**12 Stigma in early stages of psychotic illness: Connections with cognitive neuroscience**

Lawrence H. Yang, Ahtoy J. Wonpat-Borja, Mark Opler, Michael T. Compton, Meredith Kelly, Valerie Purdie-Vaughns and Cheryl M. Corcoran

**Introduction**

Schizophrenia, a chronic and oftentimes severe mental illness characterized by the presence of hallucinations, delusions and potentially lifelong impairment, has been identified as the ninth leading cause of disability worldwide. Because the symptoms of psychotic disorders emerge during late adolescence and early adulthood (a crucial time of psychosocial development), such illnesses are particularly impairing in diverse educational, occupational and interpersonal domains. However, given that the onset of schizophrenia and related psychotic disorders is preceded in 80% of cases by subclinical psychotic symptoms and other prodromal features (Häfner et al., 1998), early detection promises to reduce the disease’s public health burden. The psychosis risk syndrome has been classified as subthreshold psychotic symptoms that fulfill at least one of three criteria: attenuated positive symptoms; brief intermittent psychotic symptoms; and/or functional decline in the context of genetic risk (Miller et al., 2003). Use of this classification for identification as well as in initial randomized clinical trials of pharmacological and/or cognitive-behavioral methods of individuals who are “at risk” for psychosis (McGorry et al., 2002) has introduced the goal of reducing the prevalence of psychotic disorders by delaying onset or conversion to psychosis.

Despite the major potential benefits that early identification and treatment might confer, the question of the risk of stigma and its impact on individuals who are identified as being “at risk” for psychosis and their family members arises consistently (Corcoran, First, & Cornblatt, 2010; Corcoran, Malaspina, & Hercher, 2005; McGorry, Yung, & Phillips, 2001; Yang, Wonpat-Borja, Opler, & Corcoran, 2010). While a National Institute of Mental Health-funded study has demonstrated good reliability (xs > .80 at each site) and predictive validity of the psychosis risk syndrome (approximately 35% of individuals progress to psychosis within 2.5 years of identification; Cannon et al., 2008), over 50% of identified patients may not ultimately “convert” to psychosis. The risk of stigma is further amplified among the “false positives” who do not develop a future psychotic disorder (Corcoran et al., 2005, 2010). Because stigma comprises a potential risk for this “at-risk” designation, this chapter seeks to inform this issue by drawing upon the extensive theoretical and empirical literature on stigma to better identify how
stigma might exert effects upon individuals identified as “at risk” for psychosis. First, we determine what dimensions within the multifaceted construct of stigma are most salient and categorize the possible mechanisms by which stigma might affect individuals identified as being “at risk” for psychosis. Second, because this designation will typically be made with teens and young adults whose identity is not yet stable and whose psychosocial development is rapidly evolving, we review the empirical literature describing how stigma related to mental illnesses occurs among adolescents to determine which of the stigma mechanisms identified above may manifest in the “at risk” for psychosis group. Next, we review the few studies that evaluate stigma in at-risk states and in individuals with an initial episode of psychosis, in both patients and families, with a brief review of ethnic differences. Finally, we discuss the existing cognitive neuroscience literature to identify likely brain regions involved in the experience of stigma. We conclude by recommending areas of future study for the “at-risk” designation that are suggested by this review of the conceptual and empirical literature.

Defining stigma

Rather than being restricted to a unitary definition, conceptions of stigma have ranged from formulations emphasizing internal psychological processes to more complex conceptualizations integrating evolutionary principles, institutional policies and sociopolitical forces (see Wraga, Helt, Jacobs, & Sullivan, 2007; Yang & Kleinman, 2008; Yang et al., 2007, for reviews). In this chapter, stigma is defined and mechanisms that most directly illuminate how an official psychosis risk label (i.e., a clinical diagnosis) might impact identified subjects are elaborated. In his classic conceptualization, Goffman (1963) defined stigma as “an attribute that is deeply discrediting” that diminishes the bearer “from a whole and usual person to a tainted, discounted one” (p. 3). Goffman viewed stigma as occurring when a discrepancy exists between “virtual social identity” (how a person is characterized by society) and “actual social identity” (the attributes truly possessed by a person; p. 2). Subsequent social psychological definitions described stigma as being comprised of a “mark” that—with its linked pejorative meanings—is viewed as “engulfing” how the person is perceived by society (Jones et al., 1984). A prominent group of social psychologists defined stigma as being socially constructed by defining whom is included in a stigmatized social group and whether an attribute confers a devalued social identity in a particular context (Crocker, Major, & Steele, 1998). These definitions emphasize the centrality of stereotypes and how such social processes lead to the devaluation of an individual’s identity (Seibt & Förster, 2004).

