

Network influences on behavioral change

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In what way do people alter their behavior? This question is central to research about the determinants of reduced fertility and protection against HIV-infection in sub-Saharan Africa. Reduced fertility and protective behavior arise from behavioral change: sub-Saharan people move from traditionally high fertility to low fertility and from unprotected sexual intercourse to the use of condoms or to sexual faithfulness. This change in behavioral patterns is based on rational decision making and can be regarded as a two-staged process. The first stage is an evaluation of alternatives of action, i.e. the costs and benefits of keeping up old behavior or of moving to a new one. The second stage is a decision about the means to turn the intention for new altered behavior into action. This stage takes a key position because people have to decide whether to use methods that are new and innovative to most of them: modern contraceptives.

Reduced fertility is the expression of a desire for limiting a family's number of children, caused by the ongoing processes of modernization, over-population, droughts, and economic instabilities that raise the costs of having children (Cohen 1998). Moreover, a decreasing influence of religious pronatalistic norms supports reduced fertility (Caldwell et al. 1992). In addition, an individual cost-benefit analysis is held by most theories to be responsible for behavioral change in the context of AIDS (UNAIDS 1999). Unprotected sexual intercourse with multiple partners is weighted against safer sex with condoms as an optimal way of protection against AIDS or sexual faithfulness as a satisficing one.

However, the desire to limit the number of children or to have a positive attitude towards protective methods against HIV-infection do not automatically lead to behavioral change. Many people in sub-Saharan Africa are in contradictory situations. In the context of fertility reduction, 'unmet needs' are a well-known phenomenon. Women wish to reduce their fertility but they do not want or are not able to use contraceptives either. This contradiction rests on a number of reasons: contraceptives are not available; there are uncertainties about the consequences of using them, especially about possible side effects; rumors circulate about disabled babies and mothers that have fallen seriously ill because they practice family planning; contraceptives violate traditional norms of fertility and therefore women cannot imagine or are not allowed to control their fertility. A similar situation can be found in the context of protective behavior to avoid HIV-infection. An increasing number of people in sub-Saharan Africa are aware of the risks of unprotected sexual intercourse and see condoms as an appropriate way of protection. However, for many of them it is impossible to utilize condoms because their use is interpreted as a sign of sexual infidelity, mistrust, and probable HIV-infection.

To analyze the determinants of behavioral change and to identify the reasons for contradictory situations, research has to consider that individualistic models of decision making are not appropriate in sub-Saharan cultures. Individual opinions, attitudes, and behavioral patterns are influenced significantly by opinions, behaviors, and normative expectations of the social environment. Regarding reduced fertility and protective behavior against HIV-infection, personal communication networks can capture these influences satisfactorily. Ideas about modern contraceptives and protection against HIV infection are conveyed by the mass media or education programs. However, mass media messages influence individuals only indirectly (Schenk 1995). They raise a topic and provide basic information about it. This information is then

usually discussed, evaluated, and altered by personal communication networks. Contraceptives and condoms are innovative technologies in sub-Saharan Africa. According to the theory of 'innovation decision process' (Rogers 1995), the individual adoption of an innovation is based substantially on interpersonal communication. Because of this innovative character, decisions about the use of contraceptives or condoms contain uncertainties. These uncertainties can be reduced in different ways: by postponing the decision in the hope that 'things will become more obvious in future', by protecting oneself against the consequences of wrong decisions, or by collecting more information on the issue in question, making experiences and evaluations to reach a decision which is based on a more solid ground (Simon 1982).

Survey results from South Nyanza district, Kenya¹, document that people actively use their social environment by collecting information, experiences, and evaluations of others in order to reduce uncertainties in decisions about family planning (Bühler 2002). Women who never used contraceptives, but wish to control their fertility in future, talk with significantly more people about fertility and family planning than women who do not wish to control their fertility. These networks become especially large for women who want to control their fertility, but face serious uncertainties because they do not use contraceptives for fear of side effects, because of religious objections or because they have husbands that reject family planning.

People seek to reduce their uncertainties by activating their communication networks. However, these networks need to have certain characteristics to be influential (Marsden and Friedkin 1993, Friedkin 1993). Network members have to be visible and important to an individual and they need to display opinions, attitudes, and behaviors that matter to the individual and thus his decision making. Within the framework of network theory, visibility and the importance of network members are based on the structural features of structural similarity and cohesiveness. Structurally similar individuals influence one another more so than others because they are in similar situations. In cohesive networks, individuals are influential because they are highly connected to one another, either directly or indirectly, by paths of short length.

The concept of cohesiveness covers two central mechanisms of network influences on behavioral change as they are discussed in demographic literature (Montgomery and Casterline 1996). These are a) social learning, i.e. influences based on information, evaluations, and experiences made and then provided by network members, and b) social norms, i.e. the behavioral expectations of network members and their ability to impose positive or negative sanctions. Social learning rests on heterogeneous and new information. Open network structures of low density and weak ties serve this purpose best (Granovetter 1973). The emergence and enforcement of norms rest on the high visibility of individual network members and the formation of coalitions against deviants. Here, dense networks of strong ties are advantageous (Coleman 1990).

Research in South Nyanza district documents the significance of both mechanisms for fertility decisions. Women's decision whether to use contraceptives or not depend on the normative expectations of their network members (Kohler et al. 2001). Network members who practice family planning and build a dense network cause women to use contraceptives also. However, dense networks are influential in the opposite direction, too. If they are composed of members that do not practice family planning, women are less likely to change their fertility-related behavior. Social learning also plays a part (Bühler and Kohler 2002a). Surprisingly, it does not rest on

¹ South Nyanza district is in the west of Kenya at the shores of lake Victoria. The results that are presented here are only a small part of the research that is done by Susan Watkins and colleagues. See <http://www.pop.upenn.edu/networks> for more information.

weak ties. A network's composition of close relatives, confidants, or friends helps women to learn about the pros and cons of contraceptive use. Naturally, these subgroups of network members tend to build dense networks, but their influence can only be explained in part by the normative power of network density.

Communication networks about AIDS have different influences on women's and men's risk perceptions and favored protective methods (Bühler and Kohler 2002b). The perception of women that unprotected sexual intercourse is a serious source of HIV-infection depends to a large extent on the fact that many network members to whom they have strong ties also perceive this risk. However, if these strong ties do not perceive any risk of infection, women regard the risk of HIV-infection as being less likely. The risk perception of men, however, depends more on the number of risk perceivers in their networks than on the strength of relationships. On the other hand, men's and women's belief that sexual faithfulness is a satisficing solution to avoid HIV-infection is based on open network structures of heterogeneous relationships, i.e. on networks that consist of weak as well as strong ties.

Research in South Nyanza district documents that the social environment of the decision-maker influences his or her individual decision making on fertility and protective behavior against HIV-infection. However, future research needs to interlink theories of network influence with theories of behavioral change more closely than it has done so far. In doing so, theories of behavioral change might become a much more powerful tool in the fight against AIDS as they currently are.

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