ability to successfully summit, under this assumption we impose a cost to success if equipment is given away. Additionally, there is also the likelihood of a social cost associated with not providing aid, there is a strong likelihood of retribution and retaliation by other members for those found not adhering to the social norms. This could be in the form of retraction of future aid or even ostracism from the climbing society. An example of this was observed with the Sherpas working for the highly unprepared and inexperienced 1994 Taiwanese Everest Expedition, while one of the climbers (Shih) lay dying at 8700m the Sherpas went to Camp 2 to retrieve tents, not to render aid. These Sherpas were censured by the climbing community never to be able to enter/work in Tibet again (Salisbury & Hawley, 2007, EVER-941-06). However, there are gains that could be made from the decision to provide aid even if the expedition is unsuccessful the climber would receive utility from doing the right thing (i.e. the warm glow effect). The amount of utility generated would be increased if the climber offers aid and is also successful, as the climber would receive utility from both the success and the warm glow. There may also be an effect here for the Sherpas, it may be the case that by rendering aid the Sherpas are able to improve their reputation with their clients or agency and be able to secure more work in future²³.

²⁰This problem would rapidly become intractable if there is always the possibility for those in need to survive without external help, which would be the case in non-extreme environments and circumstances that are not life-and-death. While in this case we assume that all incidents that require aid result in death if not provided, is not an overly large assumption.

²¹This attitude is in line with the traditional views on climbing. Being unsuccessful may not be seen as a failure, especially as they will return to test themselves again.

²²Until recently the cost of satellite weather reports was too expensive for all but the very well funded or state funded expeditions, this meant that climbers were not sure of conditions until they physically encountered them. Additionally, conditions regarding icefalls and avalanches were unknown until the first teams reached the areas susceptible to them. Thus if a previous expedition had encountered icefalls or avalanches, this would then increase the amount of knowledge the next expedition would have.

²³The companies and associations that govern trekking and Sherpas have in general fixed (set) rates for the hire of their services. However, well regarded Sherpas may not be paid at a higher rate but will be

The challenge comes when with the introduction of a second institutional group with its own social norms and attitudes, some of which may be in direct contradiction to those of the original group (traditional climbers). The attitude and beliefs portrayed by Hillary are clearly incongruous with those expressed by Japanese climber Hiroshi Handa. Who stated that “We climb by ourselves, by our own efforts, on the big mountains . . . above 8,000 meters is not a place where people can afford morality” (Heil, 2008, p.4). The conflict seemed to revolve around the core beliefs and attitudes of modern climbers being vastly different to those of the prior generations. Were Hillary’s observations correct, had the traditions and social norms of the brotherhood of climbers vanished or are the attitudes expressed by Handa the isolated anomalies?

Commercialization

“The client is trying to kill you, the client is trying to kill himself and the client is trying to kill the rest of the clients.”²⁴

Over the last few decades a profound shift has occurred in the basic makeup of expeditions attempting to scale Himalayan peaks such as Everest. Prior to the modern era, the majority of expeditions were supported either through scientific, government or were funded out of the individuals own pocket. The members of these expeditions generally consisted of experienced climbers. Many credit or blame Dick Bass as being the instigator of the commercial explosion. Bass was the first person to complete the so called seven summits²⁵ challenge in 1986 (see, e.g., Bass, Wells, & Ridgeway, 1986). What was interesting about this feat was Bass was an amateur mountaineer; he demonstrated that it was possible to summit the highest places on earth without years of training as long as you had the funds. The highly experienced climbers saw this as an opportunity to climb more often, by getting others to pay for their own expeditions through the sale of expedition spots. The following years saw an explosion of the commercial climbing venture (see Fig. 1). Even as the overall number of expeditions on Everest grew the proportion of the commercial expeditions grew as well, which currently makes up approximately 20% of all expeditions. This explosion was driven by experienced and well known traditional climbers. For example, Scott Fischer, a famous American climber and guide, created his own commercial expedition company, Mountain Madness, which advertised of their 100% success rate for the summit of Everest (Boukreev & DeWalt, 1997, p.6). Rob Hall, a New Zealand mountaineer founded his own commercial expedition venture called Adventure Consultants with a charge of USD\$65,000 for a summit attempt²⁶. Adventure Consultants was more expensive than many others but were noted for their reliability and safety.

Initially, these expeditions were made up of highly experienced climbers/Sherpas with only one or two commercial clients and these expeditions would have functioned and acted in a manner very similar to the traditional ones. Eventually, rather than single spots being sold

specifically requested by companies and most likely receive bigger tips.

²⁴The three rules of mountain guiding (Taken from the Rannoch Mountaineering Club, 2012).

²⁵The seven summits challenge was to climb the highest peak on each continent Mt. Everest (Asia), Aconcagua (South America), Mt. McKinley (North America), Kilimanjaro (Africa), Elbrus (Europe), Vinson Massif (Antarctica) and Mt. Kosciuszko (Australia).

²⁶One should note that both Fischer and Hall died in the 1996 Everest disaster.

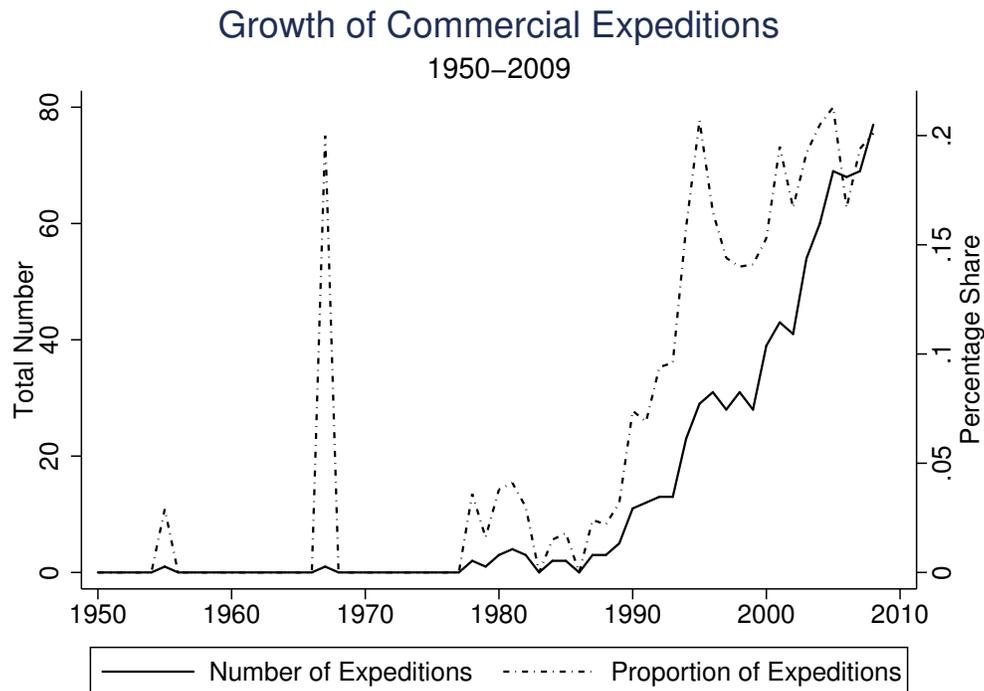


Figure 1. The growth of commercial operations from 1950 onwards.

Note: In 1967 there was only five expeditions upon Everest, one of which was a commercial venture, accounting for the commercial proportion spike.

off to fund an expedition, entire expeditions were being put together for the purpose of profit. These new expeditions consisted of a mix of individuals with a range of climbing experience and training (from little to none) with only the expedition leaders and Sherpas having any true mountaineering experience. In addition to the lack of experience, these climbers lacked the social and emotional attachment generated through personal interaction. Not only did they not know their fellow climbers, but they also had no relationship with those who were leading them. By 1996 the number of commercial expeditions was approaching 30 per year, where a decade before the total number of commercial ventures was 1-2 per year. The leaders and support staff (Sherpas) of these commercial expeditions were mostly highly experienced and competent climbers in their own right, which had been socialized through experience and exposure to the traditionalist view of climbing etiquette. However, these climbers were now guiding individuals with a completely different set of agenda and goals. Rather than a set of climbers looking for a challenge, they had a group of clients who have paid upwards of USD\$65,000 for a service, a C.V. entry as successful Everest summiteers. It might be easy to say that it is simply the lack of experience that is driving the problems associated with modern climbing. However, recent research by Westhoff, Koepsell, and Littell (2012) indicated that a lack of Himalayan climbing experience did not equate to a lower survival rate, as climbers were just as likely to die on their first expedition as any

other²⁷.

Hillary believed that it was the commercialization of climbing that was responsible for the degradation of pro-social norms and behaviors. While books such as “Into Thin Air” (Krakauer, 1997) and “High Crimes: The fate of Everest in an age of greed” (Kodas, 2008) focus on the disastrous events on Everest, they support Hillary’s view about the emergence of a seedy underbelly in both Tibet and Nepal’s climbing communities. These views were further supported in “Dark Summit: The Extraordinary True Story of Everest’s Most Controversial Season” (Heil, 2008, p.5), which describes how some Everest’s worst death tolls could be attributed to commercial cowboys and an abundance of anti-social behaviors. Unsworth (2000, p.534) also points out: “Nothing has excited as much controversy in recent years as these commercial expeditions.” The idea that the commercial operations that are to blame for the current state of climbing has been well supported in not only the popular press but also by many famous and respected climbers (see, e.g., Bird et al., 2008; Eagen, 2008; Fickling, 2006; Moreton, 2006a, 2006b; Neighbour, 2008; Venables, 2006, 2007).