The definition of stigma has more recently been expanded from narrower conceptions of stigma as an attribution or stereotype to encompass interrelated stigma components under a broad umbrella concept (Link & Phelan, 2001). Labelling occurs when people distinguish a human difference as significant (e.g., hearing voices and talking to oneself) and assign it a label (e.g., being
“schizophrenic”). Stereotyping then takes place when a social group’s beliefs link labelled persons (e.g., “schizophrenics”) to negative characteristics (e.g., “dangerous and unpredictable”). Next, cognitive separation occurs when labelled individuals (e.g., “schizophrenics”) are perceived as so different that complete distinction of “us” (“normals”) from “them” (“deviants”) is achieved. Emotional reactions (Link, Yang, Phelan, & Collins, 2004) include the affective responses to stigma felt by both stigmatizers (e.g., fear, disgust) and the stigmatized (e.g., shame, alienation). Status loss and discrimination occur when labelled individuals experience either devaluation (e.g., having their opinions disregarded) or unfair behavioural treatment from others. Discrimination may take place through person-to-person forms (i.e., individual-level discrimination such as being shunned or avoided) or when institutional practices stigmatize groups systematically (i.e., structural discrimination such as denying insurance due to a pre-existing psychiatric condition). Lastly, Link and Phelan proposed that the stigma process depends on the use of social, economic and political power that allows these stigma components to lead to discriminatory results. From these definitions, processes are identified involving awareness of societal stereotypes (and even more importantly, its application to the self via “internalized stigma”, described below) as possible mechanisms to describe how this harmful social dynamic might affect individuals characterized as being in an “at-risk” mental state.

Models by which stigma impacts individuals

Building upon definitions of stigma, it is possible to begin identifying potential mechanisms through which stigma might affect individuals identified as being in an “at-risk” state for psychosis by briefly describing the most relevant models of how stigma exerts its negative effects on individuals (see Major, McCoy, Kaiser, & Quinton, 2003; Steele, Spencer, & Aronson, 2002, for extensive reviews). Social psychologists have conceptualized stigma as working through processes of cognitive categorization; i.e., stigma takes place when the mark links an individual via attributional processes to negative characteristics (Jones et al., 1984). Subsequent models have included the response of individuals to stigma; e.g., preserving self-esteem through cognitive coping strategies (Crocker et al., 1998) or through a combination of involuntary and voluntary coping responses (Major & O’Brien, 2005). A major contribution of these conceptualizations is that the stigmatized individual may internalize a negative stereotype, leading to harmful effects. An example of such internalization among stigmatized individuals is the concept called stereotype threat, whereby individuals are made aware of negative stereotypes about their own group (e.g., women) in relation to a specific situation (e.g., maths achievement) and the consequent threat to that individual’s self-esteem then adversely impacts the person’s performance (Steele et al., 2002). Specific brain areas (reviewed under “social perception, stereotype threat and cognitive neuroscience” below) have also been implicated with the experience of
stereotype threat (Krendl, Richeson, Kelley, & Heatherton, 2008). With regard to people labelled with a psychiatric diagnosis, internalized stigma occurs once affected individuals become aware of societal stereotypes of mental illnesses and apply these stereotypes to themselves, which may lead to harmful psychological outcomes such as low self-esteem and depression (Ritscher & Phelan, 2004).

