Essay

Social-Psychological Principles of Community-Based Conservation and Conservancy Motivation: Attaining Goals within an Autonomy-Supportive Environment

DANIEL DECARO* AND MICHAEL STOKES†

*Department of Psychology, Miami University, Psychology Building No. 247, Oxford, OH 45056, U.S.A., email decaroda@muohio.edu

†Department of Biology, Western Kentucky University, 1906 College Heights Boulevard, Bowling Green, KY 42101-1080, U.S.A.

Abstract: *Community-based natural resource conservation programs in developing nations face many implementation challenges underpinned by social-psychological mechanisms. One challenge is garnering local support in an economically and socially sustainable fashion despite economic hardship and historical alienation from local resources. Unfortunately, conservationists' limited understanding of the social-psychological mechanisms underlying participatory conservation impedes the search for appropriate solutions. We address this issue by revealing key underlying social-psychological mechanisms of participatory conservation. Different administrative designs create social atmospheres that differentially affect endorsement of conservation goals. Certain forms of endorsement may be less effective motivators and less economically and socially sustainable than others. From a literature review we found that conservation initiatives endorsed primarily for nonautonomous instrumental reasons, such as to avoid economic fines or to secure economic rewards, are less motivating than those endorsed for autonomous reasons, such as for the opportunity for personal expression and growth. We suggest that successful participatory programs promote autonomous endorsement of conservation through an administrative framework of autonomy support—free and open democratic participation in management, substantive recognition and inclusion of local stakeholder identity, and respectful, noncoercive social interaction. This framework of the autonomy-supportive environment (self-determination theory) has important implications for future research into program design and incentive-based conservation and identifies a testable social-psychological theory of conservancy motivation.*

Keywords: community-based conservation, community participation, conservancy motivation, incentive structure, policy processes, sustainable development

Principios Psicológicos Sociales de la Conservación Basada en Comunidades y la Motivación por la Conservación: Alcanzando Metas en un Ambiente de Autonomía y Solidaridad

Resumen: *Los programas de conservación de los recursos naturales basados en comunidades en países en desarrollo enfrentan muchos retos de implementación avalados por mecanismos socio-psicológicos. Un reto es recabar apoyo local de manera económica y socialmente sustentable no obstante adversidades económicas y desinterés histórico por los recursos locales. Desafortunadamente, el conocimiento limitado de los conservacionistas acerca de los mecanismos socio-psicológicos que subyacen en la conservación participativa impide la búsqueda de soluciones apropiadas. Abordamos este tema revelando los mecanismos sociales y psicológicos subyacentes en la conservación participativa. Diferentes diseños administrativos crean atmósferas sociales que afectan diferencialmente el respaldo de las metas de conservación. Ciertas formas de respaldo pueden ser motivadores menos efectivos y menos sustentables económica y socialmente que otros. En una revisión de literatura encontramos que las iniciativas de conservación suscritas por razones instrumentales no autónomas,*

Paper submitted June 13, 2007; revised manuscript accepted March 7, 2008.

Conservation Biology, Volume 22, No. 6, 1443–1451

DOI: 10.1111/j.1523-1739.2008.00996.x

tal como evitar multas económicas o asegurar recompensas económicas, son menos motivadoras que las que se suscriben por razones autónomas, como la oportunidad para expresiones y crecimiento personal. Sugerimos que los programas participativos exitosos promueven un respaldo autónomo de la conservación por medio de un marco administrativo de apoyo autónomo—participación democrática libre y abierta en el manejo, reconocimiento sustantivo e inclusión de identidades locales, e interacción social respetuosa y no coercitiva. Este marco para el ambiente de autonomía y solidaridad (teoría de la autodeterminación) tiene implicaciones importantes para el diseño de investigaciones futuras en diseño de programas y conservación basada en incentivos e identifica una teoría socio-psicológica comprobable de motivación para la conservación.

Palabras Clave: conservación basada en comunidades, desarrollo sustentable, estructura de incentivos, motivación para la conservación, participación comunitaria, procesos políticos

Introduction

The conservation literature provides many examples of positive outcomes from participatory approaches to sustainable natural resource conservation in developing nations (e.g., Lewis et al. 1990; Hartshorn 1995; Infield 2001; Zhang & Wang 2003). Nevertheless, participatory conservation programs do not always achieve their focal objective of resource conservation via local stakeholder empowerment (Berkes 2003). Recent reviews have identified several factors as contributing to the mixed successes of community-based conservation (CBC) programs, including conflict between CBC's fundamental objectives to promote both natural resource conservation and local development, competing local and conservation interests, unreliable and/or unsustainable (economically or socially unwise) incentive systems, and failures to implement genuine local participation (Hackel 1999; Songorwa 1999; Newmark & Hough 2000). Unfortunately, conservationists' lack of awareness of the fundamental social-psychological mechanisms that affect the success or failure of CBC programs impedes the resolution of weaknesses in participatory programs (Bryant 1991; Jacobson & McDuff 1998; Brockington et al. 2006). Just as underlying chemical and physical principles must be understood to explain interactions within an ecosystem, the psychological bases of individual behavior must be understood to predict the behavior of communities. Nevertheless, this approach is nearly absent in the conservation literature (but see Manfredo & Dayer 2004). Thus, psychological research could greatly inform natural resource conservation and contribute to the solution of its most challenging social-psychological dilemmas (Saberwal & Kothari 1996; Jacobson & McDuff 1998).

