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Scaling back goals and recalibration of the affect system are processes in normal adaptive self-regulation: understanding ‘response shift’ phenomena

Charles S. Carver\textsuperscript{a,}\textsuperscript{*}, Michael F. Scheier\textsuperscript{b}

\textsuperscript{a}Department of Psychology, University of Miami, Coral Gables, FL 33124-2070, USA
\textsuperscript{b}Department of Psychology, Carnegie Mellon University, city Pittsburgh, PA 15213, USA

Abstract

This comment addresses a set of phenomena that have been labeled ‘response shift’. We argue that many of these phenomena reflect recalibration of a goal-seeking system and an affect-management system, both of which are involved in normal adaptive self-regulation. In brief, we hold that these systems act as feedback control mechanisms. The reference values for both systems continuously undergo gradual recalibration. Because in most circumstances the adjustments tend to occur with equivalent frequency in both directions, their cumulative effect is minimal. In situations of either unusually prolonged goal attainment (and over attainment) or unusually prolonged adversity (as occurs, e.g., with deteriorating health), the cumulative effect can be substantial. We believe that these latter recalibrations of reference value account for many response shift phenomena. Other such phenomena are accounted for by the principle of hierarchical organization among the self-regulatory goals that comprise the self. © 2000 Elsevier Science Ltd. All rights reserved.

Keywords: Response shift; Self-regulation; Quality of life; Theory; Goals; Reference value

People who experience periods of continuing adversity, such as a deterioration in health status, often fail to show the reduction in subjective quality of life that would be expected from an objective account of the adversity. It sometimes appears from the self-reports of such persons that they are evaluating their experiences according to different criteria than they used before. Such changes in responding have been given the label response shift (Howard et al., 1979; Sprangars and Schwartz, 1999).

\textsuperscript{*} Corresponding author. Tel.: +1-305-284-2817; fax: +1-305-284-3402.
E-mail address: ccarver@miami.edu (Charles S. Carver).

Response shift

The concept of response shift derives from an earlier, broader discussion of the meaning of observed change (or absence of change). Golembiewski et al. (1975) pointed out that a change observed over time might reflect any of three things. It might reflect a true change in the level of the measured variable (which they called alpha change). This, of course, is the sort of change that social scientists are most interested in. Most of us assume that when we use the same measure repeatedly, it has the same meaning each time we use it.

However, other possibilities do exist. A change (or lack of change) might also reflect a subjective recali-
bration of the measurement continuum, such that its intervals no longer have the same psychological anchors as they had before (beta change). Thus, a man whose health has deteriorated over the past year might continue to express moderate satisfaction with his health because his sense of what is satisfactory has shifted over that year. Yet a third possibility is that a change might reflect a subjective reconceptualization of what defines the variable (gamma change). People might decide that what constitutes ‘health’ is different from what they believed earlier.

These various possibilities create a serious methodological challenge. If the internal mechanism that determines feelings of subjective wellbeing uses a different basis for those reports from one time to another, it creates a serious problem in comparing reports of wellbeing at one time point (e.g. before the onset of the adversity) with reports made later. The person, in effect, may be using different scales in the two measurements. If the researcher’s interest is in changes in wellbeing over that time period (as opposed to differences between persons within a cohort who undergo similar experiences), this creates a daunting methodological problem (though see Norman and Parker (1996) and Schwartz and Sprangers (1999) for suggestions about possible ways to approach this issue).

Three reflections of response shift

The concept of response shift is intended to address beta and gamma types of change. Sprangers and Schwartz (1999) proposed a model of such phenomena in the health domain, in which they suggested potential antecedents and behavioral mechanisms by which they occur. They argued that response shifts can be of three sorts: a change in the respondent’s internal standards of measurement (recalibration), a change in the respondent’s values (the relative importance of aspects of the variable under examination), or a redefinition or reconceptualization of the variable.

As an example, Sprangers and Schwartz (1999) described several potential responses to a breast cancer diagnosis. One woman’s response is to engage in social comparison, find she is better off than many other women, and adjust her internal standard to reflect the fact that the ‘doing poorly’ part of the continuum has more gradations than she had appreciated. Another woman’s response is to reevaluate the relative importance of career versus family life, adjusting the balance of the values that define her sense of self. Yet another’s response is to develop a new sense of purpose in life, resulting in a change in her conceptualization of the very meaning of quality of life.