Of particular relevance to how stigma affects people with a mental illness is a sociological model known as labelling theory. Based on the concept of symbolic interactionism (Mead, 1934), this conceptualization proposes that social responses to deviant actions (e.g., behaving in a bizarre manner due to persecutory delusions) are constantly influenced by shared cultural languages and symbols (e.g., that “crazy” person is unpredictable and should be sent to a mental asylum). Self-conceptions then develop from perceptions of others’ beliefs and responses, thus socializing an individual into role identities (e.g., being psychiatrically ill), which are linked with behavioural expectations (e.g., chronic disability). Link, Cullen, Struening, Shroult, and Dohrenwend (1989) proposed a modified labelling theory that all members of a society internalize ideas of what it means to be labelled with psychiatric illness as part of everyday socialization. These internalized conceptions are comprised of the extent to which all community members endorse that people with a mental illness will be devalued (i.e., lose status) and discriminated against (i.e., be denied life opportunities). Since official clinical/diagnostic labelling occurs via contact with the system of psychiatric care, expectations of community devaluation now become relevant to the individual. According to Link et al., labelled individuals may then respond to perceived anticipated rejection in two harmful ways: (1) secrecy, or concealing one’s treatment history from others; and (2) withdrawal, or limiting contact to those accepting of one’s condition (e.g., others who share a devalued status by virtue of having a mental illness). Previous empirical studies have demonstrated that labelling-induced stigma is linked with lower self-esteem (Fung et al., 2007; Link, Struening, Neese-Todd, Asmussen, & Phelan, 2001), demoralization (Link, Mirotznik, & Cullen, 1991), depressive symptoms (Link et al., 1991; Ritscher & Phelan, 2004), less adherence with treatment (Fung et al., 2007), constricted social networks (Link et al., 1989) and reduced social integration (Prince & Prince, 2002). Such effects also restrict opportunities to engage in life opportunities through increased unemployment (Link et al., 1991) and loss of housing (Page, 1977). These models highlight the process of what is termed internalized stigma (Corrigan, Watson, & Barr, 2006), whereby people with mental illnesses internalize negative societal stereotypes and experience negative emotional consequences as a result of applying these negative societal notions to the self (Link et al., 2004). Further, the deleterious behavioural coping strategies utilized by individuals with a mental illness to avoid potential harmful effects and to avert perceived anticipated rejection comprise another pivotal mechanism by which stigma operates (Link et al., 1989). These mechanisms (i.e., “internalized stigma” and behavioural coping responses to stigma) are highlighted as possible processes by which stigma might impact individuals designated as being “at risk” for psychosis.
Stigma and labelling among adolescents

Because the identification of individuals as at risk for psychosis typically occurs in adolescence, specific age-related aspects of this developmental period may influence the expression and impact of stigma for this group. Adolescence is a developmental stage during which identity formation is in flux; teens and young adults are faced with the challenge of reaching important developmental milestones, such as consolidating an autonomous self-concept, attaining educational and vocational achievement and forming social networks (Zarrett & Eccles, 2006). Adolescents' neurocognitive capacities also continue to develop during this stage and show differences from adults with regard to experiencing stigma-related social emotions (i.e., embarrassment). Becoming labelled (and all its effects) may impede one's transition into adulthood by interfering with the acquisition of personal assets or competencies, values and social capital (Zarrett & Eccles, 2006). For example, in a qualitative study of adolescents labelled as having mental-health problems, participants reported experiencing significant changes in their familial roles, their educational and career choices and their social standing, expressing specifically that their mental illness label got in the way of their becoming adults (Leavey, 2005). Because adolescence is a developmental period characterized by identity consolidation, the effects of labelling have the potential to be especially damaging as adolescents' self-concepts are less well formed and vulnerable to change. Receiving a label of a serious mental illness such as major depressive disorder, or plausibly the label of risk for serious mental illness such as schizophrenia, during this crucial stage might result in the lasting incorporation of negative conceptions into the foundation of one's social identity, thereby threatening a fundamental sense of normalcy (Wisdom & Green, 2004).

To shed some light on this process of diminishing self-concept, Lally (1989) proposed that after acquiring the label of an "ill person", such a role becomes central in defining an individual's identity. Interacting in this capacity over time diminishes other valued social roles, leaving only the "chronically ill" role behind. An engulfment into a stigmatized identity occurs when a person endorses beliefs of incompetence, defines him- or herself as "just being mentally ill", believes that others perceive him or her in terms of illness characteristics and perceives a future defined by disability. It is plausible that adolescents, whose identity formation is as yet in flux, may be particularly vulnerable to engulfment into a stigmatized identity. This is supported by in-depth interviews with adolescents with depression (Wisdom & Green, 2004), many of whom reported feeling that their diagnosis was an important part of their personal identity and that their condition might be permanent.