Two areas of uncertainty in the social-psychological mechanisms of participatory conservation have been posed as the bases of CBC's greatest challenges. The operative psychosocial mechanisms of CBC are ambiguous—CBC programs are frequently implemented without a clear understanding of what constitutes optimal local participation or how participation exerts its positive influence, if any, on human performance (Songorwa 1999). Little is known about local stakeholders' perceptions of participatory programs or how participants will ultimately respond to programs' incentive structures and suggested ways of life (Okafor 1987; Jacobson & McDuff 1998).

These uncertainties in the underlying mechanisms of CBC translate into three unaddressed questions that must be solved for participatory approaches to be realistic alternatives to centralized, nonparticipatory approaches to sustainable natural resource conservation. The first is broadly concerned with program acceptability and impact: How can conservationists garner public acceptance of initiatives, foster productive coexistence among locals and natural resources, prevent the marginalization of indigenous stakeholders, and understand the social and economic impact of their interventions (Brockington et al. 2006; Stankey & Shindler 2006)? Second, what types of sustainable incentives available to CBC promote enduring conservation practices among people confronted by economic hardship and food insecurity (Barrett & Arcese 1995; Hackel 1999)? Third, will participatory projects backfire against conservation as local people embrace autonomous self-representation (Infield 2001; Brockington et al. 2006)?

We believe that if questions about human autonomy, motivation, and individual and group dynamics are central to CBC's challenges, a social-psychological perspective that identifies the motivations that underlie participatory conservation must form the heart of any definitive solution to these problems. Thus, we address some concerns and misconceptions regarding CBC by describing the social psychology relevant to present practices in natural resource conservation. We identify self-determination theory's (SDT) theory of motivation (Deci & Ryan 1985, 2004) and its concept of the autonomy-supportive environment (Deci et al. 1994) as a framework for defining the psychosocial mechanisms of successful CBC programs. We also provide recommendations for implementing principles of SDT and social psychology in future conservation initiatives. This framework

within which conservation goals are achieved by supporting the autonomy of local stakeholders provides a social-psychological theory for conservancy motivation and therefore has implications for program design and incentive-based natural resource conservation.

Importance of Stakeholder Autonomy in Sustainable Conservancy Motivation

Community-based conservation programs promote natural resource conservation by acknowledging local stakeholders' autonomy (Western & Wright 1994). This is accomplished by transferring the power of authority to local stakeholders through democratic procedures, such as inclusion in management decisions, legitimized access to natural resources, and local development with revenues derived from sustainable use of natural resources, practices generally termed participatory democracy (Watkin 2003). Although stakeholder empowerment is widely regarded as an essential component of successful CBC (Western & Wright 1994; Colchester 2000; Watkin 2003), its mechanisms are poorly understood in the conservation literature (Jacobson & McDuff 1998; Berkes 2003; Brockington et al. 2006). Inadequate knowledge of the effects of autonomous participation on long-term commitment to conservation has led some to question its role in sustainable conservation (e.g., Hackel 1999). One concern is that participatory approaches lack the requisite incentive strength to maintain longstanding conservancy motivation vis-à-vis realistic economic hardships (Barrett & Arcese 1995; Hackel 1999; Infield 2001). Fortunately, the mechanisms and benefits of personal autonomy as a source of motivation beyond economic incentive are well documented in the social psychology literature on control motivation and self-determination theory (Deci & Ryan 1985, 2000, 2004). This literature helps clarify misconceptions about motivating conservancy through the facilitation of personal autonomy.

The perception that one is autonomous is grounded in the ability to attribute the causes of events in one's life to internal causes, such as one's own actions, skills, and preferences, rather than to external causes such as fate (Ryan & Connell 1989). One must also believe that one's behaviors are freely self-endorsed, lacking excessive external prodding or coercion (Deci & Ryan 1985). Self-determination theory distinguishes among 3 types of motivation for a particular activity on the basis of individuals' levels of perceived autonomy (Deci & Ryan 1985, 2004). These motivational types are expressed in terms of individuals' reasons for doing the activity and the degree to which these reasons align with self-held values (Sheldon & Elliot 1999).

Amotivated individuals lack clear reasons for their behavior and do not experience a feeling of autonomy or congruity with their self-held values when confronting the activity (Deci & Ryan 2004). Amotivated individuals are complacent or apathetic toward environmental issues and make little progress toward conservation goals (Pelletier et al. 1998). This may be the case in situations where individuals feel disenfranchised from the conservation decision-making process, as was the case in apartheid-era South Africa and in the formation of the early U.S. park system (Nash 1982; Pollard et al. 2003).

