

# MINUS FOR SOME

■ STEVE GALLOP, O.D.

## Abstract

*Lenses change the directions to the brain. It is possible to provoke changes in behavior and performance with the judicious and dynamic use of lenses. Low power concave lenses provide another tool for helping children with learning differences. They can provide the substrate for learning to make better use of various aspects of the visual process. These lenses can be instrumental in stimulating more effective interaction between central and peripheral processing. They can also stimulate the ability to sustain attention.*

## Key Words

*myopia, nearsightedness, low minus, peripheral processing, central processing*

I well remember the inscription on Dr. Robert Kraskin's retinoscope-holster/belt; PLUS FOR ALL. This slogan referred to the notion that every individual would perform with greater comfort and efficiency if they utilized the appropriate near lenses. Kraskin often referred to such lenses as "counter-stress" or "stress relieving" lenses.<sup>1</sup> The judicious use of low-power convex (plus) lenses has become a cornerstone of my patient care philosophy and practice.<sup>2</sup> However, some time ago I began using another tool that is best described as MINUS FOR SOME. At first this approach seemed contrary to much of what I had come to understand about a behavioral approach to vision. Nevertheless, I started employing it during office visual training (VT) and then prescribed low powered concave (minus) lenses for a certain group of patients.

They are characteristically over-active/under-focused youngsters. These children are usually referred to me because of difficulty with school performance. Their problem areas include below expected performance in reading and/or handwriting, and an inability to complete work in a timely fashion. The majority of these children also have great difficulty with productively and appropriately maintaining attention; asthenopic complaints are not uncommon.

Children are typically given poor advice regarding how to employ the visual process in an efficient, comfortable and flexible manner when dealing with the stressful demands of the school environment.<sup>3</sup> Usually, early in their school careers, children are taught that to properly attend to and complete a task, they must devote undivided attention.

They must block out everything except the task at hand. The need to approach a task in this manner assumes at

least two negative characteristics: 1) there is an inability to maintain an optimal relationship between figure and ground, and 2) there must be an excessive level of effort to complete even the simplest task. This thinking leads to negative behavioral changes such as a consequent reduction in peripheral awareness. This in turn can promote reduced flexibility in problem solving by fostering a rather narrow view of the task. All of these behaviors serve to increase levels of visual stress.<sup>4</sup>

Visual stress is often described as being related to nearpoint activities.<sup>5-7</sup> However, this is only one aspect of the stress put on the visual system.<sup>8</sup> The importance of reducing visual stress lies in the notion that stress causes individuals to actively (consciously or otherwise) reduce the amount of visual space with which they routinely interact.<sup>9,10</sup> As performance becomes more strained, there is a tendency to reduce the amount of information a person consciously acknowledges.

Suppressing this information seems to make the task easier, but this leads to a cascade of adaptations. These adaptations which include myopia, hyperopia, astigmatism, strabismus, accommodative disorders tend to become global behavior patterns. This leads to a reduction in comfort, flexibility and performance.<sup>11-13</sup>

I have spoken with a number of clinicians who contend that hyperactive children are "too peripheral," meaning they cannot focus on specifics. The thinking is these children attend to everything and are unable to appropriately use central (or detail based) processing of information.

I prefer an alternate, albeit opposite explanation.<sup>4</sup> (p.20) *These children are unable to appropriately utilize peripheral processing. Consequently, all information takes on central importance since ground is not being accurately processed.*

*Thus, the relative lack of peripheral awareness leads to a lack of context.* And, everything that enters conscious visual awareness becomes a curiosity and the object of absolute interest and attention.<sup>7-9</sup> In this context, the teachers' and parents' admonitions to "concentrate on this, and ignore everything else" can exacerbate the very situation it seeks to eliminate. Patient education, VT and plus lenses can be employed to foster an expansion of peripheral awareness in order to increase the ability to be appropriately aware of the surround.<sup>4</sup> (p.19) However, this must be accomplished while still maintaining the optimal level of central (detail) task performance to be successful in school, and, in fact, all visually guided activity.

Thus, my advocacy for the use of minus lenses for these children apparently contradicts what was just stated. This is definitely a concern and is why I never use this approach with anyone who has not been successfully treated in a VT program that included counter-stress lenses. Counter-stress lenses are those lenses found to yield both objective and subjective improvement in performance. In my experience, these are always low-power plus lenses. Recall Kraskin's caveat: PLUS FOR ALL. The lenses and visual training support each other. It is difficult for me to conceive of visual training being done without the support of proper counter-stress, near lenses.