Sprangers and Schwartz conceptualized these three changes as being relatively distinct from each other. In the rest of this article, we embed these phenomena in the context of a broader set of ideas about the self-regulation of behavior more generally. In so doing, we argue that what may seem to be diverse phenomena arise from an interwoven set of processes. Further, we argue that the phenomena labeled response shift reflect the operation in extreme circumstances of processes that are always at work in normal adaptive self-regulation. These processes can lead to the sorts of changes that Sprangers and Schwartz (1999) focused on. However, they can also lead to shifts in the opposite direction — that is, to becoming more stringent and demanding rather than less so.

In the next section we describe the essence of the model of self-regulation with which we work. Then we indicate how that model would account for the response shift phenomena just listed.

Control processes in adaptive self-regulation

For many years we have held that human behavior embodies feedback control processes (Carver and Scheier, 1981, 1998, 1999a). The core construct in this view is the discrepancy reducing feedback loop. Because the nature of feedback loops is not always clearly understood, we will be explicit about it. A discrepancy reducing feedback loop is a system of four elements in a specific organization (Miller et al., 1960; MacKay, 1966; Powers, 1973). The elements are an input function, a reference value, a comparator, and an output function (Fig. 1).

An input function brings information in. In applying

![Schematic depiction of a feedback loop](image)

**Fig. 1.** Schematic depiction of a feedback loop. In such a loop a sensed value (input function) is compared to a reference value or standard, and adjustments are made (if necessary) in an output function (behavior) to shift the sensed value in the direction of the standard. The final element in this figure — disturbance — conveys the sense that factors external to the system can also influence the nature of the current state.
the idea to behavior, this function is equivalent to the perception of current conditions. The reference value is equivalent to a goal. The comparator is a function that compares the input to the reference value. This comparison yields one of two outcomes: either the values are discriminably different from one another or they are not.

Following this comparison is an output function. This is equivalent to behavior, though sometimes the behavior is not overt. If the comparison yields a ‘no difference’, the output function remains whatever it now is. This may mean no output or it may mean that the ongoing output continues. If the comparison yields ‘discrepancy’, the output function changes.

In a discrepancy reducing loop, the aim of the output function is to diminish or eliminate discrepancies between input and reference value — to create conformity between the two. This conformity process is reflected in attempts to approach or attain valued or desired goals. The goal can be a relatively constant or recurring one (e.g. to be an honest person) or it can be a ‘moving target’ (e.g. taking a vacation or developing through the stages of a career). In either case, a discrepancy reducing system tries continuously to make reality match the goal value.

Reliance on the feedback loop as the building block of behavior may seem esoteric (though see, e.g., Heise, 1989). However, the connection of this construct to the goal concept places it within the mainstream of contemporary personality-social psychology. That is, as noted earlier, the loop’s reference value acts as a goal for behavior, and goal constructs are very prominent in today’s personality-social psychology (e.g. Pervin, 1982, 1989; Elliott and Dweck, 1988; Austin and Vancouver, 1996; Carver and Scheier, 1998, 1999a). We simply hold that when goals are being used, they are serving as reference points for feedback processes that are involved in creating the behavior.

Feelings

We also have proposed a way of thinking about how feelings arise in the course of action, via another feedback loop (Carver and Scheier, 1990, 1998). This loop operates automatically in parallel to the behavior-guiding one. One way to describe what this system does is to say that it is checking on how well the behavior loop is doing at reducing its discrepancies over time. Thus, the perceptual input for the affect-creating loop is a representation of the rate of discrepancy reduction in the action system over time.

1 Discrepancy-enlarging feedback loops also exist. Although they play an important role in self-regulation, to discuss them here would raise more complexity than is warranted (for broader treatment see Carver and Scheier, 1998).

We have found an analogy useful here. Because action implies change between behavioral states, consider behavior as analogous to distance (change from one physical position to another). If the action loop deals with distance, and if the affect loop’s input is the action loop’s progress over time, then the affect loop is dealing with the psychological equivalent of velocity.