Heteronomous motivation is a relatively nonautonomous motivational state in which reasons for engaging in an activity primarily concern influences outside one's core values. Heteronomously motivated individuals must experience a feeling of pressure, coercion, or enticement to act (Deci & Ryan 2004). Thus, these individuals conserve as a result of instrumental concerns—to obtain an economic or social reward, such as financial remuneration or social recognition, respectively (Pelletier et al. 1998; De Young 2000). The "fences and fines" approach to conservation represents the more extreme, and demonstrably less effective, example of heteronomous motivation within the conservation literature (Barrett & Arcese 1995). The contemporary practice of linking natural resource conservation to revenue for local development projects to motivate local stakeholders to participate in conservation initiatives exemplifies the less extreme form of heteronomously motivating programs (e.g., Lewis et al. 1990; Watkin 2003). A common example of such motivation is community-based ecotourism, in which local communities may rather not deal with tourists but given the presence of a tourist draw such as a park, develop tourist-based activities and become reliant on the income generated by them (e.g., Hulme & Infield 2001). Dwyer et al. (1993) found that heteronomous motivation alone is ill suited for sustainable conservation. These programs typically generate a relatively minimal response that ceases when the conservation intervention ceases (De Young 2000; Thibault & Blaney 2001) or backfires (Mazis 1975). Such interventions are costly to maintain because they alone do not promote intrinsic value—or internal motivation—for conservancy and therefore require constant administrative vigilance and incentive to remain effective (Osbaldiston & Sheldon 2003).

In contrast, conservation interventions via autonomous motivation typically produce robust positive responses that persist long after a program's cessation and are relatively inexpensive to set up and maintain (e.g., Dwyer et al. 1993; De Young 2000; Thibault & Blaney 2001). Autonomous motivation arises when the person feels free to choose goals and methods. Considerable incentive strength comes from the capacity to exercise self-held values and from the feeling that one's internal desires determine one's destiny. These individuals are more likely to see the activity as an essential part of their self-identity. They seek to involve the activity in other parts of their life, viewing it as desirable for its

own sake (in conservation terminology, the activity has "intrinsic" value) (Deci & Ryan 2004). Individuals who form concrete plans specifying when, where, and how they will pursue a conservation goal are more likely to attain the goal (Bamberg 2002; Holland et al. 2005). Autonomously motivated individuals are more likely than amotivated or heteronomously motivated individuals to spontaneously generate such plans (Brickell & Chatzisarantis 2006) and are more likely to commit to such plans if assigned by someone else in a way that does not undermine personal autonomy (Koestner et al. 2006). If the person identifies with conservation ideals, then there is a self-sustaining motivation to conserve (Pelletier et al. 1998; De Young 2000). For example, in the Gambia Protected Areas Complex conservation project (Thibault & Blaney 2001), government agents, NGOs, and volunteering local stakeholders were initially trained in ecological survey techniques. Two years later and after financial reimbursement had ceased, approximately 76.2% of trained local stakeholders—individuals who held personal, local interest in natural resource conservation—continued to do conservation work involving the technique in which they were previously trained. This contrasted sharply with the 7.7% retention rate observed for government agents and 0% rate for NGOs, whose primary sources of motivation, wages and institutional recognition, were decidedly heteronomous.

Autonomous motivation coupled with task self-identification provides additional cognitive and social benefits (Deci et al. 1999) that we believe contribute to sustained conservation. When individuals pursue goals autonomously, they experience improvements in emotional, physical, and psychological well-being (Sheldon & Elliot 1999) and conceptual learning and performance (Vansteenkiste et al. 2004). These individuals also exhibit improved trust and decreased aggression toward autonomy-granting institutions (Gagné & Deci 2005). Insofar as natural resource conservation in developing nations requires adaptive management grounded in optimal learning, problem solving, and human interaction, each of these effects may contribute to the success of autonomy-granting conservation programs.

Nevertheless, it is unrealistic to expect that every local stakeholder will spontaneously self-identify with conservation ideals and pursue conservation goals unguided (Songorwa 1999; Stankey & Shindler 2006). This is especially true in developing nations, where a history of colonialism and the fences-and-fines approach to conservation has alienated stakeholders from local resources and has undermined intrinsic interest in conservation (World Conservation Union 1980; Gibson & Marks 1995). A legitimate concern is that stakeholder democratic participation initiated by CBC will generate backlashes against conservation goals as stakeholders exercise newfound freedoms (Hackel 1999; Infield 2001). Although this outcome probably cannot be absolutely eliminated, we believe current successful CBC programs succeed precisely because they lessen this possibility by simultaneously promoting autonomous motivation and stakeholder identification with natural resources through an administrative framework called the autonomy-supportive environment (ASE; Deci et al. 1994; Deci & Ryan 2004). We believe parallels between the ASE and CBC provide a formal social-psychological definition of what a successful participatory conservation program entails and establishes the bounds between sustainable and unsustainable incentive systems.

The ASE as the Operative Mechanism of Successful CBC

Insofar as the success of CBC depends on local stakeholders valuing conservation and being autonomously motivated, promoting these must be an important goal for CBC. We believe successful CBC programs accomplish this via an administrative framework with three social-psychological components—provision of personal choice, substantive recognition of stakeholder identity (beliefs, values, preferences, concerns), and noncoercive social interaction (Ryan et al. 1983; Deci et al. 1994). Self-determination theory calls this framework the autonomy-supportive environment and has demonstrated that it promotes the autonomous self-endorsement of new beliefs, values, and goals and generates robust autonomous motivation (Deci et al. 1999; Deci & Ryan 2000).