The children in question have all been involved in active VT for several months. In my judgment none of these children require lenses for distance. They all have been using low plus lenses for the majority of their indoor activities (in school and at home) as part of their training program. However, even with scholastic and other gains that can be ascribed to the total optometric intervention, these children continue to exhibit considerable difficulty in maintaining appropriate attention on the task at hand. They have improved in this area, but not enough to satisfy our goals.

These children have frequently received a label that places them on what Lemer has termed the Autistic Spectrum<sup>14</sup> and some type of psychostimulant medication, such as Ritalin, is frequently prescribed.<sup>15</sup> I am convinced that the protocol of VT and lens prescriptions I use for these children is a viable alternative to medication.

## **Using Myopia and Nearsightedness Properly**

Myopia is a style of behavior involving a reduction of peripheral awareness; there is a tendency to be more analytical, more sedentary, and more often than not nearsighted.<sup>16</sup> I am defining nearsightedness as that refractive state that requires concave lenses in order to achieve 20/20 distance acuity.<sup>5</sup> Myopic behavior can lead to an increase in nearsightedness, and vice versa. We all have a little of the myope within us and, in fact, must utilize this mode of behavior to some degree when we do close work. This is precisely the ability I hope to stimulate with low-powered minus lenses. When this ability requires minimal effort and is part of the individual's standard repertoire, the potential for adverse, chronic adaptations is reduced. Then, the overall flexibility, comfort and efficiency of performance are enhanced.

One reason a person becomes nearsighted is an inability to easily switch into the myopic mode as circumstances demand. There are times when each of us must access this visual behavior pattern. A task may seem to demand our complete and undivided attention; it must be completed within a specific period of time. We must focus in on the task and minimize interference from all distractions for a while. If this maneuver is difficult to make, we must adapt. We are frequently required to make this shift in our lives. It becomes important very early in the school years, and becomes paramount in the work environment. If there is difficulty accessing and releasing this mode, we must adapt.

A possible adaptation to this scenario is to become nearsighted. The individual is able to make the myopic shift, but with excessive effort and accompanying discomfort. He resolves the issue by moving into more habitual myopic behavioral mode than previously. However, the consequence is an inability to return to the original less myopic state. Thus, the stage is set for permanent nearsightedness. If a compensating prescription is provided at this point, the nearsightedness is likely to become permanent, and to progress. There are other ways to deal with this type of situation, but that is not the focus of this article. In my experience, those who become permanently nearsighted and myopic are typically less likely to find

themselves in the category of the children being addressed here.

## **Rationale**

At the outset, or shortly thereafter, virtually all my visual training patients are prescribed low-power plus lenses for near. I will typically determine the power of these lenses by a combination of stress-point retinoscopy<sup>1</sup>(p.25) and the repetition of several performance probes with the counter-stress lenses in place. The power of the lenses is also dependent upon the total picture of the person. That is, their historical and current refractive status, the level of comfort provided by the proposed lenses, their daily needs, and the benefits that are anticipated. These lenses have several effects that bear mentioning here: there is a degree of magnification, there is reduced accommodative effort required, and the distribution of light is expanded across the retina. I propose that all of these effects help to counter visual stress.

The effect of minus lenses is essentially the opposite of that of plus lenses: There is a degree of minification, there is increased stimulus to accommodate, and the distribution of light is narrowed across the retina. Minus lenses constrict the useable volume of space: the virtual image created by a minus lens is reduced in size and is displaced closer in space. Therefore there is a three-dimensional compression of information. It is important to mention here that these are optical properties of the lenses. As with any lenses, the main issue is the person's response to the lenses; these are not nearly so concise nor are they entirely predictable.

As discussed above, I felt that the population in question required aid in focusing on the task at hand and maintaining attention. I then hypothesized that low-powered minus lenses might be an appropriate agent. I cannot overemphasize the fact that all candidates for this regimen were actively involved with both visual training and counter-stress lenses. Some level of improvement in overall performance had already been reached prior to implementing low-minus lenses in the manner discussed. This provided a foundation that was both strong enough and flexible enough to benefit from minus lenses with little risk of "absorbing" the lens<sup>16</sup> and then moving into myopia or nearsightedness.