If we assume that it was indeed the introduction of commercial operations that has led to the break down in the attitudes and behaviors in the modern climbers, how can we analyze such a resulting behavioral shifts? We can view the introduction of widespread commercialization as an institutional change, with a new set of social norms and members being introduced into the previously homogenous social system. Now we extend the basic model to include the commercial climbers and maintain the same structure (the choices faced by each group are the same). By doing this we can observe that the main difference between the commercial and traditional climbers is the motivation (goals and agendas) of each group and the cost of rendering aid. If we hold constant the climbers’ payoff for success (regardless of type) and the conditions experienced, we can assume that any behavioral changes could be due to the competing social institutions. But what is at the heart of the institutional difference and the competing social values? The traditional climbers are interested in testing (challenging) oneself. Reinhold Messner (1998) nicely summed up this drive stating: “In us all the longing remains for the primitive condition, in which we can match ourselves against Nature, have our chance to have it out with her and thereby discover ourselves” (p.40). This means that while traditional climbers are invested in each and every climb, they are not focused on only a single attempt and regardless of success they are likely to return for repeated attempts which create a social group dynamic and focus. Because they are not attempting to conquer the mountains but they derive utility from the struggle and through extreme discomfort and danger (Loewenstein, 1999) derive a sense of self (see, e.g., Akerlof & Kranton, 2000, p.717). This is not to suggest that the traditional climbers do not want success, but as the traditional climber see the test of self or the challenge as the objective, to summit is a bonus to be enjoyed but is not the sole objective (see, e.g., Drasdo, 1978). The mountain is the means not the goal. The results in repeated expeditions where individuals become part of the expedition and members become well known to each other over time.

This is vastly different for the commercial expeditions as they are groups in name only, as it is quite unlikely that any expedition members have met each other before arriving in

²⁷However, this study only provides a survival odds ratio at the individual climber level and does not provide a multivariate analysis at the group level (commercial vs. traditional). Nor does it take into account the shift in the skill versus caution perception. As climbers become more experienced they are more likely to undertake more difficult climbs believing their skill is sufficient and under value the risk (be less cautious).

Nepal. Furthermore, we can assume that the commercial climbers are not driven by the challenge, but by their own success and as such prefer to be in a one shot game (not having repeated attempts) and are unlikely to return once successful. This motivation can create an interesting set of internal and external group dynamics and issues. Firstly, these climbers lack the experience and training of the traditional climbers and therefore pay a premium to forgo this ability shortfall in the hope of purchasing success. The personal experience of Krakauer (1997) supports this view stating that: "It was clear to me . . . that none of us in the [commercial] group had a prayer of climbing Everest without considerable assistance from . . . guides and Sherpas" (pp.96-97). Secondly, clients have paid large amounts of money to join an expedition and therefore have high expectations of success. The expectation is that the payment of high fees will offset the lack of experience and training and this places high expectations of success upon the commercial operators. Given that the success of any expedition is partly exogenous (such as weather, health, incidents) in that there is no way to guarantee success let alone survival. One could argue that paying for success is a poor substitute for experience or training in a life and death environment where there is no motivation for others to save. This is especially true if you have built no emotional attachment to the other members of your expedition. Anatoli Boukreev, a guide and near legendary climber in his own right, indicated some of this perception variation in the guide's role: "I offer my expertise and experience for hire in order to help a group of people reach the summit. But am I responsible for whether they live or die? I am not" (Boukreev & DeWalt, 1997).

There is a large difference between being responsible for the lives of your clients and having a callous disregard for their lives. In 1996 Boukreev showed his willingness to race back up the mountains in an attempt to rescue others and render assistance, for which some hailed him a hero. He is credited for single handedly rescuing three climbers stranded above 8,000m after returning to camp after summiting without oxygen then returning to the peak for the rescue (Krakauer, 1997). However, this sort of behavior is not always the case, after reaching the summit in 1999 the Polish International Everest Expedition (a commercial venture) left behind Tadeusz Kudelski (POL) when he began moving slowly and is assumed that without help he fell to his death somewhere between 1st and 2nd steps. In response to this, Russell Brice (owner and operator of HimEX) said of the expedition leader Pawlowski that "...he only climbs for himself and close friends with no thought or consideration for clients abilities or needs" (Hawley & Salisbury, 2007, EVER-99131). In a way this is logical, Pawlowski had no emotional investment with his climbers (and possibly hired help), and thus was more likely to look after their own survival rather than others. This is a reoccurring theme from some commercial operators, as in 2004 Gustavo Lisi (ARG), the leader of a commercial expedition, abandoned his one and only client (Nils Antezana) after he became exhausted after summiting. Lisi's two Sherpas stayed with Nils until he collapsed, where they also abandoned their charge to die alone on the slopes. Ironically, Lisi fell into a crevasse, became buried and was forced to call out for help. The aid he so desperately required came from the Sherpas of Falvey's (IRE) non-commercial expedition who dug him out and provided him with their oxygen.

While the monetary cost of giving aid is the same for all individuals regardless of group, the consequential costs may be vastly different. There is a very large energy cost to carrying any additional equipment and as such only enough is taken to just make the

journey. Every piece of equipment given away has a significantly large negative effect on success. For traditional climbers this may be acceptable, but for commercial clients (who have paid a large fee and may not wish to return) their perceived cost is higher. While this could result in the clients not only having a more risk seeking attitude when it comes to climbing decisions, but may lead to very risk averse attitudes being held towards helping others²⁸. That is, the very large sums of money being spent by the clients makes them much more driven to succeed, as to fail is costly (dollar value) and may induce them into taking risks that they would otherwise avoid. This desire for success may also affect their willingness to provide aid to others, as any equipment given (oxygen, drugs or even guides or Sherpas) may result in them not being successful. This behavior is in line with the concept of *homo economicus* as rational self-interest. However, one should note that we are looking at an extreme and life-threatening environment. This is very much in line with the reports of an increase in negative behaviors in not only the base camps but during climbs such as: cavalier, corrupt and anti-social activities being reported in the press and publications. Because of these differences in motivation and attitude, commercial climbers are in general described quite disparagingly by traditional climbers. The traditional climbers spend a large portion of their lives training and working towards their expedition attempts, whereas the commercial climbers sweep in and try to buy success, which may engender division and an “us and them” attitude²⁹.

This attitude is summed up by (Campbell, 1978, p.288) in the emphatic statement about professionals who climb for profit “do not be a mountain pimp: Do not let the arm-chaired millions come at me.” This creates inter-group factionization with issues of legitimacy being a problem, resulting in two possible problems; Firstly the traditional climbers may harbor resentment and ill will towards the interlopers, as they are perceived as not having earned the right to be there (Heil, 2008, p.87). Secondly, commercial expeditions through inexperience and lack of training may put themselves at risk with an expectation of rescue from the more experienced traditional climbers. This is the classic moral hazard problem where the commercial climbers are willing to take more risks and act more dangerously as they believe that others will risk their own lives to save them. Prior to commercialization all climbers were governed by a single social institution where social norms of altruism, cooperation and reciprocity were the norm and that assistance would have been expected from any or all other climbers with the ability to render help. While only one social institution existed, the expected behavior would have been reinforced by members of this group punishing those who did not cooperate and behave accordingly. However, as pointed out by Heckathorn (1989), social norms that promote pro-social behavior, such as cooperation or helping behavior, erode if there is no stabilizing presence such as social sanctions or retaliation. This creates a problem for the traditional climbers as the commercial clients are not in a repeated game, the traditional climbers could face a tough situation, if clients die during climbs it has a direct effect on the number of clients in future. However, not being successful on an expedition leads to a similar effect. This leads to the situation where commercial expeditions need to continually be successful and

²⁸This is also consistent with prospect theory, where a loss has a much larger negative effect on the individual than the impact of same sized gain would have.

²⁹For a discussion on group social theory see, e.g., Hui and Triandis (1986); Nibler and Harris (2003); Triandis (1988, 1994).

safe to attract more clients. When conditions are unsafe the leaders decision whether to climb or not can both lead to bad outcomes for the future. This can be an especially large problem for commercial operations wishing to maintain an excellent safety record. While they may lose clients due to a lack of success this may be offset by keeping that safety record. However, it may be possible that the traditional climbers are still willing to render assistance (commercial climbers included) so as to maintain their own social identity, but this behavior will likely not be reciprocated by the commercial climbers. Over time, the lack of retaliation or sanction against commercial climbers makes it less likely for altruistic and pro-social behavior to be maintained³⁰.