We believe the successes of CBC can be contrasted with the comparatively less successful (World Conservation Union 1980; Gibson & Marks 1995) nonparticipatory approaches exemplified in extreme form by the elite protectionist policies of colonialism previously witnessed in African resource management or by the concept of "fortress" or fences-and-fines conservation (Adams & Hulme 2001). These programs characteristically do not implement the social-psychological components of the autonomy-supportive environment and can therefore be considered controlling environments from an SDT perspective. Controlling environments undermine both autonomous motivation and intrinsic self-identification for new beliefs, values, and goals.

The fundamental difference between an autonomy-supportive and a controlling environment is that autonomy-supportive environments change people's attitudes and goals by providing ample opportunity for individuals to align them with preexisting self-held goals and attitudes, much as successful missionaries incorporated native religious ideas into the introduced dogma. Controlling environments seek a more direct path of coercion or enticement, generating either no self-identification with the goal-relevant behavior (amotivation) or instrumental identification (heteronomous) in which the behavior is

valued primarily for social or economic return (Deci & Ryan 2004). These fundamental differences are apparent in the natural resource conservation literature in developing nations and are instructive as guidelines for sustainable conservation.

Provision of Choice

According to SDT, freedom of choice is a universal human need (Deci & Ryan 2000), meaning that the desire for autonomous self-control influences all human cognition (Baumeister & Leary 1995), including perceptions of social justice and institutional acceptability (Caripini et al. 2004; Frey et al. 2004). Expressing oneself by choosing what to do and how to do it is an essential provision of autonomy (Deci & Ryan 2004).

Successful CBC programs facilitate local stakeholder choice through genuine open democratic participation in management (O'Riordan & Stoll-Kleeman 2002; Barr 2003; Dalton 2005). Successful CBC includes local stakeholders in all levels of administration, giving the general community direct administrative access through appointed members and indirect access through discourse with those members for the purposes of program inquiry, complaint filing, and other forms of constructive participation (Watkin 2003). These provisions allow stakeholders to solve conservation problems in ways that align conservation objectives with their individual and cultural goals and values. Open democratic participation may also play an important role in facilitating coordination of the many interested parties—international donors, national and local government, conservationists and stakeholders—and multiple objectives involved in CBC (Berkes 2007). For a group historically disenfranchised from basic participatory rights and autonomy (Gibson & Marks 1995), this provision associates CBC programs with unprecedented opportunities for democratic freedom, placing conservation in a positive light and increasing its intrinsic value (Deci et al. 1994; Osbaldiston & Sheldon 2003). Providing choice signals respect and competence, which further promotes long-term goal commitment and attainment (Ryan et al. 1983). This enhances program acceptability (Caripini et al. 2004; Frey et al. 2004). Programs that do not provide genuine binding, democratic, open participation will be evaluated less positively by stakeholders (Gillingham & Lee 1999; O'Riordan & Stoll-Kleeman 2002; Dalton 2005). To establish genuine binding, democratic participation, programs must guard against autocratic power struggles within the community, as an autocratic chief or particularly self-focused local stakeholder can stifle others' autonomous participation (Dalal-Clayton & Child 2002).

Community-based conservation projects also frequently incorporate sustainable local development (Watkin 2003). Linking natural resource conservation to community-based development projects is another way CBC facilitates stakeholder choice. Reinstating stakeholders' rights to economic return from local natural resources psychologically empowers stakeholders' autonomy through formal acknowledgment of their autonomy (Western & Wright 1994; Barr 2003; Caripini et al. 2004). Fundamental dietary and medical health needs must be addressed before stakeholders can prioritize conservation goals (Cantor 1994; Watkin 2003). Hence, CBC programs often facilitate stakeholder choice by dedicating funds gathered through conservation initiatives to local development and education in an attempt to address fundamental needs (e.g., Lewis et al. 1990). For example, Western Kentucky University and the University of Nairobi provide marketing assistance for people selling local products, such as baskets, produced in a sustainable fashion by artisans in villages near the research station in Kenya. Profits are used by local basket cooperatives to pay secondary school fees for impoverished students. The universities also provide medical expertise and supplies to the local communities, but not in a quid pro quo arrangement for conservation, which would be a form of heteronomous motivation. General education and targeted conservation-relevant training also broadens stakeholders' understanding of conservation, thereby increasing stakeholders' capacities to envision additional means of contributing to conservation autonomously (Lewis 1995).

Research by Lewis (1995) with the ADMADE project in Zambia illustrates how the general participatory principle of democratic participation translates into smaller-scale participation that enhances commitment to conservation goals. Lewis incorporated community volunteers in a training program to help regional communities develop maps of local resources for use in program planning and resource conflict resolution. The incorporation of local villagers served an additional social advocacy function. Village scouts' regular interaction with peers in the community indirectly improved program acceptability through mechanisms described by McKenzie-Mohr (2000). One obstacle to program acceptability is cultural acceptability (Stankey & Shindler 2006). Research on the social contagion of goals indicates that individuals are more likely to spontaneously adopt others' goals if modeled by a close other, such as a family member (Shah 2003). Thus, community involvement is increased through the passive observation of local role models, such as village scouts, whose participation demonstrates through localized social norms that participation in CBC is an acceptable and rewarding lifestyle (Cialdini et al. 1990; McKenzie-Mohr 2000). This is one means of bolstering commitment to CBC initiatives that may be beneficial to emphasize in future projects. For example, asking stakeholders who have already made conservation commitments to display an icon, such as a sign, on or near

their residence to indicate their association with conservation programs may facilitate cultural acceptance of CBC (McKenzie-Mohr 2000).