We do not hold that the ‘velocity’ input creates affect in and of itself, because a given rate of progress has different affective consequences under different circumstances. As in any feedback system, this input is compared to a reference value (cf. Frijda, 1986): a desired or acceptable rate of behavioral discrepancy reduction. As in other feedback loops, the comparison checks for a deviation from the standard. We suggest that the result of this comparison process is manifest phenomenologically as affect, feeling, a sense of positiveness or negativeness. Several studies have yielded evidence that tends to support this view (for review see Carver and Scheier, 1998).

The feeling also has an influence on subsequent behavior. A feeling implies a discrepancy in velocity, or rate of progress. The output function of this loop adjusts the rate of progress. Negative feelings lead to efforts to catch up. Positive feelings lead to coasting. In both cases, the normal effect of this adjustment is to return affect to neutral.

Sometimes adjustments are straightforward — literally go faster. Sometimes the matter is less straightforward. The rates of many ‘behaviors’ are not defined by literal pace of motion. Rather, they are defined in terms of choices among actions, or even potential programs of action. For example, increasing one’s rate of progress on a work assignment may mean choosing to spend a weekend working rather than relaxing. Increasing one’s rate of being kind means choosing to undertake an action which reflects that value. Thus, adjustment in rate often translates into other terms, such as concentration or reallocation of time and effort.

In some ways, this layered model of affect and action resembles a car’s cruise control. If actions are moving too slowly toward some goal, negative affect arises. The person responds with more effort, trying to catch up. If progress is faster than necessary, positive affect arises, and the person eases back. The car’s cruise control is very similar. Starting up a hill, the car slows. The cruise control responds by feeding the engine more gas, bringing the speed back up. As the car crosses the hill’s crest and rolls downhill too fast, the system pulls back on the gas and drags the speed back down.

It should be apparent from this discussion that the behavior system and the rate system work in concert with one another. Both are involved in the flow of action. They influence different aspects of the action, but both are always involved. Indeed, the fact that the rate system can affect what programs of action are
undertaken implies that their operation is deeply interwoven.

Confidence and doubt

In our view the mechanism producing subjective affect also yields a sense of confidence versus doubt for the immediate future. That sense of confidence or doubt can influence subsequent action, but its influence is often modulated by other forces. Our view is that when people encounter adversity in trying to move toward their goals, they periodically experience an interruption of their efforts and assess in a more deliberative way the likelihood of success (e.g. Carver and Scheier, 1981, 1990, 1998). In effect, people suspend the behavioral stream, step outside it, and evaluate the situation in a more thoughtful way than occurs while acting. In this assessment people depend heavily on memories of prior outcomes in similar situations, but also consider such matters as additional resources they might bring to bear or alternative approaches to the problem.

Whether deriving more from immediate situational experience or from consolidated memories, the expectancies with which people return to action influence subsequent behavior. Given confidence of eventual success, the person returns to goal-directed effort. If doubts are strong enough, the result is a tendency to disengage from efforts, and potentially from the goal itself (Kukla, 1972; Klinger, 1975; Wortman and Brehm, 1975; Carver and Scheier, 1981, 1990, 1998).

This theme — that confidence versus doubt leads to divergence in response applies to a surprisingly broad range of literatures (see ch. 11 of Carver and Scheier, 1998). One of its more obvious applications is to the literature of stress and coping. Individual differences in confidence influence how people cope with adversity. Confident people take a goal-engaged approach to coping, whereas doubtful people cope in ways that imply disengagement (e.g. Scheier et al., 1989; Carver et al., 1993; Carver and Scheier 1999b).

Costs and benefits of disengagement

Disengagement has both costs and benefits. On the negative side of the ledger, certain problems in life arise from giving up too quickly. Someone who lacks the persistence to keep trying when things get difficult never attains anything. Persistence is a very important quality.

Yet giving up is also important. Indeed, disengagement is a necessity, a natural and indispensable part of self-regulation. If people are ever to turn away from unattainable goals, back out of blind alleys, they must be able to disengage — give up and start over somewhere else. This is particularly obvious regarding concrete goals for which disengagement has little cost: People have to remove themselves from literal blind alleys and wrong streets, and give up plans that have been disrupted by unexpected events. This response is also important, however, with regard to certain goals that are deeply connected to the self. For example, it can be important to disengage and move on with life after the loss of a close relationship (e.g. Orbuch, 1992; Cleiren, 1993; Stroebe et al., 1993).