Contrary to the anecdotal arguments, there are many cases where commercial teams and climbers have rendered aid and risked their own lives to save others as well as traditional climbers risking themselves to rescue commercial clients. In 2008, Uwe Goltz (SUI) became exhausted at the Hillary Step, his Sherpa Mitenjen stayed with him for 2 hours then got him down to the South Summit. At this point Jamie McGuinness (NZ), leader of a commercial expedition, gave Goltz an injection of stimulant and assisted to get him down to 8,500m where he was met by McGuinness team doctor. The doctor and others then assisted him down to 1,800 where Goltz unfortunately died of total body exhaustion. Here, we observe not only a commercial expedition helping others, they sacrificed some of their own medications and utilized their own team resources to provide aid³¹. On many occasions we observe Sherpas from other expeditions helping stricken climbers, either at their own behest or being directed by their respective teams. This may stem from the notion that the Nepalese hold the mountains to be sacred and would rather help than to leave the dead upon the slopes. However, there are also cases where the lack of attachment between client and Sherpas may be part of the problem. In 2001, Austrian solo climber Peter Ganner was observed going for the summit with his Sherpa (Phinzo) by Juan Benegas who decided to turn around due to the incoming bad weather coming. Later that night Benegas was told by Phinzo that Ganner had slipped and fallen to his death, because of this no attempt at rescue was made that night. However, the next day Pasang Gelu, a Sherpa from the Indian Military expedition, saw Ganner moving his hand just off the route. Ganner had no external injuries, but was suffering from severe frostbite. Gelu stopped to help but he died about 20 minutes afterwards. Gelu reported that no one stopped to help even though the body was only a short distance from the ridge³².

³⁰Additionally, the commercial climbers are in a one shot game and as such are unlikely (unable) to be in a position to reciprocate any positive act of altruism. Thus under a homogenous social institution we should observe stable norms of altruism, cooperation and pro-social behavior, but under heterogeneous institutions this becomes unstable and leads to a breaks down.

³¹However this argument may not be as strong as it appears as both victim and aider were from commercial ventures. Although McGuinness most likely follows the traditional climber norms as he had repeated interactions with others over time.

³²There may be an incentive problem for the climbing Sherpas. There is a shortage of available jobs and while dangerous trekking, guiding and portaging allows for a stable level of income. However, it is not automatically clear what the motives of Sherpas are in these environments. While they are hired specifically to perform a task (albeit a dangerous one), the question is, are they paid to risk their lives beyond the accepted risk of doing their job. An additional factor is the relationship between the Sherpas and client. If the Sherpas are just hired help, why would they risk their own life for a one shot client? There is no emotional attachment and the only social attachment between them is an obligation of doing the job that the Sherpas was hired for. This lack of attachment may be further weakened in an environment where there

Data and Methodology

The ultimate aim of this paper is to determine if the introduction of a competing social institution has had a significant effect and shifted behavioral norms over the last 60 years. We investigate Sir Edmund Hillary's claim that commercialization is responsible for the disappearance or at the very least a weakening of pro-social attitudes and behaviors. To do this we have chosen to investigate if there is a link between death, success and the introduction of a new social institution (commercialization). Towards these ends we have utilized the data from the Himalayan Database (Hawley & Salisbury, 2007)³³, which is based upon the Expedition Archives by Elizabeth Hawley. The data has covered the period 1901-2008 of which we are specifically interested in the 1950-2003 time periods, resulting in over 47,000 individual observations and around 5000 expeditions. For our multivariate analysis we have elected to use a probit model³⁴, due to the non-linear and binary nature of the dependent variable, which is a dummy variable indicating success or failure of the expedition (success = 1, failure = 0)³⁵. In this analysis we are only looking at deaths

is little chance of observing any negative or anti-social behavior from either party, weakening the pressure to follow the social contract.

³³See also Salisbury and Hawley (2007).

³⁴In this analysis we use a standard probit model:

$$Pr(y = 1 | x_1, x_2, \dots, x_k) = \phi(\alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k)$$

Here y is a dummy variable indicating whether the expedition was successful ($y = 1$) or not ($y = 0$), the variables (x_1, x_2, \dots, x_k) are explanatory variables such as death, injury, season etc. (see Table 1), ($\alpha, \beta_1, \beta_2, \dots, \beta_k$) are parameters to estimate, and ϕ is the cumulative standard normal distribution function. The role of ϕ , is to keep the probability $Pr(y = 1)$ in the interval between zero and one. We use a non-linear probability model because linear models are not bound and can generate fitted probabilities that can be less than zero or greater than one. In a binary situation this makes little sense, you cannot have a value greater than success (1) or less than failure (0). Each expedition contributes one set of observations on the (y, x_1, x_2, \dots, x_k). Each observation is assumed independent, from which the parameters can be estimated by maximum likelihood (Wooldridge, 2003, p.575-587). A further issue to be aware of in probit models is the results cannot be directly interpreted, therefore the need to calculate the marginal effect through the partial derivative:

$$\frac{\partial Pr(y = 1 | x_1, x_2, \dots, x_k)}{\partial x_j} = \beta_j \Phi(\alpha + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k)$$

evaluated at the means, where ϕ is the standard normal density function. Since $\phi > 0$, the sign of the marginal effect is the same as the sign of coefficients β_j . For a discrete x_j , a difference rather than a derivative is used in place of 1 – a change of the dummy variable from 0 to 1.

³⁵Measures of success are complicated within this environment, given the structure of expeditions and how summit attempts are made. Two basic structures can be in place: Firstly, all those who were designated as making a summit attempt could travel in a single group from the final camp to the peak. Alternatively, there may be a staggered approach made up of several small teams leaving at various time/group intervals ($t_1, t_2 \dots t_x$). In the first case, the team either moves as a group (at the pace of the slowest climber) or the start out together and get strung out as different climbing speeds and levels of fitness dictate the ordering to the summit. If the group becomes strung out, it then begins to look much like the staggered, multi-phase, multi-group attempts. It is this that causes the difficulty in determining "success" on a climb. If an earlier group (t_1) make the summit and then descend successfully, is this group impacted by the fatality that could occur by a later group (t_2) higher up on the mountain, but yet to make a summit bid? To look at the effect of a fatality on success it makes little sense to attribute a death of a later attempt (t_2) as having an effect on the success of the earlier teams (t_1). For the purposes of this study, if an incident occurred after a team successfully made the summit (t_1), which then resulted in the failure of the later group (t_2), the

and injuries that occur on the way to the summit. In this environment we expect that incidents that occur on the way to the summit should have an effect on the likelihood of the expedition being a success even if the death is that of a support member (Sherpa, porter etc.) and not a mainline climber³⁶.

We expect that there is a difference in the reaction to a death and an injury of a climber, while death is an easy and clear state to measure (one is either dead or not) the effect of an injury is much less clear. Injuries can range in severity from a simple cut or abrasion to acute mountain sickness (AMS), high altitude cerebral edema (HACE), high altitude pulmonary edema (HAPE) or strokes³⁷ and in many cases an injury does not mean that the climber must immediately stop or turn around and descend. In many cases the injured climber can be assisted to the next camp, where they will rest and await the return of the rest of the expedition who would then help them descend. In other more extreme cases the injury may be life threatening and may need immediate assistance from others to descend. This type of helping behavior is not as visible and is not noted in the data or the literature as often as fatalities. A loss of support would ultimately make the expedition much harder to succeed. To isolate the effect of death and injury on success we control for many factors across expeditions, individuals and mountains. A list of the descriptive statistics has been included for all variables in Table 1. Additionally, we recognize that it is possible that there are unobservable (but constant) factors that occur on each of the different mountains. To control for this we have clustered over the individual peaks. To investigate the effect of commercialization there are two clear periods of interest, pre- and post-commercialization, which has been determined by the introduction of large scale commercial expeditions. The takeoff of commercialization is observed from 1988 onwards (see Figure 1), thus the breakdown periods utilized in this paper are 1950-1987 (Pre) and 1988-2009 (Post).

All analysis has been performed at the expedition level. This means that variables are expedition averages, except for age which has been calculated as the size of the age differential (or standard deviation) in the expedition and the average age of members. The standard deviation of age shows the distribution within the expedition, whereas the average age shows the midpoint. The age distribution (SD) shows how similar in age the climbers within a particular expedition are. A large spread shows that the climbers are of very dissimilar ages and may not be a very cohesive group, whereas an expedition with a very small age spread demonstrates a very tight age banding and likely a better generational

success of t_1 would be excluded and the outcome of the expedition be recorded as failure. Alternatively, if a team successfully reaches the summit after the death of a team member this would be recorded as a success (1). These multi-stage, multi-team attempts mean that all deaths were individually assessed for time of occurrence and the outcomes after them. It is also very difficult to ascertain the exact location of the various groups when an incident occurs, as they are moving at different speeds and the ascent and descent trips overlap. That is t_1 may be descending after success, t_2 is making a summit bid and t_3 is moving into its final camp.

³⁶It is important to note that high altitude climbing is extremely taxing on the body, it is rare that climbers make multiple attempts on the peak once in the dead zone. When climber's aid injured climbers back down to lower camps it is unlikely that they will then immediately re-ascend as strike out for the peak. There are many limitations including: climbing permits (time), equipment (out of oxygen), climber's strength, endurance, etc.

³⁷We were not able to explore the relevance of the severity of injury due to the lack of information available of the degree of injury in the Hawley and Salisbury (2007) dataset.

understanding and higher cohesiveness. We observe from the descriptive statistics (see Table 1) that the non-commercial expeditions have not only a lower average age of members but have less dispersion. This would indicate that those climbers are younger and closer in age than those joining the commercial groups. This result is not unexpected given the cost of the joining a commercial venture is so expensive only those of higher means are likely to do so (as wealth is often a function of age). However, the age effect is difficult to predict, one could take age as a negative factor such that as one gets older the strength and agility fades, making it harder to succeed. Alternatively, another view could be to take age as an indicator of experience, as a climber gets older they have climbed much more often and are more likely to be more patient when observing conditions and routes. This could be indicating a higher level of risk aversion even, when inexperienced³⁸. Whether it is a loss in strength and agility or a gain in climbing experience and knowledge, age should be a strong candidate for impacting success. Additionally, the height of the mountain itself could have a major impact upon success. The higher the peak the greater the difficulty, and the truly huge 8,000m peaks are well into the death zone where the air pressure drops to levels below what humans are able to process and survive for any extended duration.