Simply asking stakeholders to make a pledge to either a presented or self-chosen conservation goal is another effective and economically efficient means of motivating conservancy while facilitating choice (Dwyer et al. 1993; Osbaldiston & Sheldon 2003) and is becoming increasingly accepted in science (e.g., pledges of the Pugwash Society and Union of Concerned Scientists). Asking for voluntary commitment, as opposed to requiring or winning commitment solely through tangible incentives, supports autonomous motivation by encouraging individuals to formulate their own personally meaningful reasons for participating (Koestner et al. 2006). Compared with individuals who are offered economic and other tangible rewards, individuals asked if they would make a commitment to achieve a specified level of conservancy over a period of time typically conserve more during that period and for longer afterward (Dwyer et al. 1993). Hence, a noncoercive request to commit oneself to a 30% reduction in illegal snaring and consumption of bushmeat over a 2-week period may generate more long-term success than if motivated by economic incentives.

Substantive Recognition of Stakeholder Identity

Conservation programs in developing nations increasingly emphasize the importance of local stakeholders' unique perspective, traditional knowledge, and personal and cultural identities in sustainable natural resource management (e.g., Berkes et al. 2000; Infield 2001; Weladji et al. 2003; Zhang & Wang 2003). These programs have focused primarily on the information-gathering function of this provision. For example, Western Kentucky University and the University of Nairobi are using community surveys to assess how their field station affects the attitudes of local villagers regarding wildlife conservation, including bushmeat use and the presence of "outsiders." Accessing community knowledge aids preemptive resolution of potential obstacles to the successful introduction of conservation by helping ensure that interventions align with stakeholders' identities, norms, and concerns (Goodwin 1998; McKenzie-Mohr 2000). People volunteer for many reasons, including to exercise personal values, increase understanding, develop as a person, and have meaningful social interactions (Clary et al. 1998). An information-gathering approach informs incentive efficiency by helping ensure that the incentive systems used are appropriate for the particular social context and yield only their intended positive effects (Berkes et al. 2000; McKenzie-Mohr 2000). Empathic understanding of community knowledge facilitates conflict resolution among stakeholders and conservationists by preventing misconceptions and by optimizing the application of stakeholders' skills to solve problems and achieve conservation objectives (Berkes et al. 2000; Dalton 2005; Berkes 2007). Failure to recognize stakeholder environmental identity can threaten stakeholders' personal dignity and escalate preexisting conflicts between stakeholders and conservationists (Opotow & Brook 2003).

In short, empathic management is perceived as more democratic and autonomy-supportive (Caripini et al. 2004; Frey et al. 2004; Gagné & Deci 2005) and results in heightened autonomous motivation to conserve (Osbaldiston & Sheldon 2003). Continued and increased empathic incorporation of stakeholder identity via democratic community participation and survey methods seems essential to CBC. One natural byproduct of the approach may be a better understanding of the social and economic impact of CBC—a current point of weakness (Brockington et al. 2006; Stankey & Shindler 2006).

Noncoercive Social Interaction

The way administrators interact with local stakeholders conveys whether their agency is approachable, will support or thwart personal autonomy, or possesses ideals worth advocating (Gagné & Deci 2005). For instance, autocratic communication with strict ultimatums that express to people that they have to, must, or should participate is perceived as coercive, whereas language that emphasizes the voluntary nature of participation is autonomy-supportive (Ryan et al. 1983). Moreover, individuals who comply with administrative pressures tend to perceive activities they were compelled to do as valuable primarily for relieving external pressure. This promotes amotivation or heteronomous motivation and undermines internal incentives to conserve such as personal satisfaction or self-identification (Deci et al. 1994; Osbaldiston & Sheldon 2003). The protectionist–fortress approach to conservation that operated primarily by enforcing strict legal ultimatums likely faltered, in part, because of controlling social public relations. At the very least, such ultimatums would have blocked constructive communication between conservationists and local stakeholders because people react strongly against such direct orders (Brehm & Brehm 1981).

Providing rationale is an important element of noncoercive social interaction (Ryan et al. 1983). Social prescriptions are less coercive if accompanied by genuine rationales that justify the prescribed behavior, especially if the rationales emphasize personal growth and intrinsic satisfaction, rather than financial or social gains (Vansteenkiste et al. 2004). Rationales conveying management beliefs and intentions signal respect for stakeholders as autonomous, competent, and equal members of a project (Goodwin 1998; Dalton 2005). Such

rationales promote autonomous motivation and goal self-identification (Koestner et al. 2006). The institutional provision of participatory democracy in natural resource management can ensure that conservation-oriented social prescriptions are supported by genuine rationales (Caripini et al. 2004). For example, Lewis's (1995) inclusion of village scouts in a natural resource mapping project in Zambia gave the community access to important real-time information about regional levels of natural resource depletion and use patterns. This information subsequently encouraged stakeholders to spontaneously generate new means of conserving their resources and of resolving ongoing conflict over resource use. In this case, the informative maps served as an adequate rationale for the relevance of conserving limited resources. The commonplace use of conservation-oriented education by successful CBC programs (e.g., Okafor 1987; Hartshorn 1995; Watkin 2003) also promotes this cause because conservancy education underpins socially prescribed conservation goals with additional relevance.