Stigmatized public attitudes toward mental illness are so pervasive that awareness of them is found even among young children (Wahl, 2002) and that children and adolescents can suffer their effects in terms of internalized stigma (Pescosolido, Perry, Martin, McLeod, & Jensen, 2007). According to community surveys (Penn et al., 2005; Pescosolido, Perry et al., 2007), both adults and youth
think that adolescents with a mental illness are violent and likely to be rejected from social circles. Almost half of adults who participated in the nationally representative US General Social Survey endorsed the statement that “getting mental-health treatment would make a child an outsider at school” and that the stigmatization initiated during this time would persist into adulthood (Pescosolido, Perry et al., 2007). Similarly, adult respondents agreed that children with attention-deficit/hyperactivity disorder (ADHD) or depression were significantly more likely than other kids to harm themselves or others (Pescosolido, Fettes, Martin, Monahan, & McLeod, 2007). Furthermore, this perception of dangerousness was exacerbated (a fivefold increase) when “mentally ill” labels were independently offered (Pescosolido, Fettes et al., 2007). Youth respondents also shared a negative perspective, agreeing that peers with schizophrenia were more violent (72%), more suicidal (76%) and less likely to do well in school (70%; Penn et al., 2005). These attitudes extend beyond a diagnostic label, impacting treatment utilization, as evidenced by more than a third of adolescents reporting that there are moderate to high levels of stigma associated with seeking help for mental-health problems (Chandra & Minkovitz, 2006). Finally, while prior contact with people with a mental illness has been shown to decrease stigma in adults, it had the opposite effect among youth, increasing stigma through perceptions of personal blame and dangerousness (Corrigan et al., 2005). Taken together, these findings suggest that labelled adolescents’ experience of stigma is at least equal to and perhaps more troublesome than that of adults.

Although the impact of the label of being in an “at-risk” mental state has yet to be systematically examined, two recent studies of approximately 60 teens (ages 12–18 years) have each documented changes in adolescent well-being and self-concept during diagnosis and treatment of disorders such as disruptive behaviour disorder, affective disorders and posttraumatic stress disorder (Moses, 2009a, 2009b). Despite reporting relatively low levels of perceived public stigma, diagnosed adolescents in Moses’ study (2009b) endorsed expectations of societal devaluation toward youth receiving mental-health treatment, such as being teased, harassed, or looked down upon by peers. About half of respondents also reported experiencing peer rejection, such as being disrespected and others “hurting their feelings”, which they attributed to use of mental-health services. These studies demonstrate that several key mechanisms proposed by modified labelling theory (Link et al., 1989) can be operative in adolescents. For example, adolescents who reported greater perception of societal devaluation were also more likely to report more self-stigma (such as feeling ashamed, different, or uncomfortable), which in turn was linked with increased secrecy about one’s mental-health problems. Although the direction or causality cannot be established for certain, these stigma-related constructs were strongly associated with psychological well-being: endorsement of societal devaluation and self-stigma were linked with higher levels of depression and societal devaluation was significantly related to lowered self-esteem even after controlling for depression. While most adolescents were found to actively interpret (and in some cases resist) the label of a mental illness at the time of diagnosis, approximately 20% “self-labelled” by naming the mental
illness as a key feature of their identity (e.g., describing “my” psychiatric disorder; Moses, 2009a). Of note, Moses (2009a) indicated that individuals whose onset of illness was later tended to be “non-labellers”, as were boys when compared with girls, suggesting that individuals “at risk” for psychosis (who tend to develop symptoms and receive a risk label in later adolescence and who are primarily male; Woods et al., 2009) might be less prone to “self-labelling”. Further, “self-labellers” had more self-stigma and depression than those who avoided self-labelling. Consistent with the proposal that teens may be particularly vulnerable, adolescents with an earlier age at initiating treatment reported more self-stigma, a higher likelihood of self-labelling and greater secrecy about their problems, regardless of the level of functional impairment (Moses, 2009a, 2009b).

These studies by Moses suggest that similar mechanisms could be at work in terms of the potential impact of stigma on young people identified as being “at risk” for psychosis. However, this is tempered by significant differences between Moses’ cohorts and typical “at-risk” cohorts, including having an established diagnosis (vs. identification as “at risk”). Additionally, the Moses cohorts were characterized by much greater symptom severity and impairment (receiving services across multiple systems) and a higher prevalence of disruptive disorders. The impact of stigma in individuals identified as “at risk” for psychosis remains an empirical question that may be informed by preliminary studies.