The weather is another factor that could have a major effect on the success of an expedition. While it is virtually impossible to control for the ever fluctuating conditions, we can look at the seasons in which they climb. Of the four seasons spring and autumn are the most preferable as summer brings a large number of storms (monsoon season) and winter temperatures dramatically plummet (blizzards and whiteouts), both making climbing extremely difficult. From this we have create a dummy variable for prime season, such that spring/autumn = 1. Additionally, the duration, size, make up and support of expeditions may also have a major effect on the probability of success, as each factor effectively determines the tradeoff between slow and steady progress and rapid setup and ascension. Climbers need to acclimate to the condition at altitude before they tackle a major peak, but every day spent at altitude saps strength and increases the possibility of problems and weather. The total number of days spent on the expedition can have a vast effect on acclimation and health, which in turn impacts success. The overall size of the expedition and the level of support staff³⁹ also directly affect the ability of climbers to be successful. For example, on average the commercial expeditions have smaller numbers than the non-commercial groups. This means it is important to have a control variable so we can hold the number of members constant in the analysis. Large numbers of support staff mean that the heavy loads are carried up to the advanced camps by Sherpas and not by those attempting to climb to the peak, sparing the energy and health of the climbers. Additionally, in the last phases of the climbs, when making a final attempt on the peak, having a climbing team or partners for support can make all the difference between success and failure. Furthermore, the size of the expedition group could have a significant effect on the capacity to provide help without having a significant effect on success. That is, larger

³⁸However, this is not a linear relationship as there is a tradeoff between experience and physical ability, while experience increases with age the physical strength and ability decreases.

³⁹Expeditions can have a large number of support/auxiliary staff, ranging from: Sherpas who are experienced climbers and guides usually at altitude (Sherpas can be included as part of the climbing team), porters are utilized to shift equipment to upper camps and to break down camps and bring equipment back down (porters generally are not accounted as members of the climbing team), there are additional member found in the Base Camp and Advance Base Camp such as doctors, cooks, medical staff etc.

groups might have the additional capacity to organize to go down or to send additional members back to the previous camp while the majority of the group continues on.

As a final set of controls, we attempted to control for modern equipment and expedition inexperience through the use of proxies (oxygen use and rope). Every extra kilogram of weight taken on a climb makes it exponentially harder to be successful, as such only a minimum of rope would be taken. Teams that take a large volume of rope could be seen as lacking in experience or wanting to be as secure (safe) as possible. Furthermore, the use of oxygen is a proxy for the advantages of the modern era and should mitigate some of this effect. We control for environmental factors in a yearly fixed effect manner, such that the environment (both wind and temperature), physicality (the mountain) and the dead zone are taken into account across yearly differences in weather conditions. The model we have used in this paper was constructed to reflect the most prominent and likely factors that would impact a successful outcome for an expedition in the extreme sport of mountaineering.

Analysis

If we begin with a very simple descriptive analysis of the effect of death on success it shows that there may be little merit to Hillary's comments. However, if we limit the sample, to only include expeditions where a death has occurred the analysis shows that after a death 58.8% of all expeditions do not succeed. This could indicate that the death of an expedition member has a large effect on the success of an expedition, due to either the expedition stopping to aid to the death or it may signal bad weather or conditions. However, this is also not the whole of the story, as we have two distinctly different groups of climbers. Once we include these different groups into the analysis a very different picture emerges. By splitting the data into commercial and non-commercial expeditions where a death has occurred, we observe commercial expeditions go on to record a successful climb in 80.6% of cases. This is not the case for the non-commercial expeditions, where after a death they are only successful 37.8% of the time. This rough analysis seems to indicate that a death on a commercial expedition does not appear to have an overwhelming effect on its success, whereas a death in the non-commercial groups results in them being twice as likely to fail. These results necessitate the need for a much more in depth analysis, utilizing better controls and period analysis, where we can control for time of death (ascending) and for period of time (pre- and post- commercialization).

We begin the regression analysis looking at the effect of a death or injury on success which has been split into the two basic analytical groups, non-commercial (1) and commercial (2) expeditions, across the entire period from 1950-2009 (see Table 2). However, specification (2) only runs from 1955-2009 as the first commercial expedition in this time frame did not start until 1955. Additionally, there is a long period of only a few commercial ventures during this period and it was not until the late 1970's that commercial ventures reappear. Due to missing values in either the starting or ending dates of expeditions, there are a number of expeditions for which we do not have a duration metric (about 20 percent). For this reason we have run the initial sequence of regressions in Table 2 with Duration excluded (1a & 2a) and with it included (1b & 2b) to check the robustness of the results. The most noticeable and key variable here is the very large and significantly negative effect that death and injury has on success in the first but not the second specification. This

Table 1
Descriptive Statistics - Expedition Level

Variable	Obs.	Mean	Min	Max
Number of Peaks	285			
Number of Expeditions	6,350			
Commercial Success	6,350	0.1213	0	1
(commercial)	770	0.7324	0	1
(non-commercial)	5,580	0.5002	0	1
Prime Season	6,350	0.9424	0	1
(commercial)	770	0.9753	0	1
(non-commercial)	5,580	0.9378	0	1
Death	6,350	0.084	0	1
(commercial)	770	0.0623	0	1
(non-commercial)	5,580	0.0872	0	1
Injury	6,350	0.0298	0	1
(commercial)	770	0.0227	0	1
(non-commercial)	5,580	0.031	0	1
Male	6,350	0.9173	0	1
(commercial)	770	0.8998	0	1
(non-commercial)	5,580	0.9197	0	1
Height (Km)	6,350	7.7919	5.55	8.85
(commercial)	770	7.8349	5.587	8.85
(non-commercial)	5,580	7.786	5.55	8.85
Duration (Days)	4,813	28.245	1	133
(commercial)	666	27.24	1	80
(non-commercial)	4147	28.41	1	133
Total Members	6,350	6.708	1	99†
(commercial)	770	9.247	1	34
(non-commercial)	5,580	6.358	1	99
Total Hired	6,350	2.713	0	99†
(commercial)	770	4.136	0	42
(non-commercial)	5,580	2.515	0	99
O2 Used	6,350	0.2447	0	1
(commercial)	770	0.3935	0	1
(non-commercial)	5,580	0.2242	0	1
Rope (km)	6,350	0.2175	0	8.7
(commercial)	770	0.2505	0	7
(non-commercial)	5,580	0.2129	0	8.7
Sherpa Deaths‡	6350	0.0228	0	1
(commercial)	770	0.0195	0	1
(non-commercial)	5,580	0.0233	0	1
Climber Deaths	6350	0.0690	0	1
(commercial)	770	0.0519	0	1
(non-commercial)	5,580	0.0713	0	1
Age (SD)*	5756	7.384	0	31.11
(commercial)	761	9.26	0	30.4
(non-commercial)	4995	7.10	0	31.1
Age (Mean)	6271	36.28	20	75
(commercial)	769	38.76	23.67	57.59
(non-commercial)	5502	35.93	20	75

Notes: † Members & Total Hired EVER-881-01 was state sponsored with a very large number of support staff - included were 14 Japanese, 14 Chinese & 14 Nepalese climbers, 12 support climbers, 15 Japanese TV crew, 12 additional TV crew to Lha La camp, 10 TV Sherpas, 5 journalists and 56 auxiliary staff (Hawley and Salisbury: EVER-881-01)
‡ The variable for Sherpa deaths is a dummy variable the specific death of a Sherpa, the reference group will be the death of any other individual, such as porters, aux. staff, etc.
* The number of observations in Age (SD) is reduced as SD cannot be calculated on a single value (solo or groups of two with a missing member's age).