Those experiencing problems with attention, who have been otherwise successful with therapeutic plus lenses and VT, are good candidates for therapeutic low-minus lenses. The implementation of low-power minus lenses may provide the individual with an idea as to how the move to access the nearsighted mode is made. The low power of these lenses helps this move to be made gently and subtly. This is likely to make it easy to get into, and out of as well. With a little practice the person may better understand how this is done. This will enable her to access this mode more effectively on her own. Higher power minus lenses provoke a shift of their own. However, this shift is more difficult to make, and more difficult to release.

Low-power minus lenses gently modify the distribution of light on retina. This provides the visual system with an opportunity to observe something new, and to learn new means of coming to terms with certain types of visual demands. As with all spectacle lenses, there is a four-dimensional distortion of space/ time. This is just as true of a low-power lens as a high-power lens. While the distortion is likely proportional to the power of the lens, it is no less real. Neither is it less important to be kept in mind. It is quite possible that this distortion contributes to the positive effects seen with the use of low-power plus lenses. This would also be true with low-power minus lenses. Another important factor is that people are not optical benches. While the optics of lenses may be considered to behave in a predictable, linear fashion, the same cannot be said of people. Light is transformed by a lens in a consistent way. A given individual's response to this transformation is much less predictable. The individual's response is the primary issue. The proper foundation, provided by appropriate near lenses and/or visual training can increase the likelihood of a therapeutically desirable response.

As usual, the problem arises when such a behavior pattern is misused, overused and/or, becomes chronic. Chronic nearsightedness often begins as inefficiency in becoming myopic, or behaving myopically at the appropriate time, for the appropriate length of time, and in an efficient, effective way. The inability to shift into, maintain, and/or shift out of this mode may cause an alteration of the base

setting, or default, of the system.<sup>3</sup> Let's take the inability to access and sustain near accommodation as an example. If this posture cannot be easily maintained it may be subconsciously decided, one day, not to let go of it. The default will then be shifted in the direction of nearsightedness and/or myopia. When the default is permanently shifted there is a reduction in overall performance, comfort, efficiency and flexibility. Once such changes occur, they become the norm. These changes may not be consciously appreciated since they occur somewhat gradually. Therefore, what seems comfortable and effective is altered.

Again, this situation is not inherently bad. It is, however, less than optimal if it is avoidable and if it does not result in a global improvement. It is important to avoid any move away from symmetry. We function best when our default provides the greatest symmetry. This is the place from which we have the greatest flexibility to move in any direction, with the highest level of accuracy and comfort.

It is clear that there is some benefit derived from even adverse adaptations. They would be less likely to occur if they did not provide either task-specific or short-term relief. I have since come to the conclusion that for me these adaptations probably enhanced my ability to attend and process. To this day I would not claim to be the most focused individual, and I believe that the introduction of minus lenses into my life had no small effect in reducing my over-active-under-focused behavior. I bring out this point so we might consider the possibility that if there is the unwanted side effect of creating some nearsightedness and/or myopic behavior, that it may not be the worst thing in the world for these particular children.

Undoubtedly, I would feel more comfortable creating a long term dependence on minus lenses than on Ritalin or the other drugs that are being used as substitutes or adjuncts. This is not to say that I find this in any way desirable. My hope is that this will not happen, and that the temporary and precise use of these lenses will stimulate internal changes in behavior and performance that will outlast the need for any minus lenses on a permanent basis.

### **Clinical Applications and Implications**

I began by using either -0.25 (frequently) or -0.50 (rarely) lenses for brief,

specific activities in the training room. The thinking here is to use the power of lenses in what I would describe as a homeopathic way.<sup>2</sup>(p.130) That is, using what might normally seem to be a clinically insignificant amount of a substance, in this case a lens, to bring about significant clinical results. Homeopathy also uses "like to treat like." In this case I am using a lens that optically reduces periphery and stimulates the need for accommodation in what I can best describe as a homeopathic way. The results were excellent and consistent.

Virtually all of these children showed enhanced ability to stay with a task as well as improved performance. This occurred on repeated trials. Because of the experiences in the training room, I decided to prescribe these lenses for each of these children.

My instructions for the use of these lenses are very specific and include a warning of the possible adverse side effects if instructions are not followed. It is possible that constant use of minus lenses can lead to increased nearsightedness. This notion is supported by clinical experience. There are many people whose nearsightedness increases steadily once they begin to use compensating lenses habitually.