**Studies of stigma associated with psychosis and its risk states in patients and families**

Despite the potential consequences of stigma for those identified as “at risk” for psychosis and for their families, research is scarce in this area. However, the few studies involving patients with a first episode of psychosis are illustrative and provide a useful potential point of reference in the examination of early stigma processes. A study by Tarrier and colleagues (Tarrier, Khan, Cater, & Picken, 2007) found that patients suffering from their first episode of psychosis reported experiencing stigma (53%), social exclusion (50%) and physical harassment (38%) as a result of their illness. Parents of patients receiving treatment for their first episode of schizophrenia also highly endorsed negative attitudes about mental illness (Czuchta & McCay, 2001). A qualitative study of family members of patients with recent-onset psychosis revealed themes of labelling, stereotyping, negative emotional reactions and coping strategies discussed earlier in this chapter (Gerson et al., 2009). Consistent with Link et al.’s (2004) definition of stigma, parents recognized that their children were labelled by their diagnoses, internalized the negative stereotypes that were attached to that label and responded with feelings of shame and attempts to conceal their child’s condition. In this same cohort of families, anticipated stigma was reported, such as fearing that a son with a mental illness would be “treated like a rapist” and that a patient’s siblings would be teased by others (Corcoran et al., 2007). This set of processes is exemplified by the statement (Gerson et al., 2009): “People tend to stigmatize people who are mentally ill. I’m kind of ashamed, really, to tell somebody”. Anger and frustration
accompanied a sense of hopelessness about the permanence of the label according to another parent of an individual with recent-onset schizophrenia: “Now we have to deal with this ‘s’ word ... it’s like, oh, this is a dirty word. I almost had a breakdown myself and I said, ‘This is what I am dealing with and I’m going to be dealing with it for the rest of my life and I am angry’”. Worst of all, these negative stereotypes were viewed as encompassing one’s entire identity and predicting one’s future experiences. As one mother shared, “I talked to a social worker who was nice, but she said I should look at it as that I have three kids, two are good and one is not good”. Another parent remembered that her doctor “told my son to get used to it and he would be like this for the rest of his life” (Gerson et al., 2009).