Table 2
Baseline Models

	(1a)	(1b)	(2a)	(2b)
	Non-Comm 1950-2009	Non-Comm 1950-2009	Comm 1955-2009	Comm 1955-2009
Death	-0.718*** (-7.43)	-0.645*** (-5.71)	-0.257 (-1.30)	-0.322 (-1.53)
Injury	-0.271 (-1.27)	-0.243 (-0.23)	-0.086 (0.56)	-0.109 (0.45)
Height (km)	-0.087 (-1.99)	-0.014 (-2.38)	0.103 (-2.12)	0.098 (-2.65)
Prime Season	-0.244** (1.30)	-0.306** (1.65)	-0.451** (-0.58)	-0.630*** (-1.00)
Male	0.205 (0.82)	0.267* (1.05)	-0.166 (-0.48)	-0.256 (-0.72)
Age (SD)	0.186 (1.51)	0.164 (1.33)	1.456** (2.10)	0.968 (1.34)
Age (mean)	0.074 (0.10)	0.065 (0.23)	0.451 (2.16)	0.298 (1.77)
Duration (days)	0.0005 (0.0002)	0.001 (0.0005)	0.046** (0.0141)	0.038* (0.012)
Members	-0.002 (-0.56)	0.003 (0.71)	-0.041*** (-3.16)	-0.028** (-2.00)
Hired	-0.001 (1.55)	0.0013 (0.11)	-0.013 (1.43)	-0.009 (1.23)
O^2 used	0.014 (0.006)	0.001 (0.0005)	0.029 (0.009)	0.025 (0.008)
Rope (km)	0.004 (0.70)	0.007 (0.62)	0.039 (0.95)	0.038 (0.92)
Cluster	0.002 (5.37)	0.003 (4.79)	0.012 (4.95)	0.012 (4.95)
N	0.895*** (-1.38)	0.909*** (-2.02)	1.071*** (-3.77)	1.141*** (-3.87)
$P < \chi^2$	0.333 (-0.0195)	0.343 (-0.00003)	0.298 (-0.092)	0.317 (-0.0001)
Pseudo R^2	270	277	52	52
N	4838	3705	746	647
$P < \chi^2$	0.0000	0.0000	0.0000	0.0000
Pseudo R^2	0.064	0.066	0.138	0.145

Notes: t statistics in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001. Commercial expeditions did not begin until 1955 and were scarce until the late 1970's.

shows that a death in the non-commercial expeditions reduces the likelihood of success by 24.3%. Conversely, within the commercial ventures we see that not only is death not statistically significant, its marginal effect is almost 2.5 times smaller. When we compare the non-commercial specifications including and excluding Duration (see 1a & 1b) we observe very little change in the significance levels of the variables, even though we increase the sample size by over 1000⁴⁰. However, we observe the marginal effect of a death slightly reduces once we control for Duration. We observe similar effects in commercial specifications (2a & 2b) when we include Duration. With close to an additional 100 observations we see no changes in significance of Death on success⁴¹. Conversely, we observe an increase in the significance and marginal effect of Height with Duration controlled. Importantly, we observe no change in significance of our primary interest variable, Death in any of the 4 specifications (1a-2b). This could indicate that members of commercial expeditions are not as concerned about team members dying, as their focus is mainly on individual (personal) success. While this finding is interesting it is not a complete picture, especially given that commercial expeditions were not common until the late 1970's and did not take off until 1988 both of which are well outside Hillary's time. Additionally, these results do not indicate whether the introduction of the commercial institution has had a negative impact on the willingness of the traditional climbers to engage in helping or pro-social behavior over time. While Heckathorn wasn't specifically talking about climbers, his belief that the inability to punish norm transgressors should lead to a breakdown in the norms of a society should be relatable to the sub-society of climbers. We would expect to see the positive, helping or pro-social behavior being crowded out by the introduction of the competing social norm, leading to a decrease in the impact of death on success after the introduction. For this reason we need to extend the analysis and examine the periods independently to see if we observe the breakdown in behavior across time. Table 3 displays the results of this. The first three (3-5) specifications include the full sample of climbers and Sherpas, whereas the latter (6-8) only includes expeditions that reported not hiring Sherpas. Thus, in these cases death and injuries only emerge among the climbers. As the commercial period began in earnest in 1988 we have split the modern period in two, commercial and non-commercial. Furthermore, as there was no real commercialization until 1988, there is only one classification for the 1950-1987 periods (non-commercial).

When we break up the periods, we observe very similar effects to those in Table 2. The effect of a death remains robustly significant in both the 1950-1987 and 1988-2009 non-commercial specifications (3-4). Additionally, the effect of a death in the 1988-2009 commercial specification (5) still does not have a significant effect on success. Next, we explore how competing social institutions can effect behavior in specifications (3-4) and (6-7). Initially we observe no significant changes in the size or significance of a death on success for the non-commercial expedition between specifications (3) and (4). However, when we investigate just the climbers in specifications (6) and (7) we observe that the effect is statistically significant. In order to verify this crowding out effect, we looked only at the non-commercial expeditions and introduce an interaction term for deaths and period (results

⁴⁰We do observe that both Prime Season and Rope move from being just outside significance (10%) to being significant (at 10% and 5% respectively).

⁴¹We do observe a decrease in significance levels within Male, Age (SD) and Age (mean) when Duration is included.

Table 3
Period breakdowns

	(3)	(4)	(5)	(6)	(7)	(8)
	1950-87	1988-09	1988-09	1950-87	1988-09	1988-09
	Non-Com	Non-Com	Com	Non-Com	Non-Com	Com
Inc. Sherpa	Yes	Yes	Yes	No	No	No
Death	-0.625*** (-4.93)	-0.552*** (-3.63)	-0.326 (-1.54)	-1.006*** (-3.22)	-0.307* (-1.93)	-0.359 (-0.60)
Injury	-0.221 (-0.53)	-0.213 (0.38)	-0.11 (0.39)	-0.254 (-0.63)	-0.115 (1.69)	-0.14 (1.15)
Height (km)	-0.088 -0.543*** (-6.24)	0.031 -0.294* (-1.93)	0.083 -0.648*** (-2.76)	-0.120 -0.428*** (-4.20)	0.179 -0.250 (-1.46)	0.594 -0.655*** (-2.93)
Prime Season	-0.21 -0.038 (-0.21)	-0.117 0.300 (1.46)	-0.199 -0.250 (-0.98)	-0.147 -0.113 (-0.43)	-0.098 0.343* (1.78)	-0.261 0.075 (0.100)
Male	-0.015 0.462 (1.33)	0.119 0.122 (0.83)	-0.070 1.018 (1.39)	-0.040 0.543 (1.25)	0.128 0.308* (1.76)	0.030 0.933 (0.93)
Age (SD)	0.179 -0.024 (-1.19)	0.049 0.004 (0.68)	0.313 0.035 (1.59)	0.187 -0.028 (-1.34)	0.120 -0.009 (-1.20)	0.372 0.004 (0.08)
Age (mean)	-0.009 0.008 (0.44)	0.001 0.0001 (0.03)	0.011 -0.028** (-2.01)	-0.010 -0.002 (-0.11)	-0.003 0.012* (1.70)	0.002 0.005 (0.23)
Duration (days)	0.003 0.008* (1.73)	0.00006 0.007* (1.69)	-0.009 0.013 (1.32)	-0.0008 0.009* (1.86)	0.005 0.005 (1.01)	0.002 0.034** (2.13)
Members	0.003 -0.008 (-0.96)	0.003 0.016 (1.48)	0.004 0.023 (1.06)	0.003 0.005 (0.31)	0.002 0.021** (2.21)	0.014 0.032 (1.14)
Hired	-0.003 0.042*** (3.64)	0.006 -0.004 (-0.39)	0.007 0.039 (0.93)	0.002 (0.005) (-0.24)	0.008 -0.090*** (-3.26)	0.013 -0.036 (-1.06)
O ² used	0.016 0.402** (2.28)	-0.002 0.936*** (4.22)	0.012 1.108*** (4.95)	-0.002 -0.347 (-1.58)	-0.035 0.604*** (3.93)	-0.014 0.0252 (0.06)
Rope	0.158 0.083 (0.92)	0.348 -0.114*** (-2.61)	0.309 -0.341*** (-3.93)	-0.109 0.119 (1.17)	0.237 -0.100 (-1.28)	0.01 -1.168* (-1.86)
	0.032	-0.046	-0.105	0.041	-0.039	0.466
Cluster	127	177	38	98	144	29
<i>N</i>	717	2988	639	426	1747	167
$P < \chi^2$	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pseudo <i>R</i> ²	0.093	0.072	0.144	0.08	0.04	0.101

Note: t statistics in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001.

not shown here, but available on request). The interaction term is statistically significant at the 5% level within the non-commercial expeditions⁴². That is, we observe that the effect has strongly decreased. These results indicate that we cannot reject our hypothesis that the introduction of a competing social norm results in a significant crowding out effect of the traditional social norms and values. The results do support the anecdotal evidence presented in the many books and articles written about the modern climbing ethic and behavior. This provides indirect evidence that introduction of the commercial clients has had a crowding out effect of the helping and pro-social behavior previously observed in the 1950-1988 period. The results lead to the question why the crowding out behavior not visible in the full sample (specification 4).

In order to better understand the effect that Sherpas have on expeditions we extend this analysis to investigate these same variables in the expeditions that do not use Sherpas⁴³ as seen in specifications (6) and (8), and still include the same commercial/non-commercial designations and time period splits. In the first of these new specifications (6) we observe very little variation in the results to the complete sample in specification (3). The most interesting results occur when comparing the impact of a death across specifications (3-8). Between specifications (3) and (6) we observe very little change in significance, magnitude or sign, which would indicate that with or without the Sherpa a death in this era has a significant impact. If we now compare and contrast the results of specification (3-4) and then (6-7), we can observe a large decrease in the size of the effect of a death on success. In the full sample we observe no drop in the marginal effect (3-4), but in the reduced sample (6-7) we observe a drop in significance and magnitude of about 10%. One possible reason for this could be the presence of the Sherpas, which are included in specifications (3-5) but not in (6-8). This could indicate that it is the Sherpas that are maintaining the pro-social behavior, which is in line with much of the anecdotal evidence on Sherpa behavior and climber attachment⁴⁴. In addition to the crowding out behavior within the non-commercial groups, we observe that the impact of a death on the success of a commercial expedition is non-significant on either the full or the reduced sample (5 & 8). The results do not vary in significance levels when we remove Duration from the regressions, there was a slight increase in average size of the marginal effects for the non-commercial specifications (3, 4, 6 and 7) of an average of 2.5%. This empirical evidence would support the notion that the introduction of the commercial institution has indeed crowded out the attitudes and behaviors of the traditional climbers.