Sometimes disengaging and moving on means shifting focus to something else entirely (e.g. for a person who's had a heart attack, it may mean retiring from work and turning to the hobby that's been neglected for so long). Sometimes it means abandoning a high aspiration in the domain in question and substituting a less lofty one (e.g. for someone whose arthritis is getting worse, it may mean playing doubles tennis instead of singles; for someone whose health is failing, it may mean reading about exotic places, rather than actually traveling; for infertile couples, it may mean giving up trying to conceive and turning to adoption). In either case, adaptive disengagement has the following characteristic: Giving up is an adaptive response when it leads to the taking up of other goals. It thus permits the person to reengage and move ahead in some aspect of life. This is a key point, with many implications of its own.

Shifts in velocity standards

The systems regulating behavior and affect are dynamic, undergoing continuous recalibration. That is, both the system regulating behavior and the system regulating affect can undergo changes in reference value during the course of extended experience in a given domain of activity. In effect, both systems can shift their aspirations. In this section we address this process with regard to the affect system, then we return to the behavior-regulating system.

As people accumulate experience in a domain, adjustments emerge in the expected pacing of the behavior (cf. Lord and Hanges, 1987). There is a kind of recentering of the system around the experience. The adjustment that takes place can be either upward or downward, depending on the nature of the experience.

Consider first upward adjustments. As an example, a person who gains work-related skills often undertakes greater challenges, requiring quicker handling of action units. Upward adjustment of the rate standard means that the person now will be satisfied only with faster performance. Such a shift has the side effect of decreasing the potential for positive affect and increasing the potential for negative affect, because there now is more room to fail to reach the rate standard and less room to exceed it. Recall, however, that the shift was induced by a gain in skills. The change in skill tends to counter the shift in regions of potential success and failure. Thus, the likelihood of negative affect (vs positive affect or no affect) remains fairly constant.
Now consider a downward adjustment. For example, a person whose health is failing may find that it takes longer to get things done than it used to. This person will gradually come to use less stringent rat standards. A lower pace will then begin to be more satisfying. One consequence of this downward shift of standard is to increase the potential for experiencing positive affect and to decrease the potential for negative affect, because there now is less room for failing to reach the rate standard and more room for exceeding it. The failing health, however, tends to counter the shift in regions of potential success and failure. Again, then, the net result is that the likelihood of negative affect (vs. positive and neutral) remains fairly constant.

Such changes in comparison value do not happen quickly or abruptly. Shifting the reference value downward is not people's first response when they have trouble maintaining a demanding pace. First they try harder to keep up. Only more gradually, if they continue to lag behind, does the rate-related standard shift to accommodate. Similarly, the immediate response when people's pace exceeds the standard is not an upward shift in reference value. The more typical response is to coast for a while. Only when the overshoot is frequent does the standard shift upward.

We believe that adjustments in these standards occur automatically and involuntarily, but slowly. Such adjustments themselves appear to reflect a self-corrective feedback process (Fig. 2). This feedback process is slower than the ones focused on thus far, involving a very gradually accumulating shift.

Let us consider this last point more closely. Assume for the moment that a signal to adjust the standard occurred every time there was a signal to change the output, but that the former was much weaker than the latter — say, 5% of the latter. Given this arrangement, it would take a fairly long time for the standard to change. Indeed, as long as the person deviated from the standard in both directions (under and over) with comparable frequency, the standard would never change noticeably, even over an extended period. Only with repeated deviation in the same direction could there be an appreciable effect on the standard.

Such shifts in reference value (and the resultant effects on affect) would imply a mechanism within the organism that functions to prevent both the too-frequent occurrence of positive feeling and the too-frequent occurrence of negative feeling. That is, the (bidirectional) shifting of the rate criterion over time would tend to control pacing of behavior in such a way that affect continues to vary in both directions around neutral, roughly the same as it had before. The person thus would experience more or less the same range of variation in affective experience over extended periods of time and changing circumstances (see Myers and Diener 1995), for evidence of this.

This line of reasoning is not entirely new. What we are describing here resembles in some respects what Solomon (1980) and Solomon and Corbit (1974) described as the long-term consequences of an opponent process system (see also Helson 1964 regarding the concept of adaptation level).