Conversely there are many whose refractive state remains fairly stable without habitual compensation. When I first decided to prescribe low minus for use outside my office I simply had the child wear the lenses for the first 15 minutes of homework. At first, the reports that came back from parents were encouraging. They noticed an improvement in ability to focus attention with the recommended wearing schedule. Other changes were reported, such as better overall memory and improved handwriting. Again, I feel it is important to stress that all of these children had already experienced considerable positive changes due to vision training, along with the use of nearpoint lenses. I stress this point because I feel it is critical for a person to have a higher level of visual flexibility, stamina, and comfort before using minus lenses in this way.

After the initial findings and subsequent feedback, I decided to attempt a more precise and comprehensive approach. I tried to select times of the day and/or situations that would benefit from the kinds of changes I was seeing in the

training room. That is, those times where there was a need for improved focus for discreet purposes. I therefore recommended that the glasses be worn for no more than 15 minutes at a time, four times a day as follows:

1) At the start of the day while preparing to leave for school. This is a time that requires focusing on a precise task - getting ready to leave the house on time for school. This task involves movement and temporal/spatial planning.

2) At the start of homework. This task requires focused attention, and the need to come to terms with nearpoint demands. These demands are more challenging after a full day of school. The minus lenses help stimulate the near shift and may provide a kick-start for mental focus.

3) While watching television with the addition of some nearpoint task such as drawing, coloring, puzzles, building blocks, copying some written material, etc. This requires attention of a different sort. Most children spend part of the day in front of the television and there is little doubt that their attention is focused on the set. I have included a distracter to pull focus away from the TV intermittently, with the addition of a near task requiring motor involvement and some cognitive input. This encourages the ability to deal with more than one demand simultaneously while at the same time stimulating the ability to access mental focus.

4) The last thing before going to bed. This is another time that requires focusing on a precise task of sorts - preparing to end the day.

The overall results might be even better with more motor involvement or with the addition of greater spatial demands. However, my primary concern was keeping the wearing time strictly controlled.

This regimen should not interfere with the regular wearing of near lenses except for the brief sessions described above.

The minus lenses should be kept at home to avoid misuse. It is my feeling that we do not take lenses as seriously as we should. We can successfully use lenses to treat functional pathology, and should therefore consider them to have a kind of medicinal value. Even though lenses are "taken" externally they do provoke responses in those wearing them.<sup>2</sup>(p.130) Those changes are often global in nature. That is, the effects can be quite

far-reaching whether intended or not. There can be subtle effects on a person's overall comfort and energy levels especially when there are heavy daily visual demands. There can be effects on how a person perceives space, and on what kinds of activities a person feels confident doing, or has interest in doing.

I have not found a simple way of determining the length of time that a child should continue this protocol. I recommend careful monitoring of overall performance to guard against any further undesirable adaptations. We especially want to avoid disturbing the protective hyperopia and exophoria if they are still viable. Under proper conditions these lenses should be safe to use until the desired changes have taken place and hopefully stabilized.

### Conclusions

I believe it is generally challenging, if not biologically unacceptable, for a young child to focus at length on a task, especially when the task is truly only important to someone else. It is also biologically unacceptable for a young child to remain seated for long periods of time under similar circumstances. These two issues alone could account for much of the difficulty seen, seemingly more and more, in today's youngsters. Another problem is that the television-based culture significantly reduces attention span by blasting children with rapid-fire image changes and sound bites. Today's children need all the help they can get for maintaining adequate, effective focus. I am referring to mental/physiological focus required to keep up with school-related demands. Low-minus lenses can help some children deal with these issues more effectively. Nothing works for everyone, but I am convinced that any child who benefits in this way from the careful application of minus lenses is going to be happier, healthier and more successful in school. This may be especially important for those whose parents are opposed to using severe medications for a school-related problem.

Low-power concave lenses might provide another tool for helping children with learning differences. We do not all learn the same way, but most of us are required to attempt learning in the same type of environment and at the same speed. Placing children in these circumstances means that they are forced to learn within a narrow range of parameters. Such con-

ditions are bound to create difficulties for a significant number of individuals. This number is growing at an alarming rate. Behavioral optometry has always had the ability to exert a positive influence on these types of situations. The technique presented here is well suited to the current situation with which so many families are now faced. As with most techniques within behavioral optometric care, it is relatively easy to provide, and is almost totally risk free.

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Corresponding author:

Steve Gallop, O.D.

7 Davis Lane

Broomall, PA 19008

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