Additionally, we observe a drop of significance in the effect that the number of hired members has on the probability of success, which again this makes perfect sense, when considered from a historical perspective. This also makes it very clear the vitally important

⁴²For robustness we check the results using both probit and linear probability model, both of which report very similar results. This further suggests that the introduction of the competing social has crowded out the pro-social behavior in the non-commercial groups.

⁴³This does not exclude the hiring of porters to carry equipment up to camps.

⁴⁴In many of the high altitude rescues it is the Sherpas who are seen racing up the mountain to bring down the injured and stranded. In 2006 when Lincoln Hall was found alive after spending the night alone on the summit, 11 Sherpas raced up to provide aid and bring him down safely. In many stories about long standing partnerships between climbers and Sherpas, when a climber has fallen, the Sherpas refuse to leave. Staying with the stricken climber, knowing that it is useless and they are surely going to die but refusing to leave them alone.

role that Sherpas played in the success of the early expeditions in the Himalaya. The modern 1988-2009 non-commercial climbers without Sherpa support, as seen in specification (7), are very similar when compared to the full sample (4). However, here we observe a very strongly significant effect from the number of members on the expedition. It would appear that without the aid of the Sherpas non-commercial expeditions are more successful if they take larger numbers, effectively replacing the Sherpas with other climbers. The effect of taking away the Sherpas is most noticeable in the commercial ventures. Rope, oxygen and mountain height no longer has a significant effect on success. The effect of death is still not statistically significant (5).

The results also reveal some other areas of interest. For example, what we observe in the results seems to support the anecdotal evidence discussed in the recent climbing literature in regards to the climbing ability of commercial groups. In the early climbing period 1950-1987 (see specification (3)) we observe that the height of the mountain has a strong, negatively significant effect on the probability of success⁴⁵. This would mean that for every additional 1km in height attempted by expeditions, above the average (7.78km), results in about a 21% drop in the probability to succeed. This equates to climbers in the pre-commercial period being upwards of 34% more likely to succeed on Annapurna Dakshin (7,219m) than they were on Everest (8,848m). Also in line with anecdotal evidence, we observe that this effect has been significantly reduced for the modern non-commercial expeditions (4), but remains strongly significant for commercial expeditions (5). Here we observe that for each 1km in height in the modern period above the average (7.78 for non-commercial and 7.83 for commercial) results in a drop in success probability of 11.7% and 19.9% respectively. The asymmetric result may be indicative of the lower skill levels in the commercial expeditions, as they suffer a more significant and greater success reduction than that of the non-commercial groups. The effect is robust in almost all specifications, the exception being (7) where we observe that the modern non-commercial climbers (excluding Sherpas) are not at all affected by the mountain height. This could be attributable to lack of knowledge (routes) and poorer climbing equipment used in the earlier period, but this does not explain the modern commercial expeditions. However, it may be that the climbers within the commercial expeditions are the differentiating factor here; these climbers do not have the same levels of training and experience as their counterparts in the modern non-commercial ventures. It would therefore make sense that the lack of experience on the high peaks is significantly affecting the success of the commercial climbers.

Another interesting point is the effect that the number of hired members has on success in the 1950-1987 periods in specification (3). Here we see that hired members have a significant positive effect on success. The probability of success increased in this period by 1.6% for each hired member above the average (2.5 hired per expedition). This would mean that for every 10 Sherpas/porters/guides hired it would on average increase the probability of success by 16%. This result would be understandable in the early years of climbing (see specification 3), where the expertise and knowledge of the local Sherpas and support of porters was critical. We would expect that over time the importance and significance of local Sherpa knowledge would be mitigated, as the climbers became more knowledgeable, skilled and the technology was improved. We do observe this in the modern

⁴⁵This early effect is unsurprising as routes had not yet been mapped and equipment was still crude.

period specifications as the number of hirelings are no longer a significant factor on success. An interesting note is that in specification (7) without the Sherpas included in the sample we observe a significant, but negative effect of each additional hireling on success for the non-commercial expeditions. This could indicate that the Sherpas knowledge and skill have a large impact on the expeditions, such that hiring lower skilled or non-Sherpa replacements is detrimental to success. This finding provides additional support of the vital role played by the Sherpas in non-commercial expeditions and the links between the two groups. A final point of interest is the hypothesis we posed that the use of large quantities of rope could be a proxy for poorly experienced expeditions. What we observe here supports that idea. The coefficient Rope is significantly negative for the modern (1988-2009) expeditions in specification (4 & 5). For every 1km of rope taken by these expeditions above the average (2.1km for non-commercial and 2.5km for commercial), there is a decrease in the probability of success by approximately 4.6% and 10.5% respectively⁴⁶.

Overall, these results would indicate that it is the introduction of the commercial institution that has led to the belief that pro-social behaviors are being weakened. However, these results must be treated with some trepidation and not be accepted at face value. A much more detailed investigation of attitudes and behavior of climbers is needed to validate these results. What we are observing are the outcomes of events in an uncontrolled environment, with little or no eye witness verification. This is a historical study which is very close to a natural experiment, given the rapid emergence of commercialization, and while we do not have as much controllability as a laboratory there is a distinctive gain in environmental reality. Much more research needs to be done in this area to extend our knowledge and understanding of the environment and the participants themselves.

Alternative Explanations

Analytical narratives are used to work around the shortcomings that can occur when attempting to utilize historical data. As with the use of natural experimental data the studies are performed after the fact and not all the pertinent data may have been collected or recorded at the time, which can result in data gaps and unobservables. However, even with the data limitations the analytical narratives approach allows the researcher to piece together the story which would have otherwise been impossible. The shortcomings of a narrative analysis stems from its advantage as an analytical tool, the lack of observational data means that its analysis does not provide solid evidence that would be easier to achieve with a stronger dataset. Our results do not reject the notion that the introduction of commercialization created a competing social norm that has changed the attitude of climbers. The question remains whether this is the only possible explanation of the results. We must acknowledge that over the span of 60 years, there have been many knowledge and technological changes to the sport and the region. This would include more available infor-

⁴⁶The use of rope as a proxy for skill is complicated. On the one hand we could say that the less skilled expeditions would need more rope and that the skilled climbers do not need as much. However, in recent times the commercial operators have tried to arrange for all the fixed ropes to be placed at the start of a season and the cost shared between all the groups. The problem being that once in place it is a public good and it is neither excludable nor rivalrous, and may prompt some expeditions to free ride. It could be argued that it is the lower skilled commercial clients that are the recipients of the greatest benefit of the fixed ropes and in this light it may indeed be a good proxy for ability.

mation on successful expeditions, better weather forecast and better training techniques. We would expect to see an improvement in the quality and availability of equipment utilized by climbers. These improvements would not only improve the ability of the climbers but also the survivability⁴⁷. Just like we observe in most other sporting fields, improvements in clothing and equipment result in the breaking of records and better preparation for the challenges. Additionally, these improvements can make the difference between freezing to death before help arrives and staging warm enough live until aid arrives. If this were true we would expect to see a decrease in the number of deaths for all of the modern periods (commercial and non-commercial). What we do observe is a steady decrease in the number of deaths per climber (or expedition) over the modern period, but the death/success relationship remains different between commercial and non-commercial expeditions⁴⁸. Another possible change over time could be the improvement in route information, which one would expect to only be available to the traditional climbers, giving them an advantage. However, the commercial expedition leaders, for the most part, come from the traditional group and would have access to the same information.

In the modern era, with all the advances, it is possible that climbers choose not to join a commercial group, but instead opt to directly hire Sherpas for themselves for a “solo” expedition. While this is possible the pricing structure for climbing permits make this extremely expensive. While the Nepalese Ministry for Tourism is in charge for the fees the prices for permits fluctuate often. The recently listed cost of a sole climber, on a common route on Everest is USD\$25,000. This cost is only for the right to climb and does not cover any services or extra that will most definitely be needed for such an expedition. More often than not, climbers who wish to attempt a solo climb and hire their own Sherpas are most likely to do a deal with a commercial venture. They will be included on the commercial permit (for a price) and then left to their own devices. While this does appear to happen quite often, the consequences of a problem arising can be quite large. There is no support team beyond the hired Sherpas, if something goes wrong others do not know to look for you or where you are supposed to be. Additionally, if the Sherpas dies then the climber is left without any support at all⁴⁹.

An additional and possible explanation for some of our results could come from the nature of the relationship observed Sherpa to client and climber to climber. One would expect that the traditional climbers should have a strong bond with other traditional climbers, given the repeated interaction. This interaction creates an emotional attachment; this could result in a higher willingness to render aid or coming to the assistance of another traditional climber. This should also be the case with Sherpas who have repeated interactions with traditional climbers; they should be more likely to come to the aid of those in need, especially those with whom they have interacted over time. Alternatively the lack of interaction that the commercial clients have with either Sherpas or each other could be a recipe for disaster if the emotional attachment effect is lower. These are less experienced

⁴⁷However, these improvements would be equally available for both groups of climbers and it is unclear if these factors would have a significant effect on the decision to stop and help.

⁴⁸This line of reasoning should also hold for advances in rescue equipment, as this should rescue both groups of climbers equally. However, this could explain the change over time among non-commercial groups.