In some situations, full stakeholder autonomy is impossible, such as when necessary resources are lacking or stakeholders' preferences fundamentally contradict conservation imperatives. Successful CBC programs lessen these conflicts by using information to improve stakeholders' understanding of conservation efforts, heighten choice, and facilitate compromise (e.g., Lewis 1995; Dalton 2005).

Future Directions

The autonomy-supportive environment administrative framework of SDT accounts for current patterns in CBC. Nevertheless, this conclusion must be tempered by the reality that most research on the effects of autonomy support on conservancy motivation was conducted within the context of industrial Western culture. Although SDT posits universal principles of human motivation and has demonstrated support for this claim in a variety of settings (Deci et al. 1999) and industrial countries (Chirkov et al. 2003), conservation in developing nations poses unique localized challenges future research should address directly. Thus, we introduce SDT's autonomy-supportive environment not as a ready solution to CBC's problems but as a descriptive theory to guide future research.

Existing CBC projects in developing nations should investigate the impact of autonomy and any of the three components of autonomy support they currently employ on conservancy motivation. Increased routine assessment of stakeholders' motivation, attitudes, concerns, and desires through interviews is the first likely step because expanding this element of existing CBC projects also strengthens stakeholder identity provision. Democratic participation in management apparently smoothes coordination of the multiple groups involved in successful CBC (Berkes 2007). Given participatory management's central role in providing support for autonomy, research should investigate the role autonomy support itself plays in the coordination process. Research should pilot conservation initiatives targeting specific components of autonomy support to assess various combinations of causal contributions to success. Community-based conservation may benefit from assessments of the relative influence of economic (heteronomous) and intrinsic (autonomous) incentives. Initially, economic incentives may be invaluable because they are direct, and perhaps the first, positive links stakeholders experience between conservancy and sustainable livelihood (World Conservation Union 1980). Other incentives complementary to autonomy support, such as verbal praise (Ryan et al. 1983), access to positive social interactions (Baumeister & Leary 1995; Clary et al. 1998), and competency (employability) gained through education and successful performance (Deci & Ryan 2000), should not be overlooked as alternative motivators vis-à-vis economic incentives. Research should document novel ways of honing, complementing, and expanding preexisting provisions for autonomy support.

Conclusion

Community-based conservation programs face many implementation challenges rooted in social psychology. By pinpointing the types of motivation that lead to long-term, self-sustaining conservancy and the underlying psychosocial mechanisms of successful participatory conservation, we have attempted to address some of these challenges. Our review of the relevant psychology and conservation literature suggests that SDT's (Deci & Ryan 2004) administrative framework of autonomy support (Ryan et al. 1983) provides an accurate account of known trends in participatory conservation. Community-based conservation programs that promote autonomous conservancy motivation through the provision of stakeholder choice, substantive incorporation of individual and cultural identity, and noncoercive social interaction appear more likely to achieve sustainable natural resource conservation in developing nations than programs that lack any of these essential design elements. We are confident the autonomy-supportive environment framework can ground sustainable natural resource conservation in a testable social-psychological theory of conservancy motivation.

Literature Cited

Adams, W., and D. Hulme. 2001. Conservation & community: changing narratives, policies & practices in African conservation. Pages 9–23 in D. Hulme and M. Murphree, editors. African wildlife & livelihoods. Heinemann, Portsmouth, New Hampshire.

Bamberg, S. 2002. Effects of implementation intentions on the actual performance of new environmentally friendly behaviours—results of two field experiments. Journal of Experimental Psychology **22:**399–411.

Barr, S. 2003. Strategies for sustainability: citizens and responsible environmental behaviour. Area **35:**227–240.

Barrett, C. B., and P. Arcese. 1995. Are integrated conservation-development projects (ICDPs) sustainable? On the conservation of large mammals in Sub-Saharan Africa. World Development **23:**1073–1084.

Baumeister, R. F., and M. R. Leary. 1995. The need to belong: desire for interpersonal attachments as a fundamental motivation. Psychological Bulletin **11:**497–529.

Berkes, F. 2003. Rethinking community-based conservation. Conservation Biology **18:**621–630.

Berkes, F. 2007. Community-based conservation in a globalized world. Proceedings of the National Academy of Sciences of the United States of America **104:**15188–15193.

Berkes, F., J. Colding, and C. Folke. 2000. Rediscovery of traditional ecological knowledge as adaptive management. Ecological Applications **10:**1251–1262.

Brehm, S. S., and J. W. Brehm. 1981. Psychological reactance: a theory of freedom and control. Academic Press, New York.

Brickell, T. A., and N. L. D. Chatzisarantis. 2006. Using self-determination theory to examine the motivational correlates and predictive utility of spontaneous exercise implementation intentions. Psychology of Sport and Exercise **8:**758–770.

Brockington, D., J. Igoe, and K. Schmidt-Soltau. 2006. Conservation, human rights, and poverty reduction. Conservation Biology **20:**250–252.