Working backward from the initiation of treatment, researchers have attempted to assess stigma prior to this point of first treatment for psychotic symptoms. Much of this literature is focused on the role of stigma in help-seeking behaviour through retrospective interviews done at patients’ first contact with the mental-health system. These studies are especially important in light of findings that significant delays occur in obtaining care upon first observing psychotic symptoms (Singh & Grange, 2006) and that reducing these delays may have a positive impact on mental-health outcomes (Norman & Malla, 2001). Franz and colleagues (2010) conducted qualitative interviews with 12 African-American family members about their experiences before their relative began treatment for psychosis. Using a grounded theory approach, they found that the themes generated from the interviews closely resembled the constructs of modified labelling theory (Link et al., 1989; Link & Phelan, 2001), beginning with caregivers’ recognition of society’s negative reactions toward someone labelled with a serious mental illness and continuing on to their consequent efforts to cope with stigma. Relatives cited both early signs of psychotic behaviour (“if they do something funny”) and the official psychiatric diagnosis as sufficient labels that elicited stigmatizing attitudes and behaviours from the public, such as social distance (“They look at them strange. They don’t seem like they want to be around them” and “They think, ‘Don’t fool with them because they are crazy’. They don’t treat them nice.”) and fear of unpredictability (“They automatically think, ‘He’s just gonna do something outrageous’. ”). Family members generally regarded their relative’s condition with empathy and compassion and employed several strategies to avoid a label altogether, such as using alternative explanatory models involving external factors (Franz et al., 2010). Two small, retrospective, qualitative studies of patients’ experiences confirmed many of these findings and stressed the critical importance of stigma-related coping strategies in prolonging treatment delays (Boydell, Gladstone, & Volpe, 2006; Judge, Estoff, Perkins, & Penn, 2008). Such strategies reflect both relatives’ and patients’ fear of the consequences of labelling and included secrecy (“You really don’t want anyone to know because no one wants to be looked at in a different way, as abnormal”; Franz et al., 2010), withdrawal (“I tried to help myself. I stayed in solitary for six months ... in a motel room”; Franz et al., 2010) and avoiding help (“I wouldn’t tell anyone about the voices. It never felt safe to do that. I pictured myself being locked up in a cell if I told the truth”; Judge et al., 2008).
Findings from these studies, which report experiences pertaining to stigma before entering treatment, suggests that internalization of negative attitudes and related behavioural coping responses may constitute processes by which stigma might affect individuals before they are labelled by the mental-health care system as having an established disorder. Further indirect evidence for possible stigma processes during the putative prodromal period comes from studies interviewing parents concerning observed changes during the course of illness among individuals at elevated risk for psychosis (Corcoran et al., 2003). Parents in some cases described their children during their evolution of symptoms as having undergone a profound alteration in identity, which suggests the potential initiation of internalized stigma processes; i.e., “he adopted a whole new identity” and “now my daughter is a case study”. This same cohort of family members of putative prodromal patients, studied together with family members of patients with recent onset of psychotic disorder, were also evaluated in terms of stigma using the Opinions about Mental Illness scale (OMI; Cohen & Streuning, 1962) and the Family Experiences Interview Schedule (FEIS; Tessler & Gamach, 1995). This study, by Wong and colleagues (2009), suggested that stigma experienced by families of individuals in the early stages of a psychotic disorder may be less evident, particularly in those identified as “at risk” rather than those with a recent onset of psychotic disorder. Reflecting minimal endorsement of public stigma, the majority of families agreed with positive/supportive statements about people with mental illnesses concerning government assistance, voting rights, employment, trustworthiness and religious/spiritual coping, while few family members agreed with negative stereotypes and generalized stigmatizing statements, including the limited ability of people with mental illnesses to perform certain tasks, hold positions in law enforcement/public safety and be trustworthy around children (Wong et al., 2009). However, the items that were moderately or highly endorsed by families indicate areas where internalized stigma might potentially take root. For instance, the majority of both groups agreed that “dealing with a person with a mental illness can at times be like dealing with a young child” and that “although people with mental illnesses can look okay, it is important to remember that they are ill”, and at least 44% of both groups agreed with statements that people with mental illnesses are irrational and that their condition is permanent (Wong et al., 2009). One third of family members of individuals in an “at-risk” state avoided going to social events due to their relative’s emerging illness, although other stigma-related coping strategies were relatively low compared to families of first-episode patients who anticipated social rejection from their community (54%), felt ashamed and embarrassed about their relative’s illness (64%) and felt the need to conceal it from others (64%). The authors discuss an important caveat to these findings in that the “at-risk” group only includes families who recognized putative prodromal symptoms in their relative, who then voluntarily sought treatment in a specialty research programme, as compared to the families of the recent-onset group, whose relatives often had an involuntary admission after developing a psychotic episode. By selection, this sample of families of individuals identified as being “at risk” might be less likely to be concerned about stigma associated
with participation in this type of programme when compared with undetected community members with putatively prodromal symptoms (or perhaps with individuals who are identified as at risk for psychosis in the community, outside of an academic research setting). Nonetheless, these studies suggest that some precursors of stigma may develop early in the course of psychotic disorder—even during its risk state—and that they have the potential to take on greater influence, particularly if psychosis progresses and more intensive mental-health treatment is required.

The role of race and ethnicity in the effects of stigma

It is important to consider the role of race and ethnicity in perceptions of stigma and stigma’s role in potentially complicating the help-seeking process during the pre-psychotic phase. Although one can only draw tentative conclusions from this small body of existing literature, studies in two cohorts have highlighted pervasive fear of labels of mental illnesses, prolonged treatment delays and police involvement in the hospitalization of African Americans with emerging psychosis (Franz et al., 2010; Gerson et al., 2009). Previous studies have found that African Americans have more concerns about the stigma of receiving treatment (Cooper-Patrick et al., 1997) and endorse more stigmatizing attitudes toward people with mental illnesses than Caucasians. Multiple studies, including those that document high rates of involuntary hospitalization among African Americans in the United States and African Caribbeans in the United Kingdom (Burnett et al., 1999; Commander, Cochrane, Sashidharan, Akilu, & Wildsmith, 1999; Morgan et al., 2005a, 2005b), as well as qualitative studies (Alvidrez & Havassy, 2005; Cooper-Patrick et al., 1997; Keating & Robertson, 2004), provide evidence that stigma is a deterrent to help-seeking in these ethnic groups. Thus, future studies of the relationship between stigma, course of illness, labelling and diagnosis and service utilization, might productively incorporate further examination of the complex dynamics introduced by ethnic, racial and sociocultural factors.