⁴⁹One must be careful in the analysis of this. These are effectively solo climbers and can occasionally be listed as commercial depending on the nature of the permit they end up using to climb.

Table 4
Expeditions with the death of a Sherpa

	(9)	(10)	(11)
	1950-1987	1988-2009	1988-2009
	Non-Com	Non-Com	Com
Injury	-0.182 (-0.42)	-0.080 (-0.39)	0.223 (0.33)
	-0.070	-0.032	0.068
Height (km)	-0.547*** (-6.20)	-0.294* (-1.93)	-0.646*** (-2.77)
	-0.211	-0.117	-0.198
Primary	-0.034	0.301	-0.241
Season	(-0.19)	(1.47)	(-0.95)
	-0.013	0.119	-0.068
Male	0.438 (1.26)	0.124 (0.85)	0.983 (1.33)
	0.169	0.050	0.302
Age (SD)	-0.023 (-1.12)	0.004 (0.71)	0.035 (1.59)
	-0.009	0.002	0.011
Age (mean)	0.006 (0.36)	0.000003 (0.00)	-0.029** (-2.14)
	0.002	0.000001	-0.009
Duration	0.007 (1.53)	0.007* (1.67)	0.013 (1.26)
(days)	0.003	0.003	0.004
Members	0.006 (0.67)	0.016 (1.44)	0.021 (1.02)
	0.002	0.006	0.004
Hired	0.048*** (4.07)	-0.005 (-0.50)	0.041 (1.04)
	0.019	-0.002	0.013
O^2 used	0.378** (2.13)	0.939*** (4.19)	1.106*** (4.71)
	0.149	0.349	0.309
Rope (km)	0.079 (0.88)	-0.114*** (-2.60)	-0.343*** (-3.92)
	0.031	-0.046	-0.105
Climber	-0.522*** (-3.43)	-0.543*** (-3.33)	-0.111 (-0.39)
Death	-0.186	-0.210	-0.035
Sherpa	-0.695*** (-2.76)	-0.786* (-1.88)	-0.390 (-0.56)
Death	-0.233	-0.289	-0.134
Sherpa and	-0.587†	0.859	-0.320
Climber Deaths	(-1.55)	(1.43)	(-0.52)
	-0.201	0.300	-0.108
Cluster (Peaks)	127	177	38
N	717	2988	639
P > χ^2	0.000	0.000	0.000
Pseudo R^2	0.101	0.072	0.145

Notes: t statistics in parentheses * p < 0.05, ** p < 0.01, *** p < 0.001.

The reference group for Sherpa Death and Climber Death is no deaths of a members of the expedition. † The result for Sherpa and Climber Deaths is close to being significant, but this could be driven by the small number of observations (78) where both climber and Sherpa die.

climbers among the non-commercial group of mountaineers with no normative bond with those around them. This we see in all of the modern commercial periods, and would be supported through the anecdotal evidence in the literature. These climbers are described as “athletically and aesthetically unworthy” and that they have “profaned and debased” the sacred peaks (Krakauer, 1997, p.23). It would appear that these climbers were not adopting the traditional ethic or point of view, nor were they respecting the homeland of those they paid to keep them alive. We find this explanation very likely, and would fit well with the data and the collected evidence.

Towards these ends we have split the death variable into the death of a Sherpa, a climber and the term where both a Climber and Sherpa die (see Table 4). Other than this we use the same time periods and variables. We find that all the variables remain consistent in both significance and sign, except the new death variables. An interesting result here is the effect of a Sherpa death within the non-commercial expeditions; the effect here is very strong and significantly negative (9-10). This would indicate that the death of a Sherpa has a significant effect on a successful outcome, indicating willingness of the expeditions to stop or at the very least has a significant effect on their ability to continue. These findings are very much in line with the emotional attachment argument, such that the death of anyone in a non-commercial group has a significantly negative effect on success. The same cannot be said of the commercial expeditions, the effect of a death has no significant effect whatsoever on that of success, demonstrating little attachment with the Sherpas (see specification 11). Given the high ratio of hirelings to clients this result is completely understandable. It would appear that an individual Sherpa is replaceable, providing further evidence of the low attachment and emotional bond between commercial climbers and those they work with or hire. In line with previous results a death of a climber is significant and negative for the non-commercial specifications (9 & 10), but is insignificant for the commercial expeditions (11). This is again well supported in the anecdotal literature on modern climbing. In the initial periods we have a homogenous group (traditional climbers), where acceptance of the social norms and values is close to universal. Under these conditions it would be relatively easy to demonstrate how repeated interaction with social sanction or punishment would make this model work. However, we should also observe a similar result without social sanction for a homogenous group and even with a purely self-interested set of climbers we should observe cooperation and helping behaviors. Self-interest would dictate that in such an extreme environment, helping other by rendering aid can be viewed as a self-interested act by rendering aid today, tomorrow when I need aid it will be extended to me (insurance principle). Of course this principle falls down if those with whom I am interacting with will not be around tomorrow to reciprocate. However, in specification (9) we observe little change in the significance of either a climber or Sherpa death from specification (10). This lack of change could indicate no crowding out effect or is evidence that it is the Sherpas themselves that are the maintainers of the prosocial behavior within the traditional non-commercial group.

Emotional attachment and closeness between individuals is a by directional relationship. It is not only there for the support of others individuals if they have an accident, but also provides support for yourself if you have an accident. The extreme cost of this relationship can be seen in the actions and reactions after the death of an individual (Sherpa or climber). There are several very strong emotional and moral costs imposed on the remain-

der of the group or those providing aid: firstly, the decision of whether or not to continue climbing; and secondly, the costs associated with the disposal of the corpse (i.e. funerals, burials, cremations, religious services etc.). Both of these are strongly intertwined and are dependent on beliefs of the individual and the group⁵⁰. It may also be the case that groups without Sherpas might already be close knit groups. In the case where individuals already know each other well and have substantial mountaineering skills, they may not require a Sherpa. Thus, in Table 3 when we observe a decrease in significance and size, this may indicate a crowding out effect amongst mountaineers but the presence of Sherpas can help to enforce pro-social norms within the group. This is further supported by the marginal effects in Table 4 between the variables Death Sherpa and Death Climber which are relatively similar and high, but for Death Sherpa the effect is even a little bit higher. This is also interesting taking into account that the Sherpas are hired help and are not seen as part of the expedition proper⁵¹.

On the one hand the family of the deceased may wish to have the body returned to them for a “proper” burial or service – this imposes a very large imposition on the remainder of the expedition. Not only do they need to get the body down but they will most likely need (want) to attend. What is the moral obligation at this point? Usually burials occur shortly after death because of decomposition issues, but a frozen body will not suffer from this problem so this removes a possible time constraint. However, if a religious service needs to occur within a set period of time after death, this can create a large moral obligation on the others. Alternatively, career climbers may believe that it is better to be buried on the mountain (forever close to the sport they love) and for their friends to continue on as they would have wanted to. It is not uncommon for bodies to be “buried” on the mountain (i.e. wrapped in a sleeping bag, cloth or tent and either rolled into a crevasse or covered with rock). This can be the default behavior if it is too difficult or dangerous to remove the body, which is usually the case at higher altitudes. Furthermore, this may be the expected response if members of the expedition believe it was the deceased wishes to be buried on the mountain. When asked about the number of dead bodies still upon Everest, Alan Arnette stated: “The best number I have is that approximately 233 people have died and of those, my wild guess is that 200 bodies are still there” (Quinlan, 2012). A mountain burial removes the need to drag the body down the mountain and to some degree lowers the moral costs if the party chooses to continue climbing. On the other hand, this becomes a moot point if there is no emotional attachment of moral obligation placed on the climbers after the death of an expedition member.

Climbers who have no relationship with each other and none with their Sherpas are unlikely to expend large amounts of their own energy to drag someone down without a strong motivation. It may be that they could be shamed into helping if others are in the vicinity and are offering to help, but if they are able to justify it to themselves it is likely they would not volunteer. Superficially, the actions of a traditional mountain burial and

⁵⁰It is very difficult to disentangle moral, religious and practical concerns when it comes to the treatment of the dead. Depending on beliefs, circumstances and viewpoint just about any situations could be argued as morally ambiguous.

⁵¹When Sherpas and porters are hired they are generally done on a no refund basis by the agency, such that if the expedition is cancelled they are paid regardless of the expedition outcome. This means that the pro-social behavior of the Sherpas may not be financially motivated, but instead by some innate cultural altruism or other-regarding preferences.

those of the unattached climbers look very similar, as both climbers are free to continue onwards towards their goals. Both result in the expedition continuing on their climb, but the motivation for each is vastly different. Furthermore, the aim of the climbers may be changed by the death of another person. If you have a close attachment to the deceased you may no longer be interested in climbing. For a traditional climber this may not be an issue, as you are likely to return for another attempt. However, a commercial climber who has paid a large sum of money for that single attempt (with no refunds for failure), there is not only the likelihood of a lower level of attachment but as their ultimate goal is to summit and not return the motivation to continue is greater.