Scaling back on behavioral goals

The principle of gradual adjustment of a standard also operates at the level of behavioral goals (Carver and Scheier, 1981, 1998). Sometimes progress toward a goal is going poorly, expectancies of success are dim and the person wants to quit. Rather than quit altogether, the person trades this goal for a less demanding one. As noted earlier, trading in a goal is a kind of limited disengagement, in the sense that the person is giving up the first goal while adopting the lesser one. However, this limited disengagement keeps the person engaged in activity in the domain he or she had wanted to quit. By scaling back the goal — giving up in a small way — the person keeps trying to move ahead — thus not giving up, in a larger way.

Small-scale disengagement occurs often in the context of moving forward in broader ways. An empirical
example pertaining to health comes from research on couples in which one partner is becoming ill and dying from AIDS (Moskowitz et al., 1996). Some healthy subjects initially had the goal of overcoming their partners' illness and continuing to have active lives together. As the illness progressed and it became apparent that that goal would not be met, it was not uncommon for the healthy partners to scale back their aspirations. Now the goal was, for example, to do more limited activities during the course of a day. Choosing a more limited and manageable goal ensures it will be possible to move successfully toward it. The result was that even in those difficult circumstances, the person experienced more success than would otherwise have been the case and remained engaged behaviorally with efforts to move forward.

How does the scaling back of goals within a domain take place? We believe the answer is the same as in the case of affect: if the loop’s output function is inadequate at moving the input toward the standard, a second (slower-acting) process moves the standard toward the input (Fig. 2). The scaling back of behavioral goals thus would involve the same structural elements as are involved in the recalibrating of the affect system.

**Shifting from one behavioral goal to another: the hierarchical self**

Sometimes people who find themselves unable to attain a behavioral goal in a given domain are unable to scale back to a lower aspiration in the same domain. Sometimes disengagement leads instead to shifting to a goal in a different domain. In terms of the

![Diagram of hierarchical arrangement among goals that constitute the self.](image)

Fig. 3. Hierarchical arrangement among goals that constitute the self. Concrete behavioral goals (e.g. Box A) acquire importance by their links to the attainment of higher-order goals (Box 1, and ultimately the overall idealized sense of self). If something precludes the attainment of such a goal, people typically have alternate paths to the higher goal (e.g. being prevented from attaining goal A may cause the person to shift to pursuit of goal B). Even a more dramatic loss of possibilities (e.g. its becoming impossible to attain goal 1) usually can be addressed by alternate paths to the yet-higher goal (e.g. turning to behavioral goal C, which serves goal 2, which also enhances the idealized sense of self).

Sprangers and Schwartz (1999) discussion, sometimes people seem to change their values — diminishing the importance of some goals and enhancing the importance of others. How does this model address such changes?

To answer this question entails discussing one more principle of the self-regulatory model. Specifically, people’s goals vary in level of abstraction (Fig. 3). Programmatic behavioral goals acquire their importance from the fact that their attainment serves the attainment of broader, more abstract goals (see Powers, 1973; Carver and Scheier, 1981, 1998). This way of thinking about behavior (indeed, about the self) nicely assimilates the fact that people engage in disparate actions to satisfy the same higher-order desire. For example, there are many paths to good health: exercise, healthful eating, taking vitamin supplements, getting regular checkups, avoiding cigarettes and alcohol (and other paths, as well).

Sometimes a particular pathway to a high-order value of the self is precluded or becomes disrupted. When that happens, the person turns to another route to attain the same higher-order goal (Fig. 3; see also Wicklund and Gollwitzer, 1982). This, we think, is what happens in cases of 'changing values' as response shift phenomena. Our view is that such shifts in a person's weighting of various aspects of life generally reflect shifts in emphasis among values that are already part of the self, rather than a complete change in what elements are used to define quality of life. As one path to the higher-order value is disrupted, another path becomes more important. Sometimes new goals and paths are adopted that were not present before (Carver and Scheier, 1999c). Even if the change is substantial, however, we believe the newly adopted activity or value will be one that contributes to a preexisting core aspect of the self. One branch of the self is stunted or pruned away, but its basic form remains.