Bryant, R. L. 1991. Putting politics first: the political ecology of sustainable development. Global Ecology and Biogeography Letters **1:**164–166.

Cantor, N. 1994. Life task problem solving: situational affordances and personal needs. Personality and Social Psychology Bulletin **20:**235–243.

Caripini, M. X. D., F. L. Cook, and L. R. Jacobs. 2004. Public deliberation, discursive participation, and citizen engagement. Annual Reviews of Political Science **7:**315–344.

Chirkov, V., R. Ryan, Y. Kim, and U. Kaplan. 2003. Differentiating autonomy from individualism and independence: a self-determination theory perspective on internalization of cultural orientations and well-being. Journal of Personality and Social Psychology **84:**97–110.

Cialdini, R. B., R. R. Reno, and C. A. Kallgren. 1990. A focus theory of normative conduct: recycling the concept of norms to reduce littering in public places. Journal of Personality & Social Psychology **58:**1015–1026.

Clary, E. G., M. Snyder, R. D. Ridge, J. Copeland, A. A. Stukas, J. Haugen, and P. Miene. 1998. Understanding and assessing motivations of volunteers: a functional approach. Journal of Personality & Social Psychology **74:**1516–1530.

Colchester, M. 2000. Self-determination or environmental determinism for indigenous peoples in tropical forest conservation. Conservation Biology **14:**1365–1367.

Dalal-Clayton, D. B., and B. Child. 2002. Lessons from Luangwa: the story of the Luangwa Integrated Resource Development Project, Zambia. Wildlife and development series 13. International Institute for Environment and Development, London.

Dalton, T. M. 2005. Beyond biogeography: a framework for involving the public in planning of U.S. marine protected areas. Conservation Biology **19:**1392–1401.

Deci, E. L., and R. M. Ryan. 1985. Intrinsic motivation and self-determination in human behavior. Plenum, New York.

Deci, E. L., and R. M. Ryan. 2000. The "what" and "why" of goal pursuits: human needs and the self-determination of behavior. Psychological Inquiry **11:**227–268.

Deci, E. L., and R. M. Ryan. 2004. Handbook of self-determination. University of Rochester Press, Rochester, New York.

Deci, E. L., H. Eghrari, B. C. Patrick, and D. Leone. 1994. Facilitating internalization: the self-determination theory perspective. Journal of Personality **62:**119–142.

Deci, E. L., R. Koestner, and R. M. Ryan. 1999. A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. Psychological Bulletin **125:**627–668.

De Young, R. 2000. Expanding and evaluating motives for environmentally responsible behavior. Journal of Social Issues **56:**509–526.

Dwyer, W. O., F. C. Leeming, M. K. Cobern, B. E. Porter, and J. M. Jackson. 1993. Critical review of behavioral interventions to preserve the environment: research since 1980. Environment and Behavior **25:**275–321.

Frey, B. S., M. Benz, and A. Stutzer. 2004. Introducing procedural utility not only what, but also how matters. Journal of Institutional and Theoretical Economics **160:**377–401.

Gagné, M., and E. L. Deci. 2005. Self-determination theory and work motivation. Journal of Organizational Behavior **26:**331–362.

Gibson, C. C., and S. A. Marks. 1995. Transforming rural hunters into conservationists: an assessment of community-based wildlife management programs in Africa. World Development **23:**941–957.

Gillingham, S., and P. C. Lee. 1999. The impact of wildlife-related benefits on the conservation attitudes of local people around the Selous Game Reserve, Tanzania. Environmental Conservation **26:**218–228.

Goodwin, P. 1998. 'Hired hands' or 'local voice': understandings and experience of local participation in conservation. Transactions of the Institute of British Geographers, New Series **23:**481–499.

Hackel, J. D. 1999. Community conservation and the future of Africa's wildlife. Conservation Biology **13:**726–734.

Hartshorn, G. S. 1995. Ecological basis for sustainable development in tropical forests. Annual Review of Ecology and Systematics **26:**155–175.

Heinen, J. T. 1996. Human behavior, incentives, and protected area management. Conservation Biology **10:**681–684.

Holland, R. W., H. Aarts, and D. Langendam. 2005. Breaking and creating habits on the working floor: a field-experiment on the power of implementation intentions. Journal of Experimental Social Psychology **42:**776–783.

Hulme, D., and M. Infield. 2001. Community conservation, reciprocity & park-people relationships Lake Mburo National Park, Uganda. Pages 106–130 in D. Hulme and M. Murphree, editors. African wildlife & livelihoods. Heinemann, Portsmouth, New Hampshire.

Infield, M. 2001. Cultural values: a forgotten strategy for building community support for protected areas in Africa. Conservation Biology **15:**800–802.

Jacobson, S. K., and M. D. McDuff. 1998. Training idiot savants: the lack of human dimensions in conservation biology. conservation Biology **12:**263–267.

Koestner, R., E. J. Horberg, P. Gaudreau, T. Powers, P. Di Dio, C. Bryan, R. Jochum, and N. Salter. 2006. Bolstering implementation plans for the long haul: the benefits of simultaneously boosting self-concordance or self-efficacy. Personality and Social Psychology Bulletin **32:**1547–1558.

Lewis, D., G. B. Kaweche, and A. Mwenya. 1990. Wildlife conservation outside protected areas: lessons from an experiment in Zambia. Conservation Biology **4:**171–180.