However, at times the conditions and situation is just not conducive to bring down someone who has died, especially in the high altitude “death zone.” In 1998 American climber Francys Distefano-Arsentiev was found dying at 8,500m after summiting late in the day (see Hawley & Salisbury, 2007, EVER98107). Initially she was found by an Uzbek expedition, the decision to provide aid (oxygen) this close to the summit split the team. Two of the Uzbek expedition, Fedorov and Grigotiev, stayed with her while the remainder of them continued to the top. Additional assistance was given by passing South African Expedition members (O’Dowd, Woodall and Zangbu). They tried to help for over an hour by giving her water, putting her arms back into her sleeves and gloves on her hands. Eventually Woodall and O’Dowd could do no more and returned down camp. Francys was later found dead by the descending teams. Even though their meeting was brief, Woodall had built an emotional attachment with Francys and was deeply affected by being forced to leave her behind. In 2007, he returned to give her a true mountain burial. He wrapped her in an American flag, lay her to rest within sight of the summit she had earlier conquered and covered her with a cairn of stones to shield her body from view (Harris, 2007). Although weakened, it appears that the norms of the “tweedy gentlemen” still live on.

Conclusions

This paper has demonstrated that over last 60 years competing social institutions have shifted behavioral norms, specifically on the effect that death has on expedition success. The narrative analysis approach (see, e.g., Bates et al., 1998; Greif, 1998; Greif & Laitin, 2004) is used here to work around some of the shortcomings that occur when attempting to analyze historical data as neither a purely narrative nor an empirical approach would have been sufficient alone. One of the problems in the analysis of historical events and natural experiments is inability to directly witness the event and the reliance on outcomes rather than observation. The result of this is that we can only create estimates based upon the outcomes of events not the events themselves. This impacts the analysis in several ways; firstly, the event has already occurred before the investigation begins which means that only the data that currently exists can be used. Additional questions or information can be very difficult to obtain and when it can be recorded it may be ex post biased. The analytic narrative approach has allowed us to piece together the story where data limitations and holes are numerous to explore both formal and explicit questions (Bates et al., 1998, p.10). As such we are better able to understand the attitudes, beliefs and preferences of the individuals, as well as the potential constraints on actions (Bates et al., 1998, p.11). While the analysis is not specifically theory driven, it does provide insights about the behavior and outcomes from a particular situation with specific characteristics.

To make such work more general further studies would need to be carried out in a more controlled way controlling for many of the variables not obtainable in the initial analysis⁵². A recent field study carried out by Savage and Torgler (2013a) in Namche Bazar on the trail to Mt. Everest, elicited the attitudes and beliefs of climbers and trekkers on their way to base camp and above. The initial analysis of this study has shown that there appears to be a difference in the self identification between commercial and non-commercial climbers. We observed this clearly in individuals who identified themselves as being part of a commercial expedition and then selected the climbing types they most identified with. The commercial climbers weakly self-identified with “traditional climber”, “mountaineer” or “alpinist” (see Figure 2a). However, they identified very strongly with the more modern, non-traditionalist view of climbing “adventure seeker”, “adrenaline junkie” and “someone who looks for challenges” (see Figure 2b)⁵³.

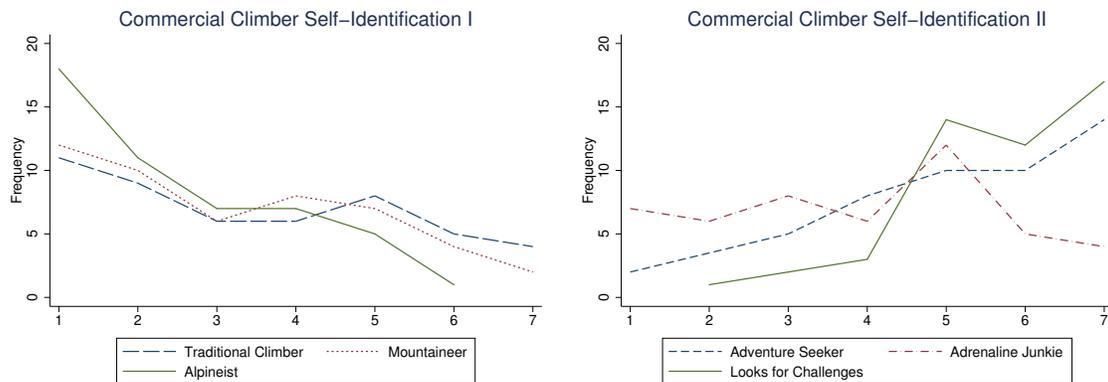


Figure 2. a) Traditionalist views

b) Non-Traditionalist views

To date there has been very little evidence demonstrating shifts in social norms, emotions or group identity over time in extreme, or life and death situations. While this and our previous works have shown that pro-social behavior and altruism do play a role in extreme life and death events (Frey et al., 2010a, 2010b) and that supportive pro-social emotions are the first and strongest to emerge during these events (see, Savage & Torgler, 2013b, in press.), much more work is needed to understand how social norms and institutions affect individual behavior in these extreme situations and environments. We observe some truth to Hillary’s notion that during his day the traditional climbers strongly adhered to such pro-social behaviors as such death had a significant effect on success. When members of these expeditions die the expedition was significantly less successful. This may be driven by the members halting and bringing the dead and strongly injured back down.

⁵²It would be nice to be able to identify an initial baseline level of risk seeking/aversion and altruism within the climbers and then compare these to the observable behaviors and actions. Additionally, in line with Akerlof and Kranton (2000) it would be helpful to be able understand how strongly the climbers identify with either the commercial or traditional norms or values. It may also be interesting to understand how individuals in each of the social institutions perceive their probability of dying and that of success. Furthermore, it would be very helpful to get an insight and understanding of the Sherpa people’s attitudes towards climbing, given that the mountains are sacred to them and they work (climb/guide/porter) on these peaks for a living.

⁵³For both figures a 7 point Likert scale is used ranging from 1 = NOT AT ALL to 7 = A LOT.

This supports the idea that a single social institution supports and reaffirms cooperative and pro-social behavior in this environment. Additionally, it shows that emotional attachment and closeness to each other and the Sherpas are in part responsible for the results.

While we have focused on the notion that some climbers will turn around and walk away from their expedition to help others, we have not looked at the ability of some of these helping individuals to then turn around and return back up the mountain⁵⁴. One of the main problems associated with descending and re-ascending is the physically detrimental effects of high altitude on the human body. The three main health issues caused by high altitude are AMS, HAPE and HACE. All of these conditions are caused not by a lack of oxygen but from the lack of atmospheric pressure (US Army Research Institute of Environmental Medicine, 1994, p.4). This lack of pressure affects not only the ability of the lungs to absorb oxygen from the air but at the cellular level it creates difficulty for hemoglobin to effectively transport and deliver oxygen to muscles, making all activity difficult⁵⁵. The recommended treatment for individuals suffering from high AMS, HAPE or HACE is to be taken down to a lower altitude for recovery. The mental effects, such as confusion and clarity of thought quickly clear with the increased oxygen delivery to the brain. However, it may take several weeks for the physical symptoms to clear. The danger of re-ascending after assisting another climber down to safety is that the physical damage of being in the high altitude climate has not yet had a chance to recover. Making it much more likely that those climbers could suffer from a serious altitude related condition. It is this issue that made the efforts of Anatoli Boukreev's re-ascent in 1996 after making it back to camp astonishing. After making the summit of Everest without oxygen, he descending back to camp, grabbed some oxygen cylinders and re-ascended to find stranded climbers who would have surely perished without his assistance.

The past few decades has seen the introduction of a second (competing) social institution and the anecdotal evidence suggested that this has eroded helping and pro-social behaviors. This belief is indirectly supported in the analysis, with the uptake of commercialization reflecting the significant drop in deaths affecting the success of expeditions. It may be that the inability to punish social norm transgressions has over time weakened pro-social behaviors as predicted by Heckathorn (1989). But it is not only the commercial climbers that are less likely to engage in helping behaviors, but their introduction appears to have weakened the altruistic behaviors of the traditional climbers as well. This result demonstrates that a competing social institutions can crowd-out existing good behaviors and support the rise of less noble anti-social ones by being a catalyst for the weakening of the traditional institutional values. It seems that the introduction of the competing social norm has degraded the prosocial behavior of climber and only through the cultural attitudes of the Sherpa people is the prosocial attitude being maintained in the traditional

⁵⁴A further difficulty in turning aside from ones expedition is the limited window available for climbers to attempt Mt. Everest. There are only two season in which the vast majority of climbing occurs, Spring and Autumn. This is due to the bitter cold storms that occur during winter (whiteouts, blizzards etc.) and during the summer (the monsoon season) high winds and storms are common. Realistically this results in the prime climbing window falling in the middle of each of these two seasons, spanning about 6 weeks. If abandoned to provide aid, the time frame for climbing makes it almost inevitable that the season is effectively over.

⁵⁵For an overview of high altitude medicine see US Army Handbook on Medical problems in High environments (US Army Research Institute of Environmental Medicine, 1994).

climbing group⁵⁶. Without the ability to enforce the norms of the traditional climbers onto the commercial ones, the brotherhood of the rope could fully disappear being replaced by climbers unwilling to stop and turn around for those in need. This poses a disturbing question. Is this a reflection of modern society in an extreme life and death arena being played out at 8,000 meters or are we merely observing the attitudes and behaviors of a sub-set of society that is not transferable to the general population? To slightly paraphrase Thaler (2000), more work is needed if we indeed wish to better model and understand the most behaviorally complex creature on earth, Homo Sapiens.

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⁵⁶To truly disentangle to attitudes of climbers from the Sherpas, further studies need to be carried out focusing on the Sherpa people.

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