Social perception, stereotype threat and cognitive neuroscience

As described, mental-illness stigma may have myriad adverse psychological effects via internalization of pejorative stereotypes and harmful stigma-related coping strategies. Tools from social and cognitive affective neuroscience can help us to understand the mechanisms underlying these stigma processes—including the neural circuitry involved and how this may be modified by cognitive deficits and symptoms typical of the psychosis risk syndrome—and have effects on clinical course and functional outcome in young people identified as “at risk” for psychosis. Components of social stigma rely on social processing and understanding of self and other, mentalizing and one’s own emotional experience, which may be compromised in psychotic disorders and their risk states. The processes of labelling and internalizing stigma require a sense of identity, as a
distinct entity, that entails an ability to differentiate self and other. Attribution is also relevant, as in determining “agency” or the feeling of being involved in an action versus the action originating from a source other than the self; this is subsumed by the parietal cortex, especially the intraparietal lobule (IPL; Ruby & Decety, 2001, 2003, 2004; Seger, Stone, & Keenan, 2004). Mentalizing and perspective taking is also relevant to stigma processes and involves the medial prefrontal cortex (mPFC), posterior cingulate/precuneus, temporoparietal junction (TPJ) and superior temporal sulcus (STS; Amodio & Frith, 2006; Gallagher et al., 2000; Ochsner et al., 2004; Ruby & Decety, 2004; Saxe, 2006; Vogley et al., 2001; Vollm et al., 2006). Caudal regions are considered to be key to mentalizing tasks (Benoit, Gilbert, Volle, & Burgess, 2010; Gilbert et al., 2007).

Developmental theories suggest that one way we define ourselves is through “reflected self-appraisals”, a process by which we internalize our ideas of other people’s beliefs about us (see Pfeiffer et al., 2009). In the case of an at-risk patient experiencing stigma, his or her imagined idea of what others think about him or her is informed by his or her perception of social cues such as emotional reactions from others, which may also be affected by disease processes. The study of social perception requires recognition and response to a social-affective stimulus (Ochsner, 2008); brain regions implicated in this process include inferior occipital lobe and temporal lobe structures such as the superior temporal sulcus (STS), fusiform face area, temporal poles (Adolphs, 2001) and amygdala, which is believed to have a central role in processing the social relevance of information gleaned from faces by leading the viewer to orient toward the eyes.

The emotional experience of stigma may include emotions such as shame or embarrassment, emotions that require mentalization and are related to regions of the anterior rostromedial prefrontal cortex (rmPFC) and the temporal parietal junction/superior temporal sulcus (TPJ/STS; Takahashi, et al., 2004). Adolescents may be particularly vulnerable to shame as these underlying brain regions show increased activity in teens experiencing social emotions such as embarrassment or guilt when compared to adults engaged in the same social emotional task. Thus, the emotional experience of stigma may be particularly salient in this younger population of at-risk teens.

Beyond emotional consequences for the individual, there are behavioural consequences of stigma. At-risk patients may find themselves in situations where their actions and behaviours confirm negative stereotypes. The basic premise is that a person’s “social identity”—defined as group membership in categories such as mentally ill, age group, gender, religion and ethnicity—has significance when rooted in concrete situations. For individuals labelled “at risk”, any social situation that requires intellectual performance—a job interview, a test-taking situation, a diagnostic psychiatric test—can evoke concerns that they will be judged not on the basis of their ability, but rather on the basis of a negative stereotype about the intellectual ability of all individuals with a specific designation or label—a concern introduced above as “stereotype threat” (Purdie-Vaughns, Steele, Davies, Dittmann, & Crosby, 2008; Steele, 1997; Steele & Aronson, 1995; Steele et al., 2002). Such a threat can prove sufficiently stressful to impede cognitive
performance and may occur regardless of the accuracy of the label (Steele et al., 2002; see also Crocker & Major, 1989).