The third reflection of response shift addressed by Sprangers and Schwartz (1999) was reconceptualizing of the construct — that is, changing the subjective conception of quality of life. We would argue that this change is intimately tied to changes addressed in the preceding paragraph. As goals and values within the hierarchy of the self shift in importance, the person's view of the nature of a high quality of life comes to depend on different contributors, weighted differently, than was the case before.

**Response shift as self-regulation**

Let us briefly reiterate how the principles outlined in the preceding sections account for the health-related phenomena Sprangers and Schwartz (1999) labeled re-
sponse shift. When a person encounters continuing adversity (e.g. a deterioration in health), the person experiences distress and tries harder to right things. If these efforts fail, the person experiences continuing distress. If the efforts fail for long enough, another effect emerges: a scaling back of the reference point against which current conditions are compared. This slower-acting feedback process has the effect of recentering the person's subjective reality, both with respect to pacing (and thus with respect to affect), with respect to behavioral aspirations (and thus with respect to successful completion of intended actions), and even (albeit less directly) with respect to choice of goals to pursue.

With a shifted reference point for affect, the person again experiences both positive and negative feelings in response to fluctuating circumstances. This, in turn, yields an emotional life with many of the same characteristics as existed before the onset of the adversity. We view this changing of reference point as being largely automatic and outside the person's voluntary control. We also believe it occurs relatively slowly. It takes time to recover from traumatic, life-altering events and find valued goals to pursue in place of those that were undermined.

We believe that this principle of resetting of reference value of both affect system and behavior system accounts for the recalibration phenomena addressed by Sprangers and Schwartz (1999). Changing standards for affect and changing aspirations for behavior are nearly interchangeable ideas in this context, because the affect and behavioral systems operate in concert.

What about the postulated changes in values and reconceptualization of the nature of wellbeing (the second and third reflections of response shift in the Sprangers and Schwartz model)? In our view, the notion of hierarchicality within the goals and values that define the self provides a logical mechanism for such a change to occur, a mechanism that was absent in the Sprangers and Schwartz (1999) article. As some goals become unattainable, others are substituted, but not indiscriminately. The substitutes typically represent alternative paths to core values of the self.

Certainly questions remain. For example, there doubtlessly are individual differences in the ease or speed with which standards shift. Indeed, some readers may wonder whether recalibration is a universally occurring phenomenon. After all, some people who experience continuing distress lapse into deep depression. This appears quite different from recalibration and response shift. It can be argued, though, that the depression ultimately works toward the same end (Winters et al., 2000). That is, the depression response is most likely to occur when the frustrated goal is deeply connected to the core of the self. Such a goal is not easily abandoned or even scaled back.

Remember, in this regard, that the first response to a discrepancy is not to change the standard, but to try to change present conditions. The standard shifts as those efforts to change present conditions repeatedly fail. The failure itself creates negative affect — frustration, sadness, dysphoria. It may be that the experience of the person who lapses into depression simply reflects a slower change in the standard than occurs for other people. What causes some people to recalibrate more readily than others is a matter for future research to examine.

**Adaptive consequences of recalibration**

We began this article by noting a methodological reason why response shift phenomena matter. We close by pointing to a conceptual reason why they matter. They matter by virtue of their consequences for the people in whom they are occurring. As noted earlier, the scaling back of aspirations, although a partial giving up, has the broader effect of preventing the person from giving up completely. The scaling back of goals and the recalibration of the affect-creating mechanism thus keep people engaged in the pursuit of the domains of interest and activity that form their lives (Carver and Scheier, 1998; Scheier and Carver, in press). The same is true of shifts in goals and values that are more drastic, yet still occur within the structure of the self.

Without such recalibration and multiple paths to core values, people would never be able to make it past hardships and traumas that leave permanent changes in their lives. If commitment to goals is not rekindled, the result is a psychological and behavioral emptiness. There even is reason to suspect that such a state might be implicated in premature death (Carver and Scheier, 1998). Purpose in life is critical to continued wellbeing (Scheier and Carver, in press). And purpose in life is sustained, in part, by the phenomena of response shift.

**Acknowledgements**

Preparation of this article was facilitated by support from the National Cancer Institute (grants CA64710, CA64711 and CA78995).

**References**