Lewis, D. M. 1995. Importance of GIS to community-based management of wildlife: lessons from Zambia. Ecological Applications **5:**861–871.

Manfredo, M., and A. Dayer. 2004. Concepts for exploring the social aspects of human-wildlife conflict in a global context. Human Dimensions of Wildlife **9:**317–328.

Mazis, M. R. 1975. Antipollution measures and psychological reactance theory: a field experiment. Journal of Personality and Social Psychology **31:**654–660.

McKenzie-Mohr, D. 2000. Promoting sustainable behavior: an introduction to community-based social marketing. Journal of Social Issues **56:**543–554.

Nash, R. 1982, Wilderness and the American mind. 3rd edition. Yale University Press, New Haven, Connecticut.

Newmark, W. D., and J. L. Hough. 2000. Conserving wildlife in Africa: integrated conservation and development projects and beyond. BioScience **50:**585–592.

Okafor, F. C. 1987. Participatory development in rural Nigeria. Canadian Journal of African Studies **21:**231–237.

Opotow, S., and A. Brook. 2003. Identity and exclusion in rangeland conflict. Pages 249–272 in S. Clayton and S. Opotow, editors. Identity and natural environment: the psychological significance of nature. MIT Press, Cambridge, Massachusetts.

O'Riordan, T., and S. Stoll-Kleemann. 2002. Deliberative democracy and participatory biodiversity. Pages 87–112 in T. O'Riordan and S. Stoll-Kleemann, editors. Biodiversity, sustainability and human communities. Cambridge University Press, Cambridge, United Kingdom.

Osbaldiston, R., and K. M. Sheldon. 2003. Promoting internalized motivation for environmentally responsible behavior: a prospective study of environmental goals. Journal of Environmental Psychology **23:**349–357.

Pelletier, L. G., K. M. Tuson, I. Green-Demers, K. Noels, and A. M. Beaton. 1998. Why are you doing things for the environment? The motivation toward the environment scale (MTES). Journal of Applied Social Psychology **28:**437–468.

Pollard, S., C. Shackleton, and J. Carruthers. 2003. Beyond the fence: people and the lowveld landscape. Pages 422–446 in J. DuToit, K. Rogers, and H. Biggs, editors. The Kruger experience. Island Press, Washington, D.C.

Ryan, R. M., and J. P. Connell. 1989. Perceived locus of causality and internalization: examining reasons for acting in two domains. Journal of Personality and Social Psychology **57:**749–61.

Ryan, R. M., V. Mims, and R. Koestner. 1983. Relation of reward contingency and interpersonal context to intrinsic motivation: a review and test using cognitive evaluation theory. Journal of Personality and Social Psychology **45:**736–750.

Saberwal, V. K., and Kothari. 1996. The human dimension in conservation biology curricula in developing countries. Conservation Biology **10:**1328–1331.

Shah, J. 2003. Automatic for the people: how representations of significant others implicitly affect goal pursuit. Journal of Personality and Social Psychology **84:**661–681.

Sheldon, K. M., and A. J. Elliot. 1999. Goal striving, need satisfaction, and longitudinal well-being: the self-concordance model. Journal of Personality and Social Psychology **76:**482–497.

Songorwa, A. N. 1999. Community-based wildlife management (CWM) in Tanzania: are the communities interested? World Development **27:**2061–2079.

Stankey, G. H., and B. Shindler. 2006. Formation of social acceptability judgments and their implications for management of rare and little-known species. Conservation Biology **20:**28–37.

Stoll-Kleemann, S., and T. O'Riordan. 2002. Enhancing biodiversity and humanity. Pages 295–310 in T. O'Riordan and S. Stoll-Kleemann, editors. Biodiversity, sustainability and human communities. Cambridge University Press, Cambridge, United Kingdom.

Thibault, M., and S. Blaney. 2001. Sustainable human resources in a protected area in Southwestern Gabon. Conservation Biology **15:**591–595.

Vansteenkiste, M., J. Simons, W. Lens, K. M. Sheldon, and E. L. Deci. 2004. Motivating learning, performance, and persistence: the synergistic effects of intrinsic goal contents and autonomy-supportive contexts. Journal of Personality & Social Psychology **87:**246–260.

Watkin, J. R. 2003. The evolution of ecotourism in East Africa: from an idea to an industry. IIED Wildlife and Development Series **15:**1–28.

Weladji R. B., R. S. Moe, and P. Vedeld. 2003. Attitudes of the wildlife resource users towards wildlife policy and the Bénoué Wildlife Conservation Area, North Cameroon. Environmental Conservation **30:**334–343.

Western, D., and R. M. Wright. 1994. The background to community-based conservation. Pages 1–12 in D. Western, R. M. Wright, and S. Strum, editors. Natural connections: perspectives in community-based conservation. Island Press, Washington, D.C.

World Conservation Union (IUCN). 1980. World conservation strategy: living resource conservation for sustainable development. IUCN, Gland, Switzerland.

Zhang, L., and N. Wang. 2003. An initial study on habitat conservation of Asian elephant (*Elaphas maximus)*, with a focus on human elephant conflict in Simao, China. Biological Conservation **122:**453–459.