Laboratory research on “stereotype threat” identifies several cognitive and affective processes underlying the effect of this threat on behaviour, including not only intellectual performance but also physiological stress due to arousal (Ben Zeev, Fein, & Inzlicht, 2005; Blascovich, Spencer, Quinn, & Steele, 2001), negative thoughts that consume executive resources, such as working memory (Beilock, Rydell, & McConnell, 2007; Cadinu, Maass, Rosabianca, & Kiesner, 2005; Schmader & Johns, 2003) and self-regulatory changes in the aims of managing thoughts and emotions relevant to the stereotype (Johns, Inzlicht, & Schmader, 2008; Seibt & Förster, 2004). Although a dearth of studies focuses on the neurological implications of contending with stigma in concrete situations, neuroscience techniques have been germane to exploring the role of specific neural regions and systems implicated in stereotype threat. Using fMRI, concerns about being perceived through the lens of a negative stereotype have been shown to undermine cognitive performance in two ways. First, it disrupts normal recruitment of cognitive areas required for intellectual performance—specifically, failure to show increased recruitment of the inferior prefrontal cortex, left inferior parietal cortex and bilateral angular gyrus, all areas associated with learning performance (Krendl et al., 2008). Second, it increases the recruitment of areas that allow for the processing, regulation and control of emotions—specifically, increased activation in the ventral anterior cingulate cortex, an area that has been associated with emotional self-regulation and processing of affective information (Krendl et al., 2008).

These results were supported and further specified by Wraga and colleagues (2007) in an attempt to link brain activation associated with affective processing and reduced performance under stereotype threat. Functional MRI analysis revealed that individuals under stereotype threat showed increased activity in areas associated with emotional self-regulation (rostral-ventral anterior cingulated cortex) and social knowledge (right orbital gyrus; Wraga et al., 2007). The emerging picture suggests that merely contending with stigma in the context of intellectual performance leads to both reductions in cognitive efficiency and increases in affective processing and recruitment of brain areas associated with emotional regulation. Although our understanding of how stigma is linked with underlying brain structures is still in its infancy, the above links between social perception, stereotype threat and cognitive neuroscience provide a promising base from which to launch future investigations. Also, these consequences of stereotype threat may be particularly problematic for at-risk individuals, who already have relative impairments in motivation, working memory, learning and affect regulation.

Future directions

This review of definitions of stigma and mechanisms by which stigma occur reveals that internalization of negative societal stereotypes and subsequent stigma-
related coping responses harmfully affect people diagnosed with a mental illness, in particular adolescents, and might also be operative in individuals labelled as being “at risk” for psychosis. The existing studies of stigma in patients with recent-onset psychosis and their families initially corroborate that internalized negative stereotypes about people with mental illnesses and related coping mechanisms to avoid labelling may be the most salient stigma-associated constructs for further study in this area. However, there are no studies yet of stigma in these patients themselves and different mechanisms may be more relevant for them; for instance, research on identity engulfment for the young individuals recently labelled. It appears plausible that stigmatization originates in the prevalent negative public stereotypes toward adolescents with mental illnesses and further develops through these two processes of internalization and potentially maladaptive coping, especially through secrecy. The emphasis of these themes among young people experiencing their first episode of psychosis also supports this assertion and initial lines of evidence make plausible the suggestion that these stigma-related processes may in some circumstances take root during the phase in which one is “at risk” for psychosis, prior to diagnosis and treatment initiation. However, in the single study of families of individuals “at risk” for psychosis in an academic clinical research programme, endorsement of stigma in these areas was still relatively low (Wong et al., 2009). Future studies examining the emergence of stigma during the “at-risk” phase must partial out whether these processes precede or coincide with the full manifestation of psychotic symptoms, the official diagnosis of a psychotic or other mental disorder and/or mental-health treatment. Furthermore, Wong and colleagues (2009) focused on families of individuals who were at elevated risk for psychosis and not the individuals themselves, a critical gap in the literature that will be addressed in future studies. Intriguing findings regarding race and stigma warrant an examination of the possible intersection between racial, ethnic and sociocultural issues and stigma-related processes during the “at-risk” phase of psychosis in future studies. Finally, initial studies concerning neurological and behavioural correlates of stigma might further inform our understanding of the neural structures that underlie any experience of stigma among “at-risk” patients, which may themselves be affected by disease processes. Future studies of stigma and cognitive neuroscience might further elucidate the neural processes underlying stigma in at-risk patients who, as a potentially stigmatized group, are at risk of perceiving chronic stress, threat and marginalization as part of their everyday experience